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LET'S HEAR AND TALK TO THEM

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It is always sad when man leaves this world. It is understandable – diseases, age, accidents, natural disasters. You can blame fate, circumstances, Lord, but apparently such is your fate.

I do not understand when man is gone by his own wish, with his own hand cuts off such a tiny Ariadne's clew. How to consider the person who has done it: is he a hero not afraid to overstep a step leading only to one side. Or is he a coward who has chosen an absolutely quiet way out of the situation – I do not exist any more, let it be the Flood after me. Relatives and surroundings remain deceived – the dead do not help to fight with the lack and hardships. We lose one more member of the society. A deserter. How else can he be called: everybody sweat their guts out and he is lying blessed in the candle light. We can always find an excuse or condemn. To my mind the most important thing is to understand. Maybe it is not so difficult to part. After all when you leave for a trip don't you often think about never meeting again, parting forever? So – lots of travels, travelers, reaching new lands and lots of the missing. If we consider it deeper there are lots of the missing, but they may consider us having gone out of their world.

Nevertheless a suicide is an extraordinary event. And not only in the existence of an individual. In the community, society. The event which makes us stop, think, check up our behavior, look for mistakes both in the dead person's and our lives. No matter how we talk, this exit by one's free wish shocks us. None of the left messages brings light to the brutality of the behaviour, maybe only enables the prosecution and

legal institutions to finish the investigation of the event. Depths of the soul remain dark and the suicide remains all by himself.

As a title of this report I have chosen a paraphrased title of Almadovar's film. We need to speak. To talk. Most of us are lonely, alone with our problems which are most important to us. We have a wish to tell them, to partially transfer our burden onto other people's shoulders. Just at least for a while. But usually we do not hear the call of those asking for help. We ourselves shout, wait for help. In such a way we get drowned in the sea of shouts, chaos in which we do not see any sense. And we neither receive nor provide any help.

Recently there is even abundance of us on the Earth. More and more we dive into the virtual world from which we surely will receive no help. That is why I liked the title of the film – let's talk, let's hear one another. Let's do just this if at present we are not able to help otherwise.

This problem - of those gone out of this world - is global as it is fashionable to say. It has become global. In many countries more and more people commit suicide and the statistics is quite impressive. Both in the USA and in Lithuania people commit suicide by 1.7-2 times more than those who die from violence: in motor transport accidents, killing, drowning, burning. 10 times more often somebody is trying to commit suicide than coming. So annually in Lithuania 1500 people commit suicide and 15 000 try to do it. About 17 000 people per year – less officers serve in the police.

Globalization of suicides makes us consider the reasons, encouraging and provoking such an action. If there were only one reason it could have received a "deadly" blow and only failures who can not distinguish between existence and non-existence would commit suicide. Apparently a lot, complex of reasons exist, the whole of which causes such a shocking reaction. And there is a specific complex and unambiguous reaction for each individual.

In this report I would like to discuss a number of reasons the examination of which might help to reduce the tension, helped to find time for the analysis of the situation and a more optimistic way out. These are not reasons in the narrow sense of the word but complexes of reasons which more or less influence the number and increase of suicides. I'd like to emphasize one more thing. We should see more optimism at the end of the tunnel, not only black gaunt hopelessness and no way out of

the situation. Let's create a ray of light, belief, help, the help and consolation of a listener and companion.

DALGEI
(Depression–Alcohol, drugs–Genetics–Endocrine system – Immunology)

The human organism is a wonderful instrument which consists of well balanced interdependent systems: nervous, endocrine, immunologic the formula of which is transferred from one generation to another. Without going deep into specific things it can be stated that even smallest disorders of one system, a squeak in interteeth immediately respond to the functions of all systems till at last the whole organism starts slipping. All the systems are most easily infringed by alcohol and drugs, as the result of this psychic disorders, depression and as the last stop – a suicide attempt or suicide comes. There is much space for optimism – self-education, lectures on healthy way of life, etc.

SEX

Two organism functions exist in the development from unicellular to the human being: to protect from the damaging and killing environmental factors – assailants, diseases, traumas, to feed oneself and secondly – to prolong the life of your tribe, race, family. At different stages of the evolution it is done individually. Sex plays an important role in man's life. If the animal's sex is only prolonging of the species, man gets satisfaction and earns money from sex. A broad sex industry flourishes, and on the other hand it stimulates gales of spiritual strength. During different periods of the development of humanity various tendencies prevailed: matriarchy, mono-polygamy, orgies of sex gourmands and periods of total asceticism. A sexual explosion, sex revolution began hardly more than fifty years ago, but much has been achieved. In Russia a law legitimating marriages from 14 years of age is under preparation though sexual intercourse under 16 years of age is defined by articles of the Penal Code.

Sex is in a tight relationship not only with external sexual organs but also with psyche, its fluctuations. Since early times dramas and tragedies provoked by sex or appearing as a result of sexual games are

known. It is the sphere where in order to protect psyche sexual education (including both contraception, abortion and hygiene), sexual education on the sex par basis can be of great use. One of the sexual deviations is known as sexual aggression. Beginning with paedophilia and ending with gerontophilia, necrophilia and sexual maniacs. The sexual spark long and strongly smoulders in man's psyche uncontrolled flames of which can burn not only the master but also the surrounding people. It is possible and sex should be subjected to creative power, not to destruction. There are all possibilities for this.

CRISES

Factors throwing man off balance are observed not so rarely. According to the data of many authors up to 20-30% of people experience negative emotions which if lasting for a long time can destroy psyche. The most common causes of crises are conflicts at home, school-university, work. We happen to meet people who go to work, schools as if they went to servitude. On the other hand a constant fear to lose a job also adds to damaging people's health. Delinquency among the unemployed several times exceeds that of the working people. Frequent certifications also increase the tension at work which on the one hand should encourage the staff to improve their qualification. But frequent control and dismissal from work only causes an unnecessary tension and the employees' squinting at one another: when and who will be dismissed from work. There are few staffs in the relations of which a tolerant spirit is preserved. Man spends one third of his life sleeping and half of his life working. An expression of a nervous work – usually restless, unqualitative sleep. When it is bad at work, it is even worse in bed. When you get up weary – the work is failed. And this repeats every day. The way out should be found not in tablets.

AGGRESSION

Anger, aggression, violence are apt to increase in the world – their roots are somewhere and they poison people. Excessive promotion of leadership, boom of consumer society divides people into those able and unable to purchase and acquire things. It requires much gold but contrarily to aggression it does not increase at such a rate. It is necessary to re-

distribute it. And it is redistributed not on the socialist background – equally to everybody. The one who is stronger, nimbler, impudent. There is no time for work. The genes of aggression are considered to be found. So the structure of behaviour does not depend on us anymore. Or nevertheless corrections are possible?

WOMEN – CHILDREN

Improvement of means of transport has not only expanded our outlook, saved time but also has turned the other side. From the northern hemisphere sex tourists have invaded the countries of southeast Asia. Pedophilia has become a universal phenomenon (has become global?) The women trade is more profitable than the drug trade. Sexual abuse of women and children as the source of profit has overstepped all the limits on the Earth. Dissertations are being written about violence against children, uncanny documental shots are being showed. Attacks of violent aggression against the one weaker who can not defend himself – one more manifestation of hopelessness?

SOCIETY

During the recent century so many things have happened, everything developed so rapidly that the ties which formerly seemed to be eternal started breaking. Two world wars, communications, flow of information have loosened a former life routine. If several thousand years ago nations' move took thousands of years, now it is a matter of hours or days. Religion, languages, customs, gastronomy has turned into the tower of Babel. Sulky refugees, sulky masters, suddenly even symbols of belief revive (in the XXI st century). Just listen how the words – genocide, holocaust, globalization sound!

GOVERNMENT

Even if repeated 500 times that the government should help people, not on the contrary, our mentality does not change – you elect the government and serve to it. You make a totem and serve to it and make it your idol. And you grow such horns to the government that you can not make yourself understood. Maybe the time is difficult in the global context but the notions – a nation, patriotism, solidarity -survive. And you

think – are all these notions are still meaningful, do masses of people, citizens still gather around them like around the flags? The government as the wheelman should turn the state between Scile and Charibde. For this it is given the pilot's authority. The police, army, prisons are only parts of the repressive structure or maybe they are part of our essential consciousness and existence?

RELIGION

Isn't it too early to bury religions? Who buries them? Man is weak, he needs to believe in something, to console to somebody, to expect pleading, to obey, to wait for a miracle. If the miracle does not happen, it is possible to create it. As it is possible to create the idol itself, whom you can wash out your fallacy, sins. If science is not able to prove the truth about the existence and nonexistence of God, it is possible to think of your own sect and to worship a god acceptable to you. The problem is that after having established a sect there is a wish to make it global (?), i. e. rich. This is the cause of all problems. Earlier people were looking for God in solitude or desert, now – in a purse. Most of old religions did not adapt to the jumps of time and practically the aim of a majority of sects is one – to get a bigger piece of the pie from people's credulity.

EUTHANASIA

An eternal question of life – what is alive and not alive, who has a right to deprive somebody of life, is it possible to create and destroy it. The technology having reached such an impressive level that it became no problem to create homunculus in a bulb. It is possible to make a clone, to call a murder euthanasia, to invoke palliative therapy, to change sentence to death by life sentence, to have abortion, to raise a five month-old embryo – foetus in an incubator. We manipulate with life like a little child with a toy?

DISEASES – tuberculosis, AIDS

We frighten ourselves and others with the God's punishment, plague, hunger and war. When we have defended ourselves from many diseases, still several of them have been left which are able to take to the cemetery lots of people. Somehow we have chosen AIDS – 40-60 mil-

lions of people are ill with it. Impressive numbers but every third inhabitant of the Earth is contaminated with tuberculosis. And there is silence. If you catch AIDS in definite ways, though connected with risk but chosen by one's free will, you can catch the tuberculosis parasite anywhere – in a bus, street and without any wish. 55 people in Lithuania are ill with AIDS whereas there is an epidemic of tuberculosis. And there is silence again. Nothing. You can consider tuberculosis to be a shameful disease whereas it is honourable to be a gay or drug addict and of course you are supposed to get all the compensatory medicine. Maybe it is cheaper?

TERROR

We can hardly remember such a scale of terrorist acts, even if there were any (during the war they also called themselves terrorists, bandits, partisans).There have been not few of them, but it was war and "in the war it is as in the war". Thousands of people, peaceful inhabitants – children, women- it is new. You are rich, I am not. It is the only motive. Redistribution of riches again without taking into account lives and measures. The flag of Islam is being raised, but is it really so? A thousand years ago Europe was redeeming The Christ's coffin from the failures, and now giaours are being offended?

PRESS

They called themselves a watchdog. But watchdogs must defend not to bite from an ambush. They call themselves the yellow and other press. If it is yellow – no brakes exist! Not yellow – the same. The more and more impudently you are robbed– the bigger is the honour to the robber. We can not say that there is no mutual agreement – between the interviewing and interviewed. More noise, publicity and selfpublicity. If we just think a bit of the responsibility, it is not a far off past when American victory marches were heard through detector apparatuses freeing Lithuania, when due to disinformation – it can not be called otherwise – the nation has lost thousands of heads. Who has apologized because of the shame, who has shot himself because of the grief? At least after 50 years? An example how mass media forms consciousness, habits and way of life can be found over the seas. The power of publicity is enormous. Some people get annoyed by it in the middle of a basketball

game, but during several years we have got used to it as we got used to inevitability of drugs. Again this lively intervention of mass media into our life. It also needs a curb. Not a censorship, a curb: let it bark but not bite.

GEOGRAPHY

Geographic medicine exists. It cures diseases connected with climatic conditions. It can be of two sides – man is born in some spot of the Earth. Geoclimatic conditions are characteristic only to that place and that life. It develops, grows, mature in certain surroundings. Among its own temperatures, parasites, with its own Sun, stars which always appear in their due time. The move of nations continued for hundreds and thousands years, people were changing their living places, habits and customs. Now it takes us just an hour to cross several time zones and get back after some days. The inner mechanisms of our organism have a lot of reserve if they manage to endure such natural disasters. We rarely think about it, and even more rarely adapt to the circumstances. We live so – half-lamed.

CATASTROPHES

No matter where we live – we are part of nature. We have got used to its caprices, have adapted, sometimes we painfully suffer. Drought, floods, fires, earthquakes, tsunamis, volcanic eruption – all of them are nature's jokes which though making a lot of trouble are corrected and compensated by nature itself. Banks of the Nile in flood become fertile laboratories of the growth of civilization, hundreds of years after the volcanic eruption the ground becomes more fruitful. But man can't stop fidgeting and the jokes of nature are not enough for him – he not only creates such surroundings which threaten to destroy him but tries to infringe it itself. Chemistry, radiation, the effect of the hothouse, ozone holes above our heads – this is only part of the apocalypse of which we are threatened by real and unreal heralds. God, let them be mistaken.

And in the center of all this there is a man. How not to get crazy. How to survive. Oh, yes – some do not survive. They get frightened and run away. Listen to the frightened, talk to the lost. You will calm him down and you will feel calm. It is (so) and it will be so.

DENGIS

Depression-Endocrinological-Nervous system-Genetical-Immunological-Somatic problems

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World is very complex. We in it are complex too, while the interrelations between two complex systems are even more complicated. Therefore the outcomes of these relations are unpredictable and frequently tragic.

We are using the term of stress too frequently. There are a great number of stress definitions. Some define stress as positive, some – as negative. Sometimes stress is described as a mean to maintain the normal status of the organism. When unpredicted sudden changes of environment, which change our statuses, sometimes not reacting to changes properly and as result – perdition. Sometimes the lack of stress evokes such quantitative as well qualitative changes in our internal systems that this condition also leads to death.

So the conflicts between organism and surroundings are constant. There is one outcome. We know such branches of medicine and science as geology, geography, space, astromedicine and biology. Environment is creating us, formatting us, we are reacting to the chemical, physical fluctuations. Our organism is also made of chemical and physical elements. From the purely mechanical point of view this is very normal coexistence of different systems. However from the biological point the situation is more complex and contradictory. Let us schematically imagine our organism as an element of the periodic table of Mendeleyev – without theological or materialistic background. The nucleus of this element could be genetic information. However the naked genetic information could not exist. It must form around it a shell, some kind of

mantle. The more complex become this informational seed the more competitive it was the its surrounding. Different systems and structures have formed around it producing more beneficial conditions for multiplying and proliferating primary genetic codes. So organisms developed forming new layers as nuclei forms electron orbits or onion its leaves. So chemical-endocrine, chemical- immune, nervous systems such as blood, respiratory, digestion units, which made this formally accepted object – living organism, were formed. At which stage of nervous system development evolved psychical processes it is not clear yet, while the debates are still very active.

In the course of million of years these systems ideally adapted to each other. In heavy circumstances they back up one another in compensatory manner. But when internal recourses are depleted then the failure of one system probably will lead to the death of whole organism. Human being, which also possess psychical abilities, is able not only die, but to kill himself as well. This is one of the strangest and hardly explained abilities of a man. There are no known cases of return from the Heaven with tales about bright and nice living after death. But nonetheless this irreversible step is frequently being taken without any even slightest possibility to return. Without according understanding the suppositions and contemplations begins trying to explain the causes of suicide, the hypotheses and theories are being proposed seeking to minimize the number of suicides. This problem is very actual in Lithuania, which, according to figures of year 2002, occupies the first place in the world with the number of suicides per 100 000 inhabitants (44,5/100 000). Around 1500 people commit suicide every year – a small town disappears from the map of the country each year. Therefore this problem is eagerly discussed and raises sincere concern of specialists working in the sphere of health matters. In this chapter we will study the difficulties of dealing with multifactorial problems like this.

It was mentioned, that all systems –psychic, endocrine, immune, genetic, nervous are very closely interrelated, their functions being interlocked. If any of these systems are damaged, all other systems at some extent are affected too. If aggressive factors are active not very long period then the damage can be unnoticed. Unfavorable factors with more prolonged action can disorganize not only behavior, psychic, physico-chemical parameters, but also influence genetic, the most fundamental factor of existence of all living organisms.

The changes in somatic, bodily functions can change psychic processes and vice versa. And if the evil circle forms then this uncontrollable situation can lead and to suicide.

In this chapter we would like to review:

1. somatopsychiatric and psychosomatic disturbances of the organism;
2. endocrine system changes as a result of psychic disturbances;
3. immune system changes, which can damage not only psychic, but also other organs and systems;
4. genetic structure conditions, the equality of human life, but genetic code can be broken by internal as well as external factors;
5. human behavior, especially with the stress upon types of auto- and egzo-aggression, modified by features of internal structure of immune, neural, endocrine systems, genetic code from one side and education, social environment et cetera from the other;
6. to try to evaluate all changes occurring due to external and internal factors (stressors) and to try to find counter measures against unwanted negative outcomes.

PSYCHOSOMATICS

Almost all known illnesses can be viewed from the point of psychosomatic-somatopsychic disturbances of the organism, depending on which, almost inseparable part of the duality – soma-psyche –is affected most, and which reacts to the disturbance. Accordingly all internal and external fluctuations are the effect of reaction of the organism to the stressors, to the stress.

In this part we will try to discuss in general the changes in central nervous system, circulation, gastrointestinal and other systems after the influence of external and internal factors, which led the soma and the psychic out of balance.

Maybe the changeability and vulnerability depends on that “we deal with an organism equipped with a number of primitive, subcortical mechanisms designed to ensure survival in the jungle, and a higly differentiated cortex which is neverthless unable to inform the subcortex that we no longer live there“ (1).

Physiological response to stress, i.e. stimuli, is dual: fight or retreat and timely, swift choice between them means survival. Man under the

stress feels nervousness, inertness, insomnia, palpitation, hand tremor, sweating. The head is aching, persons become agitated, nightmares can be present. The simple autonomic reactions can be understood with the help of authors (2), who report that the structures of CNS, such as amygdala after multiply stresses changes even anatomically. The hypocampus – the CNS center for learning and memory – diminishes after chronic stress. The importance of this part of the nervous system could be defined so – hypocampus takes part in the memorization of such type of information: where have you been and what you were doing last week on Tuesday afternoon? On the contrary, amygdale, the other very important CNS structure, is responsible for the emotional (positive or negative) background of your actions.

Under the influence of the stress the number of dendrites of nervous cells in hypocampus is decreasing and as a result there is decreased exchange of information with the other parts of the CNS. On the other hand, the neurons of amygdala are burgeoning, the density of dendrites is growing, amygdala grows in size. For instance, in the case of prolonged depression the amygdala's activity is increased, while hypocampus activity decreases. As a result, the probability of onset of anxiety, fear and anger is rising, while parallel hyperfunction of hypocampus distorts perception of reality. So the anger and anxiety generalizes – every stressful condition can evoke generalized outburst of anger and aggression. The decrease of hypocampus and increase of amygdala as a result of stress were found using MRI technique (3). This can lead to various psychiatric disorders: bipolar disorder, Cushing syndrome, posttraumatic stress disorder, personality disorders (4). Even during positive emotional experiences there are noticeable changes in CNS structures, neurons become hypersensitive (5). It was also noticed that persons with posttraumatic stress disorder have diminished one of the centers of emotional control - cingulate anterior cortex (6). The increase of concentration of shock proteins also indicates that brain under the influence of chronic stress is morphologically damageable (7).

Morphologically damaged brain produces mind disorders. Stress-dependant changes of ionic, metabolic and haemodynamic balance regulating systems can lead to depression (8), panic attacks, posttraumatic stress syndrome (9). Glutamergic mechanism can play important role in schizophrenia development (as a result of disregulation of dopamine-glutamate interrelations and deformation of hypocampus) (10). Mind

disorders can be paralleled with behavior disorders, especially among adolescents, when the frontal parts of brain are damaged as shown by recording lowered bioelectrical activity of these parts. These adolescents are characterized with personality disorders. Such behavioral problems may appear in childhood with later development into criminogenic behavior (11).

The heart is as important organ in the organism as is the brain, especially their tandem. When we speak about psychosomatics, we spontaneously are thinking about heart-mind and mind-heart bounds. Someone lives in the state of excessive emotions, while others demonstrate the prevalence of mind over feelings. This pair is inseparable. They also are affected by internal as well as external cataclysms. “The heart is the first functioning organ of the embryo, it starts to beat at 22-nd day of life, while the conducting system fully is formed on 13 day“ (12).

One of the results of stress action is depression. It appears, that even 40% of persons having cardiac disease have also the symptoms of depression. As a rule they are single, nervous, with sleep and concentration problems. As a fact, according to some studies approximately 30% of persons of 65 years old and older have depression, but only 1% are treated from it.

On the other hand depression can enhance the changes induced by stress in the CNS. People, who have depression, are caring less for their health: they are smoking and drinking more. There can be approximately 19 millions of people with depression in USA alone and only one third of them gets adequate treatment (13). People with depression have first heart stroke (infarct, MI) more frequently, while those, who get MI and develops depression dies faster (14). Depression causes disturbances of the heart rate and blood pressure. Depression is related to disorder of heart rate variability, which can lead to lethal outcome – sudden death. Especially older persons with depression have lowered blood pressure levels at nighttime (15).

The influence of stress upon cardiovascular system can manifest itself by changes in blood cells. These changes are marked in the case of this disorder. Blood cells play important role in the homeostasis of the organism, in the development of atherosclerosis, acute coronary syndrome onset, when the damaged subendothelial blood vessels intervene with altered plasma coagulation factors, especially thrombin. The worsening of the function of cardiovascular system among patients with de-

pression is determined by changes in blood cells reactivity as well as changes in 5-HTcells system (16). It was noticed, that after coronary blood vessels bypass surgery even 15% of patients did not feel any improvement. It was also established that 85% of these patients had depression, which in effect added to the worse postoperative results and early death (17).

Studies have shown, that among persons with hypertonic illness there were three times more frequent psychiatric disorders such as depression, anxiety disorders, recurrent episodes of anxiety-depression (18) Recently there was a suspicion, that emotional stress can be related to the mortality of patients with coronary heart disease (19). Interesting studies were carried out in Duke University, Durham, USA. Out of 225 doctors who were good students, active personalities, sought higher professional standards 14% were dead 25 years after graduation as compared with 2% from the number of average, students. This is a lesson of cardiologists- do not forget such a risk factor as personal features, especially active personality, i.e sympathetics. Sympathetic nervous system produces overflow of epinephrine and forces the heart to pump 20 liters of blood per minute instead of 5 l/min in normal conditions.

Hyperactivity of sympathetic nervous system frequently influences the rise of anger paroxysms (20). Paroxysms of anger, sudden reaction to stress 3 times increase possibility of hearth rhythm disturbances. The anger, which is induced by activity of sympathetic nervous system and catecholamines, secreted during stress, prepares an organism for the battle or retreat: blood vessels become contracted, heart works with overload and this create conditions for development of cardiovascular pathology (21). Anger, anxiety, related with disturbed function of blood vessels, enhances probability of cardiovascular diseases in postmenopausal healthy women. Women of psychological A type have more frequent anger reactions, higher anxiety level and depression as well as disturbed dilatation of blood vessels (22). There is one more aspect of stress as a factor of cardiovascular disorders: short periods of psychological stress prolong the removal of triglycerids, which have negative influence on the heart – during stress fat s metabolized slower (23). In addition, during psychological stress the interior layer of the blood vessels contracts and this raise the risk of sudden cardiac death. Psychological stress can also lead to dysfunction of endothelium (24). Such emotional reactions as sorrow, anxiety forces the changes of heart

rhythm, disturbances of humoral balance, activation of sympathetic nervous system. As a result we have diminished immune responses of the organism, enhanced risk of depression. Chronic emotional stress can 6 times more frequently raise the incidence of cardiovascular diseases, comparing to smoking, also increase cholesterol concentration or high blood pressure. Paroxysms of anger increase the danger of MI twice (25). It is supposed that emotional disturbances incline to anger paroxysms can be genetically determined. Along with prevalent inclination to heart disease in the family comes the higher possibility of death from emotionally determined hearth failure. The males are more affected because they frequently deny emotional stress (26). On the other hand females, which are nursing their ill spouses at least 9 hours a day have the heart pathology 2 times more frequently.

These women are exhausted physically and emotionally, which in turn gives rise to anxiety depression, high blood pressure, weakened immune system. Nursing of the relative or close person can cause severe emotional stress. Five main causes why women, nursing their ill husbands are at risk to their health and life are these:

1) they have no time to bother about their own health;
2) diminished socialization;
3) greater possibility to get diabetes, hypertension;
4) better conditions to start smoking, to greater amounts of “fast food”;
5) greater risk to start drinking (27).

WORKING STRESS AND ITS RESULTS

According to the data of American Stress Institute (http://www.stress.org) government daily looses around 1 million working–days because of stress (28). About 50 billions people in USA have hypertonic disease and this costs about 50 billions USA dollars to the government for treating this disease. The convalescence went slower when hypertonic disease was provoked by stress, stressful situations. On the other hand it was established that after MI, brain stroke, hypertonic crisis more quickly get well people of higher socioeconomical status, then ordinary workers. It is clear that illness is biological as well as social, economical and psychophysiological problem (29).

At the end of review of cardiac problems related to stress we would like to point out some factors:

A. Factors activating sympathetic nervous system:

1) medical causes – overweight, insulin resistant diabetes, hypertension, hereditary cardiac pathologies, sleep disturbances, anxiety, depression;
2) psychosocial and behavioral conditions – chronic stress, social isolation, smoking, insufficient sleep, diet disbalance, abuse of stimulants (30).

B. Psychosocial factors. 450 000 people die from coronary heart disease in USA and one more million gets ill every year. More than 100 billion dollars are spent every year for the treatment of this illness. Three aspects are pointed out:

1) medical prevention of the cardio-vascular pathologies (anti-smoking campaign, propagation of healthy life style, nutrition regulation;
2) stress and psychosomatics significance of psychological factors;
3) influence of social factors to cardio-vascular pathology (31).

It is very important to pay attention to psychophysiological factors because they have economical effects: the treatment of cardio-vascular diseases along with the stress-related problems is significantly less expensive (1228 $ a year) than treatment c-v pathology only with specific drugs (4523 $ a year) (32).

GASTROINTESTINAL STRESS-RELATED PROBLEMS AND DISORDERS

Did you notice when in stressful situations your guts make sound? Is it strange to you

when your stomach aches before the serious talk with your boss or employer? Scientists frequently indicate that bowels are the second brain (33): man has another central nervous system, whose primary aim is digestion. Nowadays the science of bowel's nervous system (BNS) is developing very fast, with special attention to its disorders. Only in small intestines the number of nervous cells reaches 100 million. Disturbances of the intestinal nervous system leads to such disorders as irritable bowels syndrome (IBS), which affects 20% of USA inhabitants and its treatment costs more than 8 billion dollars a year. IBS manifests

itself by diarrhea or constipation or combination of both disorders. It is believed that bowel's nervous system has developed earlier than CNS – digestive processes appeared before the locomotion or cognition. The main neurotransmitter of the BNS is serotonin and 95 % of its quantity in the organism is in bowels. By the way, in bowels you can find all neurotransmitters and neuromodulators, which are produced in the brain. One of the main functions of the BNS is regulation of peristalsis. i.e. to sustain constant series of bowels contractions from the stomach up to the end of large intestines. His is also called migrating motor complex (MMC). The small intestines have one more function – not to allow pathogenic m/o to move up from the large intestines in the direction of stomach. There are around 500 species of m/o living in the large intestine and if relatively large number of alien m/o will reach the stomach the existing symbiosis can be changed and this can lead to diarrhea.

Intestines are the largest immunologic organ of the organism having the largest number of immune cells than in other parts of the body. Aforementioned IBS pathology can be viewed as autoimmune disorder in analogy with multiply sclerosis, when immune cells attack nervous cells.

CNS and the nervous system of intestines are very closely interconnected, but only the bowels with their nervous system can have their independent opinion. The nervous system of the intestines can say "no" to CNS. There are numerous projections of nervous endings to the brain, but if CNS impulses do not satisfy the bowels, then they can be ignored.

The similarities of these two nervous systems mean that both of them can be susceptible to the same pathological processes or toxins. For example, in Alzheimer's disorder as well as in Parkinson's disease there are degenerative processes in both brain and bowels nervous system. Nervous cells of bowels and brain are affected similarly by physical, physiological and psychological stresses. Paradoxically during the treatment of depression with drugs, which affect serotonin system, the greatest side-effects are seen in the function of gastrointestinal system, where 95 % of all serotonin of all organism is concentrated. On the other hand, before reaching CNS, drugs encounter intestines barrier (34).

If one ingests an egg protein to the intestines, it produces allergic reaction – up to anaphylactic shock – as a reaction to alien protein. During stress the walls of the intestines become more permeable to various

substances. When egg protein is injected into intestines during stress, then the allergic reaction manifest itself earlier, more quickly and is far more expressed- it ends with anaphylactic shock. The starting stage of allergic reaction is diarrhea with excretion of salts, water (with injected egg proteins). When healthy bowels come into contact with egg protein, the local diarrhea is a reaction. However if the laboratory mice are in stressful conditions, such a diarrhea is far more expressed. In addition, the intestines of mice, which were under long-term stress are more sensible to neurotransmitters from nervous endings, which influence processes of diarrhea and spasms of intestine muscles. Enhanced intestines permeability provokes immune response. Antigens come to closer contact with the intestine walls. In the case of chronic stress, when immune system is already weakened, antigens can more freely penetrate through the intestine wall into deeper tissues. In such a way during chronic stress can appear or exacerbate such diseases as Crohn's syndrome, colitis ulcerosa or IBS (35).

"Emotional eaters" they are persons, who eat large quantities of food during stress and try to overcome the stress by overloading intestines nervous system (36). From the other side various pathologies of bowels are noticed in persons ill with depression, anxiety, aggression (37). The fluctuations of the dopamine in CNS influence the development of anorexia nervosa and obsessive-compulsive disorder. In this case the body weight rises or falls according to prevailing metabolism features (38). One more example of the relationship between brain and intestines nervous system – the viability and growth of the CNS nervous cells depends on how much you eat between regular meals. When intervals between meals are increased or some of them are omitted altogether, the quantity of brain neurotrophin factor (BNF) can rise up to 7-8 times in various parts of the CNS. This increase raises the survival rate of the neurons and diminishes the probability of various forms of brain stroke. Blood pressure falls, pulse becomes more rare and if stressful conditions arise in this case, the organism adapts itself more easier and finally survives. However, to increase the concentration of BNF artificially is not recommended because of various possible side effects of BNF (39).

The diversity of psychosomatic interconnections can be illustrated with several more examples. Some authors reported that hyperthyreoidismus was found in 20% of depressive patients and hypothyreoidismus

was noticed in 11 % of cases (40). At the same time other researchers (41) indicate that the treatment of depression is more effective if huge, over-physiologic doses of levotyrocsin (T4) are prescribed. In the case of depression pathognomical could be the studies of the levels of cortisol and leptin: concentration of leptin is lower while concentration of cortisol is higher than in healthy subjects (42). Major depression, anorexia nervosa, bulimia nervosa are connected with hypertyreoidism, gonadal dysfunction, increased risk of osteoporosis. Decrease of bone density can be the final stage of endocrine changes. So, the major depression and alimentary and metabolic disturbances are among main factors of osteoporosis risk (43). Other researches (44, 45) argue that osteoporosis is influenced by other numerous factors, such as anorexia, schizophrenia, Alzheimer's disorder, alcoholism, decreased physical activity. Along with changes of osteoblasts-osteoclasts activity, there are changes in production of hormones –cortisol, estrogen, testosterone, prolactin, parathyroidin, some of cytokinines, interferons, growth factors. However exact relations of psychiatric disorders with changes in bones are not clear yet: are they interconnected, or are they going parallely.

Inflammatory processes of the skin – including erysipelas and psoriasis – are known as a result of long-period stresses. For example, psoriasis is treated more effectively if along with traditional remedies the anti-stress treatment (drugs, psychological methods) is used. It is thought that there exists functional axis of CNS-skin, therefore for the treatment of the skin diseases the holistic point of view is proposed (46). The course of acne had exacerbated for students before exams. Acne vulgaris is most widely spread skin infections disease and almost 85 % of people has acne in various periods of life. Stress is thought has great influence for the appearance and the course, as in the example with the students, of this illness. This is related to the fact that stress stimulates secretion of hormones, which exacerbates the course of acne, because the number of sebaceous glands increases. Stress increases the excretion of various chemical substances, which activates inflammatory processes. It is known, that stress inhibits the convalescence of wounds up to 40 %. Chronic stress can develop into chronic skin diseases -psoriasis, alopecia areata and atypical dermatitis (47).

Various pains o different origin, among them headache, lumbar pain can be associated with depression. In other words, if you suffer

long- term, intensive pains of unknown origin, it's worth to consider a visit to a psychiatrist (48, 49).

Even such serious illnesses as multiple sclerosis can be cured more effectively, if the stresses are avoided (50). The same is right also for breast cancer, when it is stated, that stress and straightforward diagnosis can exacerbate the course of illness. Stress, the status of the mind and compensatory mechanisms are acting in concert, in order to influence immune system and concentration of the hormones. This in turn acts on the development of tumor (51). More than 40% of patients with breast cancer indicate, that their illness was provoked, a least partially, by stresses (52). This chapter would like to end with several thoughts of biological psychiatry. Long time the development of psychiatry was hampered by dichotomic view: mind-body, psychological-biochemical theories. The integration of these views into bio-psycho-socio-behavioral model of psychiatry will lead to better understanding of mind pathology and will help o treat it more effectively (53). Our health and our disorders depend on biological causes and ecological – social surroundings. Many of neuropsychiatric disorders forms can be common product of biological and sociocultural factors (54).

Table 1. **Medical Problems That Present with Psychiatric Symptoms**

Disease	Common Medical Symptoms	Psychiatric Symptoms and Complaints	Impaired Performance and Behavior
1	2	3	4
Acquired immune deficiency syndrome (AIDS)	Lymphadenopathy, fatigue, opportunistic infections, Kaposi's sarcoma	Depression, anxiety, disorientation	Dementia with global impairment
Hyperthyroidism (thyrotoxicosis)	Tremor, sweating, loss of weight and strength, heat intolerance	Depression, anxiety	Occasional hyperactive or grandiose behavior
Hypothyroidism (myxedema)	Puffy face, dry skin, cold intolerance	Lethargy anxiety with irritability, thought disorder, somatic delusions, hallucinations	Myxedema madness; delusional, paranoid, belligerent behavior

1	2	3	4
Hyperparathyroidism	Weakness, anorexia, fractures, calculi, peptic ulcers	Either state may cause anxiety, hyperactivity, and irritability or depression, apathy, and withdrawal	Either state may proceed to a toxic psychosis: confusion, disorientation and clouded sensorium
Hypoparathyroidism	Hyperreflexia, spasms, tetany	Either state may cause anxiety, hyperactivity, and irritability or depression, apathy, and withdrawal	Either state may proceed to a toxic psychosis: confusion, disorientation and clouded sensorium
Hyperadrenalism (Cushing's disease)	Weight gain, fat alteration, easy fatigability	Varied; depression, anxiety, thought disorder with somatic delusions	Rarely produces aberrant behavior
Adrenal cortical insufficiency (Addison's disease)	Weight loss, hypotension, skin pigmentation	Depression – negativism, apathy; thought disorder – suspiciousness	Toxic psychosis with confusion and agitation
Porphyria – acute intermittent type	Abdominal crises, paresthesias, weakness	Anxiety – sudden onset, severe; mood swings	Extremes of excitement or withdrawal; emotional or angry outbursts
Pernicious anemia (Addisonian anemia)	Weight loss, weakness, glossitis, extremity neuritis	Depression – feelings of guilt and worthlessness	Eventual brain damage with confusion and memory loss
Hepatolenticular degeneration (Wilson's disease)	Liver and extrapyramidal symptoms	Mood swings – sudden and changeable; anger – explosive	Eventual brain damage with memory and I.Q. loss; combativeness
Hypoglycemia (islet cell adenoma)	Tremor, sweating, hunger, fatigue, dizziness	Anxiety – fear and dread, depression with fatigue	Agitation, confusion; eventual brain damage
Intracranial tumors	None early; headache, vomiting, papilledema later	Varied: depression, anxiety, personality changes	Loss of memory, judgment, self-criticism; clouding of consciousness
Pancreatic carcinoma	Weight loss, abdominal pain, weakness, jaundice	Depression, sense of imminent doom but without severe guilt	Loss of drive and motivation

1	2	3	4
Pheochromocytoma	Headache, sweating during elevated blood pressure	Anxiety, panic, fair, apprehension, trembling	Inability to function during attack
Multiple sclerosis	Motor and sensory losses, scanning speech, nystagmus	Varied: personality changes, mood swings, depression; bland euphoria uncommon	Inappropriate behavior caused by personality changes
Systemic lupus erythematosus	Multiple symptoms of cardiovascular, genitourinary, gastrointestinal, other systems	Varied: thought disorder, depression, confusion	Toxic psychosis unrelated to steroid treatment

PSYCHONEUROENDOCRINOLOGY

Psychosomatics, psychoendocrinology, stress, crisis and other similar subjects can not be totally separated. At the end of the last chapter we have described some disorders, which symptoms were determined by damages in somatic as well in endocrine and central nervous systems.

Now I'll try to analyze and describe one of the most urgent stressful situations in USA after the attack of 9.11 – how people are living, what are they feeling. After that I somewhat repeatedly will try to indicate the stress-trauma-crisis interconnection and later – very schematically – psychoendocrine-anatomo-physiological connections, functional interdependence of stress and hypothalamic-pituitary system. Finally I will review psychic disorders, which are determined by the pathology of endocrine system and vice versa.

Before 09.11.2001 the inhabitants of USA were living in hothouse conditions and nationalism, patriotism, Americanism have nothing in common with world catastrophes – nothing and nobody can hurt, attack or each us. Maybe something bad can occur somewhere in Africa, Asia, recently in Europe but not here, in the USA. The mind, nervous and somatic status of the USA citizens got the more severe blow, than if this act of terror would occur in any other place of the world. Te most powerful, most safe country, which did not saw any aggression from outside for centuries, suddenly received the furious blow into the most vital and

important points N.Y – twin towers, located in the heart of Manhattan and Pentagon. In the years that followed this catastrophe the health status of many USA inhabitants not even have improved, but on the contrary, it have worsened, especially in the face of war in Iraq. ”Not since right after 9/11 has this country been as anxious, fearful, or felt as helpless as we do today. The increase in the anxiety level of the people we were able to re-interview was not just higher, it was significantly higher. About 385 people are expected to die on Americans roads and highways over one weekend. Yet, we'll all get in our cars and go about our lives” (55).

It was found that there are 4 groups of people, who suffers mostly after the September events: a0 inhabitants of N.Y. between 30-60 years of age, b) middle class citizens, c) inhabitants of N.Y, who 6-12 months before the strike were jobless and d)those, who had at least 2 stressful events before the September strikes (deaths among family members, divorce or others) (56). 25% of inhabitants have started to drink alcohol, 11% - to smoke more and 4% mere people started to smoke marihuana. This can indicate that these people are less resistible for PTSD, depression and panic attacks (57). Women reacts to this kind of events more drastically, therefore they more frequently develop PTSD, they drink less, smoke, take drugs less (2,4-3,8 times less than men) frequently. 18 months after terror attacks their quality of life remains lower than that of the men. It's thought that women are more sensitive to the traumatic events and the symptoms of their PTSD prevail longer (58). With the years the stress for the people worsens and accumulates. This tendency is noticed both by employees and employers. The cost of treatment of depression and stress-related disorders has risen significantly comparing with years before 2001 (59). The citizens of USA feels deeper anxiety related with terrorism, especially after the beginning of the war in Iraq. Scientists explain this using the form “hormone triggers“, which have great impact on the health. When a man feels the shadow of anxiety, the organism replies with greater efforts. This can be noticed at some moments in life and for short time, but the strain, which is present for longer periods can damage health. A person, who gets involved into stressful situation s loosing his good habits or gains bad ones: alcohol abuse, smoking, drugs. After some time the symptoms of stress manifest themselves: disturbed sleep, muscle pains, the symptoms of older disorders reappear (60).

Let's now review shortly nervous and humoral mechanisms of the stress. "Stress is a part of life"- has written Selje. The secret of life is – how to bear the changes induced by stress. Stress can be reviewed in three ways: crisis – trauma – PTSD. Stress starts in the brain. Then the complex networks producing neurochemical substances such as serotonin, dopamine, norepinephrine comes into action. Pulse and blood pressure are changing, pupils dilate, the feeling of anxiety –agitation appears. Psychical stresses are specific. It is thought, that subconscious conflicts are related with psychosomatic disorders. The positive relation between the stress and infectious diseases is also noticeable – stress makes immune system stronger.

If stress is temporal, momentary, a process with backward motion, than this is a crisis, disturbance of physiological homeostasis, when compensatory mechanisms, usually effective, are already insufficient and so the functional disturbances manifest themselves. The cause of crisis can be very powerful event in someone life, sometimes even turns the whole life into other direction. Crisis could be held finished, when cognitive functions are restored and problems, which gave rise to the crisis, are also solved.

Trauma is a human reaction to a strong stress, ac of crime, outbreak of infectious disease and other similar situations. This status is characterized by anxiety, agitation, anger, extreme irritability. Sometimes reaction to trauma can be inadequate: stupor, depression, frustration. PTSD – posttraumatic stress disorder – can be acute, chronic or prolonged psychiatric disorder. It is characterized by altered reactions to surroundings, disconnection from the surrounding world, changes in personality, paranoidal ideas, frequent episodes of depression, possible dependence on alcohol or drugs. It is accompanied by fear, episodes of frustration, sleep disturbances. PTSD appears after very strong traumatic experiences, related to the deaths of family members or friends, after events of severe cruelty, suicide attempts or self-mutilations. These events frequently are experienced by the persons of special professions: soldiers, policemen, firemen, physicians. It is pity, but the greater number of people every year encounters stressful, critical circumstances, which lead to PTSD.

Stress, crisis, trauma and PTSD are determined by wide variety of physiological and psychological mechanisms. Along with personality, adaptational plasticity, social security factors, there exist such factors as

sex, culture, earlier life experience – all this influence the final outcome of stress (62).

Central nervous system reacts to stress by secreting specific chemical substances, which activate peripheral endocrine structures, which in turn secrete their own agents. The main structures of CNS are thalamus, hypothalamus, limbic region, amygdala, pituitary glad. Al the information from the internal organs, the cortex, the outer world and limbic structures goes to hypothalamus. Hypothalamus secrets hormone releasing hormones –HRH- the hormones, which activate the releasing of other hormones. HRH with the blood circulates in the body and stimulates or inactivates other endocrine glands to secrete their own hormones, for example cortisol in the suprarenal glands. All links have feedback and a possibility to stimulate or suppress every other chain, even the thalamus. Only amygdala during stress is always excited reminding to other structures – remember this moment and be ready! Hypothalamus is sending to pituitary gland cortisol, tyrotropine, gonadotropine hormones. From the pituitary hormones with the blood stream reach peripheral endocrine glands – adrenal, gonadal, thyroid, pancreas. In turn their hormones through the blood can influence thalamus – the feedback connection closes. The role of human hypothalamus – pituitary – adrenal (HPA) axis, its activity regulating hypocampus structure role are demonstrated by the magnetic resonance studies (63). In the case of stress one of neurotransmitters –serotonin makes the sensory information more easily accepted, helps to maintain the balance between corticotropine hormone hypersecretion and neurochemical, autonomic, behavioral and immune reactions (64). The plasticity of the CNS of adult people is regulated by hormones. Hypocampus takes part in contextual and spatial learning, in formation of memories and also controls autonomic as well as vegetative functions – secretion of ACTH. Hypocampus frequently suffers from the head traumas and repeated stresses. It has adrenoreceptors of two types: mineral- and gluco-corticoids, which are very important in the processes of nervous impulses transmission, inhibition, neurochemical and adaptational mechanisms. In addition to this, the hypocampus is sensitive to gonadal hormones. Persons, who survived holocaust have the atrophy of CNS due to hypersecretion of glucocorticoids. The most affected structure is hypocamus. Increased HHA activity for 4-5 years (chronic stress) worsens the cognitive functions, for example, the spatial memory. This can be due to the fact that

hypocampus is the main target of epinephrine in the central nervous system, meanwhile the adrenaline influences the plasticity of hypocampus and so diminishes the number of nervous cells.

Hypothesis of the role of glucocortisol cascade in the mechanisms of stress and aging: progressive inability of hypocampus to shunt the HHA creates the conditions for increase of glucocorticoids secretion and the further process of hypocampus degeneration. With age the hypocampus becomes even more damageable because large quantity of secreted and irritating amino acids left after stress. Hypocampus can be damaged by ischemia, head traumas. The expression, deepness of reaction to stress is determined by formation of HH axis and autonomic nervous system during young age (65).

Serotonin – 5-HT – is pivotaly related with HHA and responses of the organism to stress. Serotoinergic neurons innervate CNS zones, which regulate HHA, especially the region of hypothalamus, hypocampus and amygdala. Increased quantity of of serotonin raises concentration of CRH, ACTH and cortisterone. The importance of serotonin in the study of the number of disorders related to stress increase, because the axis of responses to stress is modulated by 5-HT serotonin receptors. In spite of the fact that various stresses activate the serotoninergic system, the final effect depends on the type of stressor and mostly affected anatomical zone. Serotonin system includes 14 types of receptors and the relation of stress - 5-HT system can be reviewed into two variations depending on: 1) the ability of 5-HT receptors to modulate the activity of HHA and 2)the ability of stress to influence the 5-HT receptors (66). For example, the freezing can affect asimetrically right frontal brain region, which in humans is related with negative associations. The freezing itself induces the increase of the quantity of cortisone and CRH in the CSF (cerebrospinal fluid) (67). During stress, when glucocorticoids are influencing hypothalamus, the concentrations of norepinephrine and serotonin increase while that of the dexamethazone – decrease (68). Corticosterone has the circadian rhythms also during stress. The concentration of the corticosterone almost does not reacts to stress, when its concentration in blood plasma is already high. In principle, the organsof HHA react depending on the type of stress as well as on the time of its action (69).

We technically reviewed interrelations between stress, structures, hormones, neurons. Now we will review in short the disorders, which can be determined by stress when it disbalances the HHA.

When 230 patients of endocrinological department were studied, the most frequent accompanying psychic disorders were affective (34%) and neurotic (33%).

The disorders of schizophrenia spectrum disorders, such as schizophrenia, schizoaffective and schizotypical disorders were most frequent in the cases of hyperthyreosis (15%). The depression was determined in 25% of patients with thyreotoxicosis. 48,3% of patients with hypothyreosis was depressed. In the case of diabetes 31% of the patients had an addiction affective disorders, while affective disorders in patients with prolactinoma of pituitary gland was found in 28% of cases. This shows the possible comorbidity of endocrinologic and psychiatric disorders. The psychiatric diathesis also can be considered (70). Many stresses, including the emotional ones, increase the quantity of norepinephrine in various regions of CNS, especially in hypothalamus, amygdala and corpus callosum. Marked increase of norepinephrine occurs during double stress: psychological stress and sensation of strain, which induced in experimental animals the reactions of anxiety and fear. The assumption, that strain and stress can induce the reactions of anxiety and fear is made (71). Prenatal stress also can be cause of the neurobiological and behavioral changes, so called prenatal stress syndrome. This kind of stress causes changes, which remain a long time after the childbirth. Hyperglucocorticoidose can induce prenatal stress syndrome and not only to have influence to the behavioral changes, but also can disturb the development of cardiovascular system and cause metabolic perturbations. Long-term action of corticosterone hyperactivates HHA and this results into frightful behavior, feeling of uncertainty (72).

I have mentioned the changes in psychology of USA citizens after terror attacks 2001.09.11.There are several characteristic features more. Constant negative images and news: nuclear weapons in N.Korea, snipers in Maryland, undeclared war, domestic violence – all this makes society very damageable and unpredictable, unprognoseable, uncertain, anxious. Where to go, that the children could feel safe. This question, of course, is vital to the parents in Iraq, Palestine and other troubled countries. This is life in extremely helpless and irritated surroundings. The sense of fear goes biological. People are smoking, drinking and eating

too much. There are more road accidents, myocardial infarctions and strokes. 19 million Americans suffer from fear-induced disorders. CNS is not only the thinking machine- it also is an instrument of biological adaptation, which must help to survive in all conditions. CNS is very sensitive to the signals of danger from the surrounding world. The center of the fear – the amygdala – is closely related via nervous connections with other neural centers. When amygdala is excited it does not wait for command. It acts independently. Under its influence hypothalamus is producing CRRH, the latter with the help of pituitary activates adrenal glands, which starts to secrete the epinephrine, norepinephrine, cortisole. These stress hormones inhibit the immune and alimentary functions of not primary importance and all recourses are directed to the fight with the stress. The heart and lungs are activated, muscles get more food –glucose. CNS also is activated, the structures, which remember stressful situations, are turned on. Correlation between the severity of stress and longevity of memory is established.

One of the stress hormones – norepinephrine – is toxic to the tissues, especially to the myocard. From the bombs and terror acts have died hundreds, at the same time victims of stress and norepinephrine can be counted by thousands. Prolonged stress has its serious physiological outcomes:fear, stress – all this is epinephrine baths in which the heart and blood vessels are washed. Prolonged increase of cortisole concentration inhibits immune system, the risk of infections and oncological diseases increase. CNS is also damaged – the connections between different centers are broken. Hypocampus, the source of information about past events and emotions becomes smaller. People are complaining about headaches, insomnia, back pain, neck pain dezorientation, but physical examination does not show any somatic disorder. Stress manifest itself through body ailments. Especially sensitive to stress are children. They fear to go to school, fear to sleep, fear to be separated when catastrophe will strike. They feel pain in the stomach, various disorders are present, but mostly affected are the brain of the young people. Childhood fears can grow into generalized anxiety, including various phobias and PTSD, when amygdala gets involved and involves other CNS systems. As a result the organism reacts to new stimulus as to stress. Around 11 millions Americans feel themselves affected by some kind of phobias. Some fears are specific, some –generalized, but never

forgotten! Prefrontal cortex contains the centers which keep in memory information about past stressful events, crisis and catastrophes (73).

Depression affects 10-30% of the world's population. In spite the fact that depression more frequently affects women this disorder is not avoided by men, old people and adolescent. One of the most important neurotransmitters – serotonin – regulates emotional and physiological functions of the organism, which are disturbed by depression (74). In the case of depression the HHA axis comes out of order: its basic ratio of dexamethazone and CRH is greater than normal (75). After HHA axis is disregulated and then restored by antidepressant treatment the risk of recurrent depression is growing (76). The strong correlation between the severity of depression and the high concentrations of cortisol was noticed; the increase in cortisol and serotonin concentration with decrease of androsterons is deepening the depression related to alcohol withdrawal (77). The deepeness of depression can be judged on that: the higher concentration of cortisol, triglicerids and insuline along with lesser concentration of testosterone – the more severe depression (78). The depression during postmenopausal period can be treated with additional injections of estrogenes. As it is seen in the recent works f some researches the deepness of depression is closely related to lessening concentration of gonadal hormones and increasing concentration of cortisol (79). The similar results are noticed when: during uncontrolled stress the concentration of cortisol is growing and with the normalization of situation these concentrations returns to the initial values. At the same time the concentration of testosterone falls during uncontrolled stress and returns to the normal values after the situation goes under control. That means that during depression undergoes the same changes as during the situation of uncontrolled stress (80). The changes of the concentration of testosterone in the blood does not entirely reflects female menopause, however the "syndrome of low testosterone" can produce such disorders as anxiety, affective disorders, impairment of cognitive functions and these are the features of hipotestosteroidism (81). Under the influence of stresses, such as induced by magnetic fields of industrial frequency, marked changes of HHA axis can be noticed: the system of pituitary-gonadal glands is suppressed, the metabolic processes and androgenic function of testiculi are disturbed (82).

One of the psychiatric problems – insomnia – is neuroendocrine process. It was found that uncontrolled return from stress status in-

creases the concentration of cortisol and insomnia becomes deeper (83). Chronic fatigue syndrome also disbalances HHA axis, however in this case HHA axis appears as to be blocked, suppressed. Low concentrations of cortisol and increased concentration of 11-dezoxicortisol permits to suspect secondary adrenal insufficiency (84).

Glandula pinealis – the epiphysis – is one of the most mysterious glands. It was called the third eye and sahasrara cakra. If Aristotle placed the soul in the heart and Galen – in the brain, then Descartes choose gl pinealis. This gland is in the center of the brain and its function is triple: 1) reproductive, 2) skin pigmentation and 3) brain function. The gland produces melatonine – the skin pigment – during the night, while circadian, circanual and other cycles as well as reproductive periods are related to gl. Pinealis. Melatonin agent is substance normally associated with pineal mediation, i.e. intermediation in reproductive involution. Gl. pinealis can equally successfully stimulate and inhibit neuroendocrine-reproductive axis. Epihysis produces two types of hormones: indoles and peptides. It also secretes, mainly at nighttime, melatonine. If the production of this hormone is disturbed then the feeling of night and day becomes mixed and this can lead to the psychic processes, which in turn can result in depression (85).

Now a piece of science fiction. We can record electrical potentials from amygdala (remember stress announcer) during learning process and in the same monitor we can see emotions. We cant to say what a person feels or thinks, but we are able to determine that there exist emotional problems. Many of CNS researchers studied thinking, but not emotional problems. Amygdala is controlling the expressions of anxiety and fear. For example, if asked, there is no one who do not like black people. However the recording of biopotentials from amygdala let us see when amygdala is reacting, i.e. person is lying. In that way the politicians and sportsmen liars can be detected. But if seriously - the amygdalas of schizophrenics are lesser and emotional barometer, which measures the emotional charge of surroundings, is out of order. These patients can feel the anxiety and fear coming from totally simple objects and innocent people and their reaction can be absolutely inadequate: the aggression and paranoic reactions are possible. When people with PTSD were studied, it was found that the functional level of their amygdalas was considerably higher than statistical mean. At one hand this raises concern, on the other – allows to foresee the strategy of correction (86).

PSYCHONEUROIMMUNOLOGY

Stress is also affecting the immune system. Immune system is sending signals to the brain – change the activity of CNS – and all is changing, what depends on the activity of nervous system: behavior, thoughts, mood. On the other hand the daily changes of mood, cognitive functions, emotional experiences change with the time and without notice the immune system itself.

"Nonspecific" response of immune system – the fight against infection or physical damage starts 1-2 hours after the event. This nonspecific response induces and starts a set of psychological and behavioral mechanisms: rise of temperature, changes of liver metabolism, diminishing consuming of food and water, decreased sexual activity, increased anxiety. The classical stress responses are activated – the stress hormone cortisol is released. All this can be named using one word – illness. Illness is arranged in that way, that organism as an orchestra optimally will gather all its strength for the fight with infection. Since impulses instructing how to fight come from hypocampus it is interesting to find out from what source the latter gets information about infection. Immune cells – macrophages - are producing molecules-antiinflammatory cytokinins – interleukins 1,6 and necrophytic alfa factor of cancer. These molecules are functioning in the brain and they start the mechanisms of stress. Cytokinins do not directly start the mechanisms of stress but they stimulate nervous vagus and it in turn irritates the hypocampus. How this goes? Near the n.vagus there are the pockets of paraganglions or transmitters, which containinterleukin-1 receptors. So the link is formed: macrophages attack bacteria and release interleukin-1, this binds to receptors of n. vagus paraganglions, neurotransmitters activate n.vagus and finally the latter sends impulses to the CNS. These impulses prompt CNS to produce its own iterleukin-1 and this induces the signs of "illness" and immune cells are activated as well. Infection as well as stress activates neural links, which stir into move as mediator the interleukin-1. So the stress can produce physiological changes such as rise of temperature, increase of white blood cells in the blood, activation of macrophages. In principle, the stress can induce the similar reaction as infection. In other words, infection stirs the nervous links and they become more sensitive to stress and vice versa. Stress enhances the first grade, non-specific immunity. Stress is like some kind of infection.

Nervous and chemical chains activated by stress are the same as stimulated by infections. On the other hand, depression – depressed mood – is the same behavior changes as if the disorder and the stress affected a person at the same time: the changes, which save the energy and guard against injuries. If we inject interleukin-1 for the patients with malignant diseases, the depression can develop. And on the contrary, in the blood of depressed patients large quantities of interleukin-1 is found. The products of immune system are changing the activity of neurons and all what comes out of this activity is: learning, memory, behavior. It is a commodity that hormones are changing the activity of CNS. It must be remembered that immune processes are also affecting CNS functions (87).

Psychological stress can induce many health-threatening outcomes: increases the possibility of respiratory inflammations, stimulates the progress of coronary pathology, deepen autoimmune processes. Stress is accompanied by inhibition of lymphocyte proliferation, weakened humoral response to immunization, worsened wound healing. What is the interrelation between stress, immune system and illness? As a result of stress a number of complications can arise in several ways: a) some of nerves, descendent part of which must activate lymphoidic tissue, are blocked; b) the secretion of neuropeptides and hormones, which bind leucocytes and change their function, is activated; c) immunomodulatory actions are induced, which, seemingly, fights stress: smoking, drinking, drug abuse. As a result the ability of immune system to struggle with infection is considerably decreased. Under the influence of stress the pathologies of several types can appear: infection diseases, some forms of cancer, the healing of wounds is disturbed. As a result of stress such diseases, where inflammatory processes play the main role, can became chronic: allergic, autoimmune, rheumatoid, cardiovascular disorders. On the other hand the suppressed inflammatory process makes the course of disorder more favorable. Chronic stresses decrease the sensitivity of immune system to glucocorticoid hormones, which normally finish the inflammatory process. Chronic stress also increases the secretion of hormones in the HHA and sympathetico-adrenal medullar (SAM) axis. The excess of these hormones disregulates the functions of white blood cells as well as receptors, which bind glucocorticoids and this in turn, decrease the ability of immune system to react to antiim-

flammatory function of cortisole. As a result the imflammatory process "blossom" and the course of illness exacerbates.

The cortisol plays the leading role in regulation of inflammatory reaction to inflammatory process, damages. When the HHA axis gets disbalanced, the mass of glucocorticoids is floating in the blood, the glucocorticoid receptors become "wary", disregulates and the sensitivity of immune system to cortisol falls down.

Chronic psychological stress changes the production possibilities of antiimflammatory citokinin interleukin-1,6 and tumor necrosis factor (TNF). The studies of parents who have children with cancer, as a group of people experiencing severe psychological stress, have shown, that 20 % of them had PTSD and in addition the decreased immune system sensitivity to glucocorticoids. In depression the sensitivity to glucocorticoids is decreased also in the nervous system. Chronic stress changes behavioral features as well. This especially manifests itself by sleep disturbances, changes in feeding and physical activities. Speaking about the group of parents who nurse critically ill children the importance of social support, which at least partially compensate biological consequences of the stress, must be mentioned.

The consequences of chronic stress can be grouped also in that way: a) the ability of glucocorticoids to inhibit the production of proimflammatory citokinins is decreased; b) the condition of patient is exacerbated by negative affective states, bad adaptational features and disturbances in cortisol secretion; c) social support as one of the possible factors, which can help to cover the sensitivity of receptors to glucocorticoids (88).

We encounter stress every day and our brains perfectly control and compensate the consequences of stress by physiological and behavioral responses. CNS with the immune system are the major and primary target of the stress. Stress hormones for a short period of time play guarding role, but extended stresses can transform into damaging factors. Immune system replies to acute stress with increased secretion of adrenalin, steroids and catecholamines along with local production of citokinines. Immune system is regulated by nervous system, which receive impulses from its sensoric, sympathetic and parasympathetic parts as well as from circulating hormones, especially glucocorticoids. During acute stress the reserves of energy are mobilized, vegetative and reproductive processes are suppressed, organism is prepared for "escape or

fight". Immune system is ready to meet infection in the case of damage. The number of lymphocytes, monocytes in blood decreases, but augment in skin and tissues. When cells go into tissues, the tissue factors activating immune system are involved. The important factor is gamma-interferon, especially in the case of prolonged stress (66).

Citokinins, interleukins and TNF can stimulate the adrenal glands to produce various neuropeptides – secretogonine II, golamin, vasoactive intestinal polypeptide, which are known also as inhibitors of immune system. These monopeptides can be targets during inflammation. This shows that neuroendocrine products, including and katecholamines, which are secreted in adrenal glands, can help to regulate immune system. Neuropeptides are produced also in other neuroendocrine cells and tissues: in pancreas, alimentary tract, where inflammatory reactions are fairly frequent and where neuropeptide secretion can successfully regulate inflammatory reactions. Neural hormones oxytocin and vasopresin also are taking part in the production of T-cells and thymus (89).

Immune system acts as diffuse sensory system, which detects specific chemical elements related to dangerous microorganisms and reports about this to the brain. Immunosensitivity is chemosensory system (90). Jolly, energetic and relaxed people get cold, have depression and other nervous and psychiatric disorders less frequently than angry, upset people. Positive emotional status maybe is not the main factor influencing the frequency of infection with pathogenetic microorganisms, but the inflammatory process and the symptoms of illness among joyful people are softer, i.e. psychological stronger people possess stronger immune system (91). It is known that immune and endocrine systems collaborate when react to immuno/inflammatory processes. Now it is clear too, that fatty tissue also takes part in immune processes. Leptine – is a hormone, which resembles citokin – takes part in stress responses: it can enhance the survival rate during septic chock and its quantity increase in the blood of critically ill people. Similarly as citokins leptin is sending the signal of danger to the CNS and receptors of leptine are situated near the receptors of citokins. Leptin stimulates the secretion of glucocorticoids, endotoxines and citokins and inhibits HHA axis activity. The primary target of leptin is adrenal glands. Leptin and glucocorticoid interact via feedback: glucocorticoids stimulate the production of leptin and the latter inhibits the activity of adrenal glands. All this indi-

cates that there is a close relation between endocrine, immune systems and fatty tissue (92).

The studies of people who have experienced stressfull situations have revealed that soldiers, veterans, who were diagnosed PTSD, more frequently had autoimmune and psychiatric disorders- arthritis, multiple sclerosis, schizophrenia, depression, hysteria, paranoia. 1972 veterans of the Vietnam War were studied. Autoimmune disorders had 17-19% of soldiers. Veterans with PTSD and psychiatric disorders had autoimmune disorders 3 times more frequently. PTSD manifests itself with nightmares, anxiety and agitation (93). When students who were finishing their diploma works were studied, there was noticed the weakening of the immune system. That was very conspicuous when students got involved into stressful situations – deaths and accidents in the family or among relatives and friends. Under the influence of stress the development of insomnia, incorrect diet is very common outcome. Stress evokes physiological response of the body. The less we care about body, the bigger possibility to become ill under the influence of stress. Therefore it is highly recommended for the students to feed correctly. To avoid stressful situations during study period, to regulate the daily schedule (94). The imaginary virtual stress is associated with low quantity of antibodies in the blood. Low psychological profile, anxiety and strain are also related to low quantities of antibodies. Psychological discomfort, lowered mood as compared with real stress, do not increase the concentration of adrenalin in the blood (95). If mice in their earl days had the infectious diseases then, when they became adult, this experience could manifest itself with autoimmune disorders. The intestinal infection can evoke stress reactions in CNS: concentration of coticosterone increases as well as number of serotonin containing neurons. These changes can determine the neuroendocrine autoimmune disorders in later period of life. The illnesses, traumas during young age can disbalance the HHA axis, which can more sensitively to respond to stressful situations and can be cause of various disorders in the future – stress related autoimmune, psychiatric, cardiovascular and similar disorders (96). The cardiovascular reactions to stress can be divided according to immunological changes. Persons, who react to stress by heart, are more inclined to have autoimmune disorders. Stress affects the functions of cardiovascular system into two ways: heart rate becomes more rapid, blood vessels constrict, blood pressure rises. For the part of the people blood pressure

rises as a result of increase in heart rate, while for the others – due to increase of blood vessels tonus. The reaction of the heart to stress is always very marked. The reaction of immune system to stress can be observed in the distribution of the lymphocytes in the organism. It was noticed that lymphocytes distribute only in these patients, who react to stress by heart (97).

Psychoneuroimmunology (PNI) describes mental relations and links between nervous system (mind) and immune system. Lymphocytes have large number of neurotransmitters and neuromodulators receptors, while from the other side CNS contains neuroreceptors, which are characteristic for immune cells as well as neurons producing immunomediators – citokins. Serotonine transmission is one of the CNS regulatory systems, which is in charge of various reactions to stress. This system also coordinates relations between CNS and immune system. Of course, serotonergic system plays very important role in the regulation and control of links between psychiatric disorders and immune system (98, 99). Psychiatric disorders related to immune system are being studied by number of researchers and the interest in these problems is growing day by day. The major depression is associated with T-immunosuppression and the main link – the superiority of nervous system (100). Dysfunction of HHA axis is considerably expressed in depression and is best diagnosed by the neuroendocrine changes: decreased concentration of dexamethasone and increased quantity f CRH (corticotropin releasing hormone). HHA system is closely related with immune system. The changes of immune system during depression are also described: concentrations of cortisol and interleukin-6 in the blood changes depending on psychic status (101). Proinflammatory cytokins, interleukin-1 can suppress the function of glucocorticoid receptors and takes part in pathophysiology of depression (102). Stress may lessen the number of lymphocytes and is related to immune responses – concentration of T-antibodies, activity of phagocytosis. Depressed states of mind are also related with increased mortality, higher incidence of infectious diseases. In addition, depression and anxiety frequently are connected with oncological disorders and infections, where in the beginning of the former the latter can be as a prognostic sign of illness (103). The increase in the activity of HHA axis and altered nonspecific responses are observed in depression. Immune and endocrine systems are related: glucocorticoids change the secretion of cytokins in peripheral mononu-

clears in vitro, while inflammatory cytokins in vivo activate HHA system (104). Immunological changes are observed in schizophrenia. Autoantibodies, activation of lymphocytes, aberrations of citokins, retroviruses and HLA-associations – these are the most common changes in schizophrenia (99). In schizophrenia T-lymphocytes decrease by 30-40%, T-helpers and T-suppressors –21-29 and 7-9 % accordingly, while the number of B-lymphocytes increase by 17-24% (105). Cytokins, interleukins –1,2 are transmitters of HHA axis metabolism. Their concentration in spinal fluid increase in case of schizophrenia Especially the increase of the concentration of these substances is observed after physical, psychic stresses, somatic illnesses or traumas. Schizophrenia can be viewed as disbalance between peripheral and central nervous system from one side and immune system from another: antipsychotic therapy regulates this disbalance (106). In the course of schizophrenia the number of antibody increases, the quantity of gama-interferon decreases what is the indication that cell immune activity is diminishing. Decreased concentration of interleukin-6 could be a pathognomic marker of this disease. Thus, shift from cell to humoral immune activity is characteristic for schizophrenia (107). Not only schizophrenia and depression can be the outcomes of disturbed immune system. There is a supposition that CNS disorders, related to memory impairment, and seizures may be caused by antibodies, which are directed against CNS cells. Thus, some forms of epilepsy can be of autoimmune disorders (108). Neuroimmune mechanisms can be responsible for the autodestruction of neurons in Alzheimer's disease. Increased concentration of T-lymphocytes in the spinal fluid and marked decrease of B-lymphocytes in the blood are also found. Interleukins-1, 6 are signaling about acute phase of the Alzheimer's disease. This phase can be caused by increased number of T-lymphocytes, which are traveling through the CNS and can evoke neurolyzis (109).

GENETICS

We have discussed endocrine, biochemical, neurologic and somatic connections in the organism, their mutual dependence and inseparability. All troubles, misfortunes, but on the contrary and convalescences, adaptations to the surroundings are also determined by the same interaction of psycho-neuro-immuno-neuroendocrine systems. However there

exists one more, maybe basic, link. This link is genetics, inheritance. There is a medicine branch, which studies and treats inherited disorders. I would like to clear up some other aspects. I would like to include genetic aspects along with neuro-immuno-humoral interrelations. Three problems, at least superficially, must be reviewed: a) genetic and psychiatric disorders; b) genetics and suicides; c) genetics and aggression.

Genetics and psychiatric disorders

The development of the sex and epidemiological findings studying psychosis are the phenomena, which is hardest to explain. It is supposed that it depends on genetically determined asymmetry of hemispheres of CNS, while the code of X and Y chromosomes is in homologous form. The mutation of this homologous genetic information or chromosomal alteration between X and Y determine hemispheric asymmetry and development of language. Genetic change also determines the sex differences: a) different dexterity of hands; b) interhemispheric asymmetry; c) development of language. As a result of genetic disorders, when hemispheres do not specializes and the control of the speech is not attributed to one hemisphere, such persons more frequently develop nuclear psychoses (110). At the present it is studied, what influence on the development of schizophrenia and bipolar mood disorders environmental factors, microorganisms and viruses have. Genomic research techniques, such as serial analysis of expression of genes, are used for these purposes. With the help of this technique it was established, that CNS of schizophrenics and those, who have bipolar disorders, differs from the CNS of healthy people. In the ribonucleic acids of psychiatric patients there are widely spread neurotransmitter's transport proteins, immune transport proteins and endogenous viruses. The latter are very important because they can demonstrate the mutual relation between infectious viruses and human genetic elements. RNA of schizophrenics and patients with bipolar disorder is not homologous with known human genus. Some RNAs are homologous to genes of other vertebrates or they can't be compared with known samples. These RNA can represent still not fond infectious agents of human genes or combination of genes and RNA of microorganisms. All this allow to suppose that environmental factors as well as genetic changes can have influence on development of disorders of the mind (111). Relation between gene alterations and dis-

eases is shown by the fact, that prenatal viral infections (flu, for example) can determine development of schizophrenia in the future. Some mothers can be genetically predisposed to react to viruses by producing antibodies which battles not only viruses, but also the nervous cells of the fetus. The study shows that frequency of HLA DRB 1*04 genes is decreased in such ill mothers. This gene is directly related with rheumatoid arthritis, which is negatively related with schizophrenia. This can be related with autoimmune disorders. When 121 schizophrenic females were studied in many cases the diabetes was found. This indicates the inclination to autoimmune disorders. On the other hand, the child of diabetic mother can be exposed to the developmental defects of CNS, for example, schizophrenia, bipolar disorders (112).

Genetics and suicide

Suicide as disorder of behavior, of mind can be determined by multiple factors and like schizophrenia its etiology is very complex. Thus, the suicide may be, and in fact is determined by stress factors, which causes hormonal, norepinephrenic disturbances in HHA axis. The influence of serotoninergic system to para- and suicidal behavior can't be discarded (113). Number of studies confirmed, that alcohol or drug abuse are one of the causes stimulating suicide. Families of alcoholics, drug addicts, in which the drinking and drug abuse took place during intrautheric period or during early childhood years, can form predisposition in which a child discontent with its life can try to perform or commit suicide under certain circumstances (114, 115, 116). Along with alcohol and drugs as primary predisposing factors such psychiatric disorders are acknowledged: depression, schizophrenia (117, 118), Alzheimer's disease and parkinsonism (119), eating disorders –anorexia nervosa, bulimia nervosa (120). Somatic disorders, which tend to disbalance HHA axis can also have much influence (121). Low cholesterol concentration in the blood can evoke the exacerbation of depression symptoms and by that – the risk of suicide (122).

A number of European scientists have proposed an original genetic hypothesis of suicides: countries, in which the rate of suicides per 100 000 inhabitants are the highest, forms a belt – Finland, Estonia, Latvia, Lithuania, Russia, Belorussia, Ukraine, Hungary, Austria and Slovenia. According to L.L.Cavalli-Sforzathis is the second, principal component

of Europe's genetic map and people, living in this belt area adapts to the cold climate of the Northern Europe, while genetic peculiarities, psychiatric disorders and alcoholism makes preposition for suicidal behavior (123). This is global view of suicide problem in Europe. More detailed genetic problems concerning the aggressive behavior as well as psychiatric disorders are now in the scope of scientists and researchers. The genetic polymorphism in the genes ABCG 1, TPH, 5-HT1B, 5-HT2A, SERT, MAOB was researched in several hundreds of psychiatric patients (124). Tryptophan hydrolase (TPH), MAOA, serotonin transporter (5-HTT), serotonin receptors 1A and 1B(5-HT1A, 5-HT1B) were studied in 400 psychiatric patients who had bipolar disorder, schizophrenia, alcoholism or were after suicide attempt. Partially, the results of the study confirmed that there is correlation between SS 5-HTT and suicide rate, however there was no correlation between MAO and suicides (125). Decreased concentration of 5-hydroxiindolacetic acid could indicate higher probability of suicides and aggression, while the increase of the concentration of this acid frequently coincide with exacerbation of depressive episodes (126). Decreased binding potential of 5-HT2A receptors in prefrontal cortex zones also can indicate risk of suicide. This decrease in receptors binding capacities also was in concordance with the states of hopelessness and despair. This additionally confirms the influence of serotonergic zones functions disorder to suicidal behavior (127).

The influence of other enzymes and hormones to suicidal behavior is also being studied. For example, the influence of hydrolase on biosynthesis of serotonin is clear and genetic variations of this enzyme have an effect on psychiatric disorders, aggressive and suicidal behavior. Thus, the TPM gene jointly with neighbouring genes can have influence on suicides and can be more expressed among older women (128). The same opinion is backed by other authors who state, that tryptophan hydrolase (TPH) is responsible for psychiatric disorders and altered behavior. TPH is necessary for biosynthesis of serotonin. It was found, that polymorphism of TPA gene and two nucleotides (SNPs) is related to aggressive behavior and suicides (129). By the way, there are authors who attribute aggressive behavior (crimes, rapes) to changes in concentrations of triglicerids and cholesterol in the blood. Changes of concentrations of low and high-density lipoproteins in the blood along with fluctuations of testosterone quantity as well as genetic defects some-

times can determine aggressive behavior and inclination for suicides. From the other side, the studies of concentrations of lipoproteins and testosterone can be diagnostic criteria for aggression and suicide (130).

Aggression: genetics and other factors

Human behavior depends on many factors and if we already reviewed main causes of autoaggression – suicide – then we need to look at the causes of aggression directed towards other human beings, especially knowing the fact that in all world almost in all spheres amount of aggression is rapidly growing. And we all experience the outcomes of this aggression – beginning in family and ending on the level of global terrorism.

Usually it s though that impulsive /aggressive /antisocial behavior is related is related to low serotonergic activity (131). Aggression, neuroendocrine parameters and correlation of aggressions scale, evaluation of Hamilton depression scale were carried out in 100 people. Biochemical blood parameters, prolactine, testosterone, T3, T4, TSH, FSH, LH, 5-HIAA were also studied. It was observed that aggressive persons had lower 5-HIAA concentration, while concentration of testosterone was higher than in normal values. TSH concentration also was higher than normal. Conclusion – aggressors demonstrated lower serotonin serotonin metabolites concentration in urine, while in all studied their mediums glicemia was decreased and concentration of testosterone was above the normal (132). It was tried t find correlation between environmental factors and genetic indicators. Enzymes and hormones are primary indicators of genetic expression, which partially can clarify the deviations of behavior among separate individuals. Prolactin, growth hormone, melatonine and thyroidin as well as gonadal hormones are providing valuable information about behavioral peculiarities. Elements of genetic expression, environmental factors, neurodegeneration, cognitive functions from one side and such types of behavior as auto- and alloaggression, delinquency from the other are closely related (133). The influence of environment to immuno-endocrine function and behavioral features is obvious. It is established that long-time social isolation does not change markedly psychoneuroimmunological functions themselves, but organism reacts to stress more sensitively and stresses, stressful situations more frequently evoke aggressive actions of the individual

(134). When children under 4,5 year old were studied it was noticed, that main factor which determines development of non-aggressive personality is the binging up in the home under the maternal care. 4 groups of children who have spent 10, 30, 45 and more than 45 hours per week in the kindergarten were examined. Results of study have shown that the more time the child spends in company the more behavioral problems arise. And on the contrary, the more time child spends with his mother, the less conflicting personality develops. Higher educational status of the parents and greater family income were also favorable factors in suppression of children aggression manifestation (135).

Physiological and behavioral responses to stress are initiated when HHA axis is activated and as a result catecholamines and stress hormones glucocorticoids and adrenal hormones are released. Corticosteroids bind to the two intracellular receptors – mineral- and glucocorticoid- receptors (MR and GR). These receptors are distributed in CNS structures,which regulate fear, anxiety, learning – i.e. in hypocampus, amygdala, septum. The increased quantity of stress hormones is influencing processes of learning, memory as well as emotional reactions. If stress effect is short, then disturbances of spatial memory are also temporary. Long-term or chronic stress increase of glucocorticoid concentration and it can cause disorders of cognitive functions. For example, in the case of Cushing's disease, which is accompanied by higher concentration of glucocrticoids the signs of nerve atrophy in hypocampus and disturbances of cognitive functions are observed. All these disturbances can be reversible if adequate treatment is applied. Constant stress causes morphological reorganization: apical dendrites and length of pyramidal axons in CA3 subregion are changing. Such reorganization of neurons disturbs functions of learning and memory associated with hypocampus. Chronic stress changes also the morphology of amygdala with consequent changes in behavior: manifestations of fear and anxiety (clinical syndromes – exaggerated shyness, frightful children, melancholic depressions, PTSD, psychotropic drug abuse). Chronic stress even is able to suppress the will of fight of professional fighters (136).

In recent years much attention is devoted to interrelations between neuroendocrine, immune systems and behavior. Immune system in the course of evolution has developed in the organisms of vertebrates for the struggle with infection, which can be caused by microorganisms and tumors. Immune system is made of various types of cells, which activity

is controlled by complex communicational network whose main component – molecular proteins (interleukins). There are primary lymphoid organs – thymus and bone marrow and secondary – spleen, lymph nodes and lymphoidic tissue.

There are two types of immune reaction to microorganisms and neoplastic structures: a) nonspecific response, which involves physical barriers – skin, chemical defence (pH and enzymes), and internal agents – phagocytes-macrophages, killer lymphocytes; b) specific response, which possess cellular immunity (T-lymphocytes) and humoral immunity (B-lymphocytes). T-lymphocytes travel from bone marrow to the thymus, become mature, circulate in the blood, are deposited in the spleen and lymph nodes. Microorganisms stick to the T-lymphocytes, the interleukins initiate the production of lymphocytes and destroy the microbs. When cells of microorganisms are destroyed we have cellular immunity. B-cells gats mature in bone marrow. When microorganisms stick to the B-lymphocytes the latter through the chains of interleukins are cloned and turn into plasmic cells. Receptors from the surface of the cells float to the blood and become melting protein – antibody or immunoglobulin - and then destroy the antigens in the blood. This is humoral immunity.

Immune cells have receptors for hormones, neuropeptides and neurotransmitters, which are released by CNS as a reaction to cognitive impulses. Through the ligands – receptor interactions, endogenous substances affect immune responses: androgens, progesterone, ACTH are inhibiting immune system, while growth hormone, prolactin, thyroxin, insulin – activate. On the other hand primary and secondary lymphoid tissues have vast sympatic innervation. Nervous functions are influenced and regulated by immune cells, which in turn are affected by neuropeptides and neurotransmitters released by sympatic part of the nervous system. Immune system sends impulses via cytokins to CNS reporting about infection and starting CNS processes – release the norepinephrine in the hypothalamus and serotonin in hypocampus. These particular changes are responsible for neuroendocrine, behavioral, emotional and cognitive changes in the organism. The dependence of aggressive behavior on the immunological process is confirmed by large amount of data. The balance between immune response and aggression is related to energetic organism reserves. Aggression and immunological activity may have negative correlation. It also could be related to social, behav-

ioral status, i.e. we can suppose that male testosterone can inhibit immune system, therefore they are not so resistant to stress, microorganisms and oncological disorders. Positive correlation between stress and immune system is also possible. Aggression is a strategy directed to conquer partner, territory and to improve biological status. This is related to risk of trauma, disease, etc. Therefore the enhancement of immune system is necessary. Testosterone and aggression are inseparable. Small doses of testosterone increase aggression, resistance to infection, elevates the activity of immune system. Excessive doses of testosterone become as negative factor: too much risk, immune system is suppressed, organism is weakened and finally dies. Immunodepression can be also caused by low social status, looser-type personality, not-fighter type. Thus, immunodepression depends also on the psychological-nervous type of personality. Sex and the type of stress itself plays important role. On the other hand it was noticed that individuals with less expressed aggressive behavior are more resistant to tumors and virus infections (137).

FINAL REMARKS

Modern science is interested not only in how environment interacts with genetic inheritance and how individual characteristics are created, how these individuals are communicating in various social groups, but how in effect of these interactions the pathological changes and disorders evolves. It is very important to evaluate social status, education, conditions of work and living, style of life, behavior, stress factors from the one side and physical and psychiatric health from the other. Everyday life – eating in order to maintain normal activity, to have reserves for additional, sometimes unforeseen circumstances (compensation of stress, etc.), work, cycles, of day-night - all this request the balance of all organism systems: nervous, psychic, immune, genetic, endocrine. The stability of the organism, its homeostasis, must be maintained using minimal amount of energy and recourses. Homeostasis is viewed as unity of morphologic, physiologic and behavioral entities as well as resistance to daily, seasonal, accidental environmental changes. The factors on which stability, entirety depends and how these systems interact and communicate in order to maintain the unity of organism is described (138).

Organism is multilevel, extremely complex object, mainly exquisitely balanced and adequately reacting to environment changes. But, sadly, sometimes external or internal conditions and factors can break this mechanism and this can lead to various damages of the unity of the organism or even the threat to its existence.

LITERATURE

1. Christie M.J. Psychosomatics: an historical perspective. In: Nicholson J.,Foss B.M. (1983) Psychological Survey, N.4, pp.137-169. Leicester, BPS.
2. Lurie K. Stress changes Your brain. SciencentralNews. 07.01.2003.pp.1-2.
3. Powledge T.M.. Remodeling ideas about stress and the brain. http://news.bmn.com. 22.05.2003.pp.1-2.
4. Fuchs E., Michaelis T. Images from small brains provide neuroendocrine markers. p.35
5. Maltin.L.J. Stress causes Lasting Brain Changes. http://my.webmd.com/content/Article/24/2950_821.htm
6. Brain clue to stress disorder. http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/3051496.stm
7. Hayase T., Yamamoto Y., Yamamoto K., Muso E., Shiota K. Stressor like effects of cocaine on heat shock protein and stress-activated protein kinase expression in the rat hippocampus: interaction with ethanol and anti-toxicity drugs. Legal medicine, 5 (2003) S87-S90.
8. Gorji A. Spreading depression: a review of the clinical relevance. Brain Research Reviews, 38 (2001) 33-60.
9. Richardson J.S. On the functions of monoamine oxidase, the emotions and adaptation to stress. International Journal of Neuroscience. 70 (1-2) (1993) 75-84.
10. Roberto F.L. Dopamine-Glutamate interactions in the Pathogenesis of Schizophrenia.Current Opinion in Psychiatry,Vol.12, Suppl.1, 1999, p.286.
11. Angry outbursts linked to brain dysfunction. 27.05.2002. http://www.rewscientist.com/news/news.jsp?id=ns99992331

12. Vitkus A. Žmogaus širdies vystymasis embrioniniu laikotarpiu. Kaunas, 1998, psl.336.
13. Mann D. Depressed? You may be more likely to develop heart disease. http://my.webmd.com/content/Article/36/1728_62131.htm
14. Glassman A.H. Depression and the Course of Coronary Artery Disease. Current Opinion in Psychiatry, Vol.12,suppl.1,p.182, 1999.
15. Lederbogen F. Compromised Cardiovascular Regulation in Depression. Current Opinion in Psychiatry, Vol.12,suppl.1,p.182, 1999.
16. Musselman D. Exaggerated Platelet Activity in Major Depression. Current Opinion in Psychiatry, Vol.12, suppl.1,p.182, 1999.
17. Depression Hurts Heart Bypass Recovery. http://www.psycport.com/showArticle. 11.02.2003.
18. El-Rufaie O.E.F., Bener A.,Ali.T.A., Abuzeid M.S.O. Psichiatric Morbibdity Among Hypertenzive Men: A Controlled Study. Nordisk Journal of Psychiatry, 53 (1999) 41-44.
19. Denollet J., Sys S.U., Stroobant N., Rombouts H., Gillebert Th.C., Brutsaert D.L. Personality as independent predictor of long term mortality in patients with coronary heart disease. Lancet, 347 (1996) 417-421.
20. Winslow R. Heart Beat. http://online.wsj.com/article_email/0”SB104455800895997 9293,00.html 11.02.2003.
21. Chang P. Angry young men risk heart attacks. http://news.bbc.co.uk/1/hi/health/1939094.stm 04.22.21. 2002
22. Ham B., Writer S. Anger, anxiety may boost heart risk in postmenopausal women. http://www.hbns.org/news/anger07-07-03.cfn
23. Stoney C.Stress causes heart-damaging fats to stay in blood longer. http:/www.eurekalert.org/pub_releases/2002-02/osu-sch021102.php
24. Bulolock C., Francis M. Stress leaves blood vessels tightly wound. http://www.eurekalert.org/pub_releases/2002-05/aha-slb051602.php.
25. Stephens A. Love breaks your heart. http://www.thesun.co.uk/article/0“2001340001-2003070727“00.html
26. M.Meyer M. Stressed-out men may have inherited risk for early heart disease.

http://www.eurekalert.org/pub_releases/2003-03/hfhs-smm022803.php
27. Garber.F. Caregiving Wives Have More Heart Disease. http://my.webmd.com/content/Articles/61/67270.htm
28. Boehmer G. HearthMath Decodes Stress – The Last Taboo in Business. http://biz.yahoo.com/bw/030709/95159_1.html
29. Woodbury M. Working class feels greater blood pressure effects from stress. http://www.hbns.org/news/class03-07-03.cfm
30. Curtis B.M., O'Keefe J.H. Autonomic Tone as a Cardiovascular Risk Factor: The Dangers of Chronic Fight or Flight. Mayo Clinic Proceedings, 77 (2002) 45-54
31. Smith T.W., Ruiz J.M. Psychosocial Influences on the Development and Course of Coronary Heart Disease: Current Status and Implications for Research and Practice. Journal of Consulting and Clinical Psychology, 70 (2002) 548-568.
32. Merritt R.Stress Management significantly reduces long-term costs of artery disease. http://www.apa.org/practice/stressmanagement.html
33. Ouimet Ch. The gut has a mind of its own. http://www.globeandmail.com/servlet/ArticleNews/PEstory/TGAM/20021231/HETUMM/Healt
34. Szalavitz M. Gut Thoughts. http://news.bmn.com/hmsbeagle/119/notes/feature1
35. Philippens M. Stressed intestine can give rise to food allergy. http://www.eurekalert.org/pub_releases/2002-04/nofs-sic041802.php
36. Stress a Key Part of Binge Eating Lifestile. http:/www.psycport.com/showArticle.cfm?xmlFile=bhsuper%5F2003%5F03%5F14%5FTEVS
37. Spila B, Kosikowski W., Karakula W., Makara M., Karakula H.,Grzywa A. The relationship Between Psychosomatic Disorders and Anxiety, Depression and the Level of Self-Acceptance XI World Congress of Psychiatry, Abstracts Volume II, 1999, p.296.
38. Brambilla F. Dopaminergic Function in Anorexia Nervosa. Current Opinion in Psychiatry, vol. 12, suppl. 1, 1999,p.193.
39. Nichols H. Starvation stimulates the brain. http://news.bmn.com/news/story?day=030625&story=1

40. Straub R., Kaschka W.P, Harrer B., Konig F. Influence of Thyroid Disbalance in Depression XI World Congress of Psychiatry, Abstracts Volume II,1999, p.32
41. Bauer M. Adjunctive Thyroid Hormones in Depressive Disorder. Current opinion in Psychiatry,vol.12,suppl.1,1999, p. 348.
42. El Essawy H. Serum Leptini n Depression: A new Vulnerebility Marker. XI World Congress of Psychiatry, Abstracts Volume II, 1999, p. 31
43. Schweiger U., Heuser I., Fichter M. Low Bone Density in Men and Women with Psychiatric Disorder. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999. p.196
44. Robert M. Skeletal consequences of psychiatric Disorders. Current opinion in Psychiatry, Vol.12, suppl.1, 1999, p. 196.
45. Halbreich U.Similarities betweenOsteoporosis and Brain Processes. Current Opinion in Psychiatry, Vol.12, suppl. 1, 1999, p.196
46. Excessive worrying linked with longer time needed to improve psoriasis.
http://www.psycport.com/stories/newsrx_2003_07_03_engnewsrx_eng-newsrx_1424
47. Wilson N. Acne' made worse by stress.
http://news.bbc.co.uk/2/hi/health/3085951.stm
48. Joukamaa M. Depression and back pain. Acta Psychiatrica Scandinavica, 377 (1994) 83-86
49. Adams A. Depression and chronic pain linked in Stanford Study; may influence diagnosis and treatment.
http://www.eurekalert.org.pub_releases/2003-01//sumc-dac_1011503.php
50. Farrer S.R. Stress may trigger ms flare-ups in women.
http://www.cfah.org/hbns/news/flareups11-26-02.cfm
51. Finkelstein J.B. Ability to Cope with stress may play a role in cancer progression.http://www.hbns.org/news/coping12-01-02.cfm
52. Page S. When the body says no. Ottawa Citizen, 03.16.2003.
53. Halbreich U. Resolution of th Conflict Between Psychological and Biochemical Theories Current Opinion in Psychiatry, Vo.12, suppl.1, 1999, p. 330
54. Shridhar Sh., Chandra S.M.,Atul P. Sociocultural Aspects of Neuropsychiatry. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.330

55. Temple University Survey Shows Stress Levels Highest Since 9/11.
http://www.ascribe.org/cgi-bin/spew4th.pl?ascribeid=20030220.102238&time=11%2049%
56. Four groups of New Yorkers Still Suffer Stress After 9/11. http://www.psycport.com/stories/healthnewsdigest_2003_02_24_eng-healthnewsdigest
57. Substance abuse increases in New York city in Aftermath of September 11thhttp://www.sciecedaily.com/releases/2002/05/020529071330.htm
58. Riesenman S. Posttraumatic Stress More Common in Women Than in Men. Journal of Trauma Injury, Infection and Critical Care, 53 (2002) 882-887
59. Andrews M. Stress is up. Why are Menthal Health Benefits Down? The New York Times, 04.20.2003.
60. Onion A. Stressed out.
http://printerfriendly.abcnews.com/printerfriendly/Print?FetchFromGLUE=true&GLUEService
61. Yeager K.R., Roberts A.R. Differentiating Among Stress, Acute Stress Disorder, Crisis Episodes, Trauma and PTSD: Paradigm and Tretment Goals. Brief Treatment and Crisis Intervention, 3 (2003) 3-25
62. Dulmus C.N., Hilarski C. When Stress Constitutes Trauma and Trauma Constitutes Crisis: The Stress-Trauma-Crisis Continuum. Brief Treatment and Crisis Intervention, 3 (2003) 27-35
63. Deuschle M. Mineralocorticoid Receptor and Human HPA System Activity. XI World Congress of Psychiatry,Abstracts Volume II, 1999, p.31
64. Reul A., Gesing R.G.,Penalva A.,Bilang-Bleuel. Stress, serotonin and the hypothalamic-pititary-adrenocortical axis. Neuropsychpharmacology, 8 (1998), suppl.2,, pS105
65. McEven B.S The neurobiology of stress: from serendipity to clinical relevance. Brain Research, 886 (2000) 172-189
66. Chou-Green J.M., Holscher T.D.,DallmanM.F.,Akana S.F. Repeated stress in young and old 5-HT 2C receptor knockout mice. Physiology and Behavior, 79 (2003) 217-226

67. Ned Kalin. Primate model of Psychopathology: Psychoneuroendocrine Studies, Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.156.
68. Feldman S., Weidenfeld J. Depletion of hypothalamic norepinephrine and serotonin enhances the dexamethasone negative feedback effect on adrenocortical secretion. Psychoneuroendocrinology, 16 (1991) 397-405
69. Retana-Mrquez S., Bonilla-Jaime H., Vzquez-Palacios G., Domnguez-Salazar E., Martnez-Garca R., Velzquez-Moctezuma J. Body weight gain and diurnal differences of corticosterone changes in response to acute and chronic stress in rats. Psychoneuroendocrinology, 28 (2003) 207-227
70. Piatnitski N. The Comparative characteristics of mental disorders in the different endocrine diseases. Neuropsychopharmacologica Hungarica, III (2001),suppl.3,114-115.
71. Tanaka M. Yoshida M., Emoto H., Ishii H. Noradrenaline systems in the hypothalamus, amygdale and locus coeruleus are involved in the provocation of anxiety: basic studies. European Journal of Pharmacology, 405 (2000) 397-406
72. Griffin W.C.III, Skinner H.D., Salm A.K., Birkle D.L. Mild prenatal Stress in rats is associated with enhanced conditioned fear, Physiology and Behavior 79 (2003) 209-215
73. Our bodies, Our fears. Newsweek, 02.24.2003.
74. New depression studies reveal persistentSerotonin system abnormality in patients,
http://www.sciencedaily.com/releases/2002/05/020528074141.htm
75. Hatzinger M., Wojtak C.T., Keck M.E., Landgraf R., Hemmeter U., Holsboer –Trachsler E., Holsboer F., Neuman I. Hypothalamic-pituitary-adrenocortical-system alterations in aging and depression. Contribution of vasopressin to underlying pathophysiology. Neuropsychopharmacology, 8 (1998) suppl.2, S308
76. Baghai T.C., Schule C., Zwanzger P., Minov C., Zill P., Ella R., Eser D., Oezer S., Bondy B., Rupprecht R. Hypothalamic-pituitary-adrenocortical- axis dysregulation in patients with major depression is influenced by th insertion /deletion polymorphism in the angiotensin I-converting enzyme gene

77. Heintz A.,Hommer D.,Weingartner H., George D. Neurobiological Correlates of Depression in Abstinent Alcoholics, XI World Congress of Psychiatry, Abstracts Volume II, 19999, p.78
78. Weber B., Heuser I Endocrine-metabolic Risk Factors for Cardiovascular Diseases in Depressed patients, Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.182
79. Powledge T.M. Estrogen lifts depression in women, but only for some.
http://news.bmn.com/conferences/list/view?filyear=2003&fileacronym=ENDO&filed
80. Muller M.J., Netter P Influence of the controllability of labpratory stressors on salivary cortisol and testosterone in healthy young men. Current Opinion in Psychiatry, vol.12,suppl.1,1999, p.18
81. Sternbach H., Age-associated testosterone decline in men:clinical issues for psychiatry, American Journal of Psychiatry, 155 (1998) 1310-1318
82. Kolodub F., Palagina I. Functional status of pituitary-adrenal and pituitary-gonad under stressory impact of magnetic fields
83. Rodenbeck A. Enhanced Plasma Cortisol Reflects the Psychophysiological Arousal in Insomnia, XI World Congress of Psychiatry, Abstract Volume II, 1999, p. 196
84. Izgi H.B., Gokce C., Calis M., Turan T., Sofuoglu S., Kirnap M., Durak A.C., Tutus A., Kelestimur F. Investigation of the hypothalamo-pituitary-adrenal axis in patients with chronic fatigue syndrome
85. Reiter R.J., Vaughan M.K. Pineal gland. In: Endocrinology:People and Ideas. American Physiological Society,1988, pp. 215-238. Printed in USA
86. McKie R, Now science tells us how we really feel.
http://www.observer.co.uk/uk_news/story/0,6903,664899,00.html
87. Aza B.A new take on psychoneuroimmunology,
http://www.apa.org/monitor/dec0ą/anewtake.html
88. Kim Ritchey A. Chronic Psychological Stress and the Regulation of Pro-Inflammatory Cytokines: A Glucocorticoid –Resistance Model. Health Psychology, 21 (2002) 531-541
89. Clayton J. The nervous system lends a hand,
http://news.bmn.com/conferences/list/view?fileyaer=2002&fileacronym=ICN&fileday, 09.01.2002

90. Goehler L.E., Gaykema R.P.A., Hansen M.K.,Anderson K.,Maier S.F.,Watkins L.R. Vagal immune –tobrain communication: a visceral chemosensory pathway, Autonomic Neuroscience, 85 (2000) 49-59.
91. Levin A. Happy people may have more immunities to common cold.
http://www.eurekalert.org/pub_releases/2003-07/cfta-hpm071703.php
92. Gaillard R.C., Salvi R., Pralong F.P. Cytokines, leptin and the hypothalamo-pituitary-adrenal axis
93. Capozza K.L. Stressed Vets at higher risk for autoimmune diseases.
http://www.healthscout.com/template.asp?page=newsdetail&ap=1&id=512136
94. Fusfield J. Study finds perceptions of stressmay weaken immune system.
http://www.inform.umd.edu/News/Diamondback/archives/2002/12/05/news9.html
95. Farrer S.R. Stressful feelings may influence vaccine effectiveness. http://www.hbns.org/news/vaccine11-25-02.cfm
96. Clayton J. Link between childhood infection and stress?
http://news.bmn.com/conferences/list/view?fileyear=2002&fileacronym=ICN&fileday 09.03.2002
97. Heart-felt stress canbe more dangerous to immune system. http://www.sciencedaily.com/releases/2002/07/020711075312.htm
98. Ackenheil M., Scwartz M.J. Psychoimmunology – Quo Vadis? Current opinion in Psychiatry, Vol.12. suppl.1, 1999, p.304
99. Filion G., Grimaldi B. Serotonin and Neuroimunne Reciprocal Interactions. Current opinion in Psychiatry, Vol.12, suppl.1, 1999,p.304
100. Syvalahti E.K.G. Biological aspects of depression. Acta Psychiatrica Scandinavica, 377 (1994) 11-15
101. Schuld A., SchmidD., Haack M., Friess E., Pollmacher T. Does the activity of hypothalamo-pituitary-adrenal system in patients with depressive disorders influences neuroendocrine immune regulation
102. Miller A., Su C., Sanchez C., Pearce B., Pariante C. Cytokine effects on Glucocorticoid Receptors. Current Opinion in Psychiatry, Vol.12,suppl.1,1999, p.306

103. Freire-Garabal M., Mayan J.M., Nunez-Iglesias M.J.,Rey Mendez M., Varela M., Riveiro P.Stress and Immunity at the Workplace. Current Opinion in Psychiatry,Vol.12,suppl.1, 1999, p.209.
104. Schuld A., Haack M., Hinze-Selch D., Pollmacher Th., Kraus Th. Immunological effects of dexamethasone in MDE-Patients. XI World Congress of Psychiatry, Abstracts Volume II, 1999, p.292
105. Mgalolishvili B., Burkadze G. The pecularities of immune status in patients with schizophrenia. XI World Congress of Psychiatry, Abstracts Volume II,1999, p.193
106. Muller N., Schwartz M., Gruber R., Ridel M., Ackenheil M. The cytokine system in Schizophrenia : Effects of Disease and of treatment. Current opinion in Psychiatry, Vol.12, suppl.1 1999, p.308
107. Schwartz M., Ackenheil M.,Muller N, Riedel M. A Shift to Humoral Immune Response in Schizophrenic Patients. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.306
108. SpinneyL. Is epilepsy an autoimmune disorder? http://news.bmn.com/news/story?day=0304168&story=1, 04.15.2003
109. Riederer P., Blum-Degen D., Rossler M. Immunological changes in CSF and Blood of Alzheimer's Disease patients. Current Opinion in Psychiatry, Vo.12, suppl.1, 1999. p.34
110. Crow T. Sex differences are the Key to the Genetics of Psychosis and the Origins of Language. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.67
111. Yolken R.H., Faridi K., Karlsson H., Torry E.F., Johnston N., Leister F., Li S. RNA Expression in the brains of individuals with Schizophrenia, Bipolar disorders and other serious Psychiatric diseases. Current Opinion in Psychiatry, Vol.12, suppl. 1, 1999,p.191
112. Murray R.M., Wright P. Genes, viruses and neurodevelopmental Schizophrenia. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.306
113. Mann J. Neurobiological aspects of a stress diathesis model of suicidal behavior. 2nd International Meeting Suicide-Interplay of Genes and Environment.Abstract book, 2002, p.43
114. Farmer A., Marusic A. Could genetic risk factors account for the variation in suicide rates seen in European countries? 2nd Interna-

tional Meeting suicide-Interplay of Genes and Environment. Abstract book. 2002, p.25
115. Glowinski A.L., Heath A.C. Onset of suicidal behavior stratifying by co-twin history, zygosity and parental alcoholism:results from the Missouri adolescent female twin study. 2nd International Meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.30
116. Tomori M., Pacnik T. Suicide risk in clinical and non-clinical adolescent population. 2nd International Meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.38
117. Rihmer Z. Hierarchical classification of suicide risk factors: its practical importance for suicide prevention. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002. p.75
118. Lowther S., Katona C.L.E.,Crompton M.R., Horton R.W. The regulatory unit of protein kinase a in brain samples from depressed suicides. 6th World Congress of Biological Psychiatry.1997, abstract N. 14-168.
119. Anholcer M.B.Social and medical aspects of suicidal death among the elderly. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.62.
120. Schmidt U. Death, suicide and self-harm in eating disorders. 2nd International meeting Suicide-Interplay of Genes and Environment, Abstract book. 2002, p. 45.
121. Neelemean J. Suicidal behavior; epidemiological, psychological and physiological links with other health threats and implications for service organization. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p. 46.
122. Brunner J., Parhofer K.G., Schwandt P., Bronisch T. Cholesterol, essential fatty acids and suicide. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.76.
123. Voracek M., Kolves K., Rancans E., Gailiene D., Yip P.S.F., Sonneck G. Genes, suicide, and seasonality: evidence from the highest-ranking countries in suicide rate (Estonia, Latvia and Lithuania). 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p. 60-61.

124. Rujescu D., Giegling I., Moller H.J. Sistemic screen of serotonergic genes in suicidal behavior. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p. 28.
125. Courtet Ph., Buresi P., Baud P., Astruc B., Jollant F., Malafosse A. Molecular dissection of the serotonin pathway in suicidal behavior. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p. 29.
126. Becker U. Laakmann G., Baghai T.C., Kauert G. Direct CSF 5-HT and suicidality in different forms of depression.6th World Congress of Biological Medicine.1996, Abstract N.62-8
127. van Heeringen C. The Psychobiology of vulnerability. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.68.
128. Stefulj J., Furac I., Hranilovic D., Balija M., Kubat M., Jernej B. Tryptophan hydrolase gene polimophism (A218C) in violent suicide victims: age and sex influences. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p.31.
129. Sugden K., Marusic A., Balazic J., Avgustin B., Roskar S., Farmer A., McguffinP., Craig I. Suicides and non-suicidal deaths in Slovenia:molecular genetic study of risk factors for suicide. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book.2002.p.32
130. Anholcer M.B. Biological markers of the aggression. 2nd International meeting Suicide-Interplay of Genes and Environment. Abstract book. 2002, p. 33.
131. Hegerl U., Schmidt Lufz G., Gallinat J., Juckel G. Personality, Serotonin and Auditory –Evoked Cortical Neuronal Activity. Current Opinion in Psychiatry, Vol.12, suppl.1,1999, p.142
132. Cetin M., Cilden S., Basoglu C., Ebrinc S., Ozcubukcuoglu A., Evren C., Burkovik Y. Neuroendocrinergic and biochemical indicators of aggressive behavior and violence. Neuropsychopharmacology. 8 (1998) suppl.2, p. S313.
133. Shrivastava A.K.Recent Neuroendocrine Theories in Understanding Human Behavior. Current Opinion in Psychiatry, Vol.12, suppl.1, 1999, p.330.
134. Bartolomucci A, Palanza P., Sacerdote P., Ceresini G., Chirieleison A., Paneraic A.E. Prmigiani S. Individual housing induces altered

immuno-endocrine responses to psychological ctress in male mice. Psychoneuroendocrinology. 24 (2003) 540-558.
135. Duffy M.G. Child Care linked to assertive, noncompliant and aggressive behaviors. NIH News, 07.16.2003. http://www.nih.gov/news/pr/jul2003/nichd-16.htm
136. Wood G.E., Young L.T.,Reagan L.P., McEven B.S. Acute and chronic restraint stress alter the incidence of social conflict in male rats. Hormones and Behavior 43 (2003) 205-213
137. Aspiroz A., Garmendia L., Fano E., Sanchez-Martin J.R. Relations between aggressive behavior, immune activity and disease susceptibility. Aggression and Violent Behavior 8 (2003) 433-453.
138. McEven B.S., Wingfield J.C. The concept of allostasis in biology and biomedicine. Hormones and Behavior 43 (2003) 2-15.

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Translation from Lithuanian

SEXUAL VIOLENCE AGAINST WOMEN – ONE OF POSSIBLE CAUSES OF SUICIDE

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The research of the World Health Organisation (WHO) indicates that at least one of five women has experienced violence in their lives (WHO, 1998). Other studies suggest that this number is one out of three women (*Heise L. et al, 1999).* Sexual violence against women may have long-lasting psychological and physical consequences and have a negative impact on various aspects of the life of women such as psychological, legal or social aspects and may result in disordered physical and reproductive health of women (*Freedom from Violence: Women's Strategies from Around the World, 1992).*

The doctors and lawyers do not have a common position on how to help the victims of sexual violence. Until recently, the research of problems faced by the victims of sexual violence and the impact of such abuse on the reproductive and mental health of women were few and

sparse. It is obvious that the position of 'closed eyes' will not encourage any positive developments in this area. Therefore, it is necessary to create a comprehensive assistance system involving the joint efforts of psychologists, obstetricians-gynaecologists, forensic experts, and lawyers (*Perez – Conchillo M. et al, 1999).*

Recent WHO documents (2002) on the sexual and reproductive health strategy for the European region indicate the need to expand the definition of victims of violence.

All facts connected with sexual violence are conceived very differently because the registration and interpretation of the facts varies from country to country and depends on their respective cultures *(DeKeseredy W.S., 1995).*

The 1997 symposium of experts of the International Organisation of Obstetricians and Gynaecologists encouraged obstetricians and gynaecologists to stop feeling helpless or shocked by the complaints of victims and proposed three ways to overcome these psychological difficulties: by supporting the victims; by learning how to recognise victims and by providing expert medical services to victims of sexual violence, especially if a woman admits to being the victim it for the first time.

I. S. Moriyama (1999) states that the introduction of register of violence victims can ensure good medical and psychological help. However, this help cannot be well-organised if we do not know the actual degree of violence.

Sexual violence against women has its major impact on their reproductive health: a possibility of undesired pregnancy, they can contract sexually transmitted diseases, they may lose trust in men which is then reflected in frequent divorces and irregular relationship patterns (*Kornetov A. 1999).*

It is also obvious that the victims of sexual violence avoid any publicity, are reluctant to reveal the circumstances of abuse, feel as if it is their own fault. The multidisciplinary approach towards victims of sexual violence would be the impetus to develop standard programmes to help the victims (*Grimstad H. 2000).*

In recent years, Lithuania has widely debated about the victims of sexual violence in families and the entire society and about possible help. According to the findings of international representative victimological study carried out in Lithuania in 1997 by the specialists of Vilnius University, 71.4 percent of adult women, after reaching 16, in

Lithuania have at least once experienced sexual harassment by unknown men and 43.8 percent by the men they knew. Only 3.4 percent of women who were sexually harassed said that this assault had no impact on them. In Lithuania, women are exposed both to domestic sexual violence and to that of complete strangers. 26.5 percent of adult Lithuanian women, after reaching 16, were at least once exposed to sexual violence by unknown men. About 50 percent of Lithuanian women are reluctant to speak about sexual violence with law enforcement or health care officials (*Purvaneckas A., Purvaneckienė G., 1999).* The victim relies only on her closest surrounding, i.e. her family. If a woman contacts law enforcement authorities after she was sexually abused, she has to undergo two processes – the medical and the legal. The staff of health care institutions must assist the victim to facilitate the medical process and make it safe and useful. We should remember that obstetricians and gynaecologists deal with the victims of sexual violence on a daily basis, irrespective of the fact whether they ask their patients about that or not.

In 1999, the Japanese scholar, obstetrician and gynaecologist I. S. Moriyama, stated that, based on his professional experience, in Nara prefecture, Japan, the institutions of protection of women from sexual violence have teams consisting of an obstetrician-gynaecologist, lawyer, police officer and psychologist.

Sexual violence has a negative effect on women causing psychological despair and, in some cases, resulting in death *(Foa E.B., 1997).* The degree of sexual violence is rather high in all countries. The numbers of victims are higher in the countries with more frequently reported cases of sexual violence.

The majority of women do not contact any law enforcement or social authorities or medical staff because they do not trust them and say that they will only experience indifference towards them *(Pavilionienė A., Kanopienė V., 1997)*

In Lithuania, only 10.6 percent of all cases of sexual violence are reported to the police by the victims. The majority of them experienced anger, helplessness, sadness and other negative emotions *(Purvaneckas A., Purvaneckienė G., 2001).*

The analysis of suicide cases proved the existence of the direct link between the suicide acts and alcoholism and sexual violence *(Kornetov A., 1999).* Moreover, physical and sexual abuse of young women is one of the adverse factors which may lead to suicide. The likelihood of sui-

cidal thoughts among the victims of rape are 3 times higher than among women who have no such experiences *(Kornetov A., 1999).*

62 percent of respondents who used sexual violence said that they raped only because they were under the influence of alcohol. Among women who drank alcohol, the rate of reported cases was 10 percent higher than among those who did not drink *(Abbey A., Zawacki T., Buck P.O. et al, 2001).* 60 percent of all cases of violence in Lithuania involved people under the influence of alcohol and 40 percent of all cases of sexual violence were also connected with alcohol abuse.

The most common feelings among the raped women are the following: tremor in 96 percent, helplessness in 96 percent, anxiety in 96 percent, scare in 88 percent, horror in 80 percent, physical pain (in the area of genitalia) in 68 percent, headaches in 60 percent of raped women (*Forster B.1996).*

Long-lasting mental disorders are among the most serious but most difficult injuries to prove. There is a risk of epileptic fits *(Marshall L. L., 1994).* In the USA, more than 4 million women suffer from the post-traumatic stress syndrome acquired after cruel sexual abuse, rape or non-violent injury.

Abdominal pain is one of the reasons for women to visit their gynaecologist. Abdominal pains are often caused by the endometriosis, accretions in pelvis, pelvic inflammatory disease; however, in about 50 percent of the cases the cause is not detectable. In such cases the doctors should ask their patients about sexual violence because there is the direct link between the sexual abuse and chronic abdominal pains. It was proved that pains are more frequent in women who were exposed to sexual violence in childhood or are sexually abused at present *(Heise L. et al, 1995).*

The questions about family planning, pregnancy, reproductive health, sexual matters and physical symptoms can be used to promptly shift the discussion towards the issue of sexual violence. Asking questions is the first step towards liberation and getting rid of the secret and shame hidden inside. The breaking of silence can give hope *(DeLahunta E., 1996).*

About 11 percent of pregnant women who experienced sexual violence during their pregnancy are reluctant to see the doctor and do not report the abuse to their treating doctor *(Ballard T.J. et al, 1998).* Sexual violence can result in high-risk pregnancy, it often causes abdominal in-

juries resulting in the death of foetus or premature birth. The stress experienced during sexual violence may disturb the development of foetus because the increase in stress hormones has a negative impact on the nutrition of foetus in the uterus *(Gazmararin J.A. et al, 1996).*

Medical staff working in the areas of reproductive health, health of mother and her child, the pregnant women and antenatal health are very important in dealing with the victims of sexual violence. The research shows that the victims must trust the health care specialists because only then they are able to share their experiences of violence. The health care institutions must openly admit that a lot of women visiting the family planning clinics, clinics for pregnant women and child and mother health clinics are the victims of sexual violence and that it is a very important issue that must be discussed with the patients. Due to the fact that every woman is a potential victim of violence, each of them must be asked about that. Even when the staff is trained to recognise victims, the doctors are often unable to act because it should be a part of services provided by the institution. The doctors and general practice nurses must ask women about violence but they often don't. They state that they feel uncomfortable to raise this problem or they are afraid that the question about sexual violence my scare their patient or they don't know what to do if the answer would be "yes".

R. Carrillo (2002) said that the organisation of efficient help to victims of sexual violence is first and foremost based on the collection of data on the degree of sexual violence, the analysis of data, and the development of recommendations on national, regional and international level.

When asked about that, some administrators in Lithuania say that they are afraid that the problems and needs of victims of violence may overshadow all other activities. Thus they will not be able to perform their work assignments. Despite that, there are always means to include the solution of this problem into the existing programmes. If the personnel is trained to recognise and treat the victims of sexual violence, this work can be useful for the improvement of their professional skills, it may help the victims to break their isolation trying to hide their experiences, relieve or ease their feeling of guilt and increase the awareness of the link between their health problems and violence.

Vilnius Child Birth Centre used an anonymous target questionnaire about sexual violence to interview 300 women.

Vilnius Child Birth Centre is a health care institution providing obstetric and gynaecologic services to women. The annual number of patients treated is about 6,000.

The questionnaire consisted of questions about violence, its concept, types of violence: physical, psychological, financial violence. A large part of questionnaire contained questions about sexual violence starting from childhood or teenage years and during the adult life of women. We paid our attention to the duration of violence, if the abuser was under the influence of alcohol, what was the relationship between a woman and her abuser. The age range of surveyed women was 18 to 45 years. They are the women of fertile age. A number of questions were addressing such matters as the kind of knowledge these women have about violence, what is sexual violence, do they know where to contact in case of sexual violence, what would help them avoid thinking about violence and remembering it, whether they are unable to forget the ordeal.

180 women out of 300, i.e. 60 percent of those interviewed, indicated that they had experienced sexual harassment and sexual violence in their lives. 120 women stated that they've never been sexually abused. However, they are not well aware of what sexual violence, and especially domestic violence, is.

All 300 women wanted as much information about sexual violence as possible, they indicated the lack of information about violence and especially about sexual abuse. Almost 80 percent of interviewed women were unable to draw the line between the violence and non-violent family and public relations.

90 percent of interviewed women said that they would not know where to apply (except the police) in case of violence, where to seek psychological help, whereabouts of crisis centres for women.

When asked if anyone were touching them sexually in childhood, approximately 80 percent answered that they could not remember, about 15 percent said maybe and 5 gave positive answer.

30 percent of women were forced to have sexual intercourse even when they refused to do so.

None of them reported the abuse to law enforcement officers.

When asked if they were under the influence of alcohol, all women gave negative reply.

When asked about their experiences after the sexual violence, 5 percent of women said that they wanted to commit suicide, 15 percent felt ashamed and blamed themselves. 10 percent of women experienced the anxiety and panic attacks. One percent underwent treatment and psychological or psychotherapeutic counselling. The surveyed women indicated their conversations with girlfriends, family members and close friends as the most efficient help.

All 300 respondents kindly accepted the flyers about violence and the details where to apply in case of abuse. However, every other woman said that she would not likely need it but would give information to her friends.

CONCLUSIONS

1. 180 women (or 60 percent of all respondents) experienced sexual violence and abuse.
2. Of 300 women surveyed, 30 percent were forced to have sexual intercourse against their will.
3. 10 percent of women underwent anxiety and panic attacks after sexual violence, 5 percent of the respondents thought about committing suicide;
4. 70 percent of women would like to talk to psychologists or psychotherapists, physicians, doctors, forensic experts;
5. The medical staff are the most trusted;
6. Women don't have sufficiently clear and available information about violence, especially about sexual violence.

REFERENCES

1. Abbey A., Zawacki T., Buck P.O. et al. Alcohol and sexual assault // Alcohol Res. Health. – 2001, vol. 25, p. 43-51.
2. Agurcia C.A., Rickert V.I., Berenson A.B. et al. The behavioral risks and life circumstances of adolescent mothers involved with older adult partners // Arch. Pediatr. Adolesc. Med. – 2001, vol. 155, p. 822 – 830.
3. Beebe D.K. Emergency management of the adult female rape Victim // Am. Fam. Physician. – 1991, vol. 43, p. 2041-2046.

4. Bhatt R.V. Domestic violence and substance abuse // Int. J. Gynaecol. Obstet.- 1998, vol. 63, suppl. 1, p. S25-31.
5. DeKeseredy W.S. Enhancing the quality of survey data on woman abuse // Violence Against Women. – 1995, vol. 1, p. 158-173.
6. DeLahunta E.A., Tulsky A. Personal exposure of faculty and medical students to family violence // J. Am. Med. Assoc. – 1996, vol. 24, p. 275-278.
7. Faundes A., Andalft J. Sexual violence against women. The role of gynecology and obstetrics societies in Brazil // Int. J. Gynecol. Obstet. – 2002, vol. 78, suppl. 1, p. 67-73.
8. Foa E.B. Trauma and women: Course, predictors and treatment // J. Clin. Psychiatry.- 1997, vol. 58, p. 25-28.
9. Freedom from Violence: Women‘s Strategies from Around the World / ed. M. Schuler; United Nations Development Fund for Women. – New York, 1992, p. 8-11.
10. Gailienė D. Savižudybių prevencijos idėjos. – V., 2001, p. 118-119.
11. Gazmararian J.A., Lazorick S., Spitz A.M. et al. Prevalence of violence against pregnant women // J.Am.Med. Assoc. – 1996, vol. 75, p. 1915-1916.
12. Grimstad H. Violence Against Women and Pregnancy Outcome. – Oslo, 2000, p. 49-60.
13. Heise L., Ellsberg M., Gottemoeller M.A global overview of gender-based violence // Int. J. Gyncol. Obstet. – 2002, vol. 78, suppl. 1, p. 5-14.
14. Heise L., Ellsberg M., Gottemoeller M. Ending Violence Against Women Population Reports. Series L. No. 11. – Baltimore: Johns Hopkins University school of Public Health, 1999, p. 16-17.
15. Heise L., Moore K., Taubia N. Sexual Coercion and Reproductive Health. – New York: The Population Council, 1995, p. 8-9.
16. Hynes M., Sheik M., Wilson H.G., Spiegel P. Reproductive health indicators and outcomes among refugee and internally displaced persons in postemergency phase camps // JAMA. – 2002, vol. 288, p. 595-603.
17. Kornetov A. Sexual and physical abuse in young suicidal females // XI World Congress of Psychiatry. – Hamburg, 1999, pt 2, p. 310, abstr. 53.
18. Lietuvos Sveikatos programa 1997-2010 m. / LR Sveikatos apsaugos m-ja. – V., 1998, p. 22-25.

19. Marshall L.L. Physical and psychological abuse // W.R. Cupach, B.H. Spitzberg. The Dark Side of Interpersonal Communication. – Hillsdale: Lawrence Erlbaum Associates, 1994, p. 281-311.
20. Pavilionienė A., Kanopienė V., red. Smurtas prieš moteris ir vaikus Lietuvoje. – VU Moterų studijų centras, V., 1997, p. 37-40.
21. Perez-Conchillo M., Aminta D.C., Eusebio R. Valencia declaration on sexual rights // Curr. Opin. Psychiatry. – 1999, vol. 12, p. 146-149.
22. Purvaneckas A., Purvaneckienė G. Moteris Lietuvos visuomenėje (palyginamoji tyrimų analizė). – V., 2001, p. 130-132.
23. Purvaneckienė G. Smurtas prieš moteris: viktimologinio tyrimo ataskaita // Smurtas prieš moteris Lietuvoje. – V., 1999, p. 90-136.
24. Stevens L. „A Practical Approach to Gender-Based Violence: A Programme Guide for Health Care Providers and Managers“ developed by the UN Population Fund // Int.J.Gynecol.Obstet.-2002, vol. 78, suppl. l,p. 111-117.
25. Moriyama I.S. Japan experience as a gynecologist in supporting victims of sexual violence // Violence and Health Proceedings of a WHO Global Symposium.- Kobe, Japan, 1999, p. 348-350.
26. Ballard T.J. Saltzman L.E., Gazmararian J.A. et al. Violence during pregnancy measurement issues // Am.J. Public Health.- 1998, vol. 88, p. 4-6.
27. Carrillo R. Overview of international human rights standards and other agreements and responses of the judicial system to violence against women // Int. J.Gynecol. Obstet.-2002, vol. 78, suppl. l, p. 15-20.
28. Mačiulienė. K. Medicinos mokslų daktaro disertacija „Seksualinė prievarta ir pasekmės moters reprodukcinei sveikatai“. 2003 m.
29. Forster B.Praxis der Recht medizin fur mediciner und juristen – Munchen: CH Beck’sche verlags buchhandlung. Miunchen 1996 m., 523.

POST-TRAUMATIC STRESS DISORDER

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INTRODUCTION

Clinicians have recognized juxtaposition of mental syndromes to traumatic events for more than 200 years. Observations of trauma-related syndromes were documented by psychoanalists, including Freud, and the relation between neurosis and trauma was mentioned. Interest in post-traumatic mental disorders was stimulated by observations of "battle fatigue", "shell shock" and soldier's heart" (1). Trauma-related events first of all disturb emotions, and emotional intelligence is transformed. What does it mean to be emotionally intelligent? To be emotionally intelligent is to have the personal skills that characterize a rich and balanced personality. Emotional intelligence includes, as Aristotle put, the rare ability "to be angry with the right person, to the right degree, at the right time, for the right purpose, and in the right way" (1).

Referring on long term experience there was a need to formulate a diagnosis, which could be proper for those individuals who experienced trauma-related events. For this purpose the diagnostic category of "post-traumatic stress disorder (PTSD)" was introduced into a formal classification of mental disorders in 1980 in *DSM-III*. However, it was accepted with some skepticism. Referring on various references and clinical experience we conclude that PTSD did not appear spontaneously. It was a consequence of progress and development of psychiatry. In the first edition of the *Diagnostic and Statistical Manual*, published in 1952,

stress response syndrome was listed under the heading of "gross stress reactions." In its second edition in 1968 trauma-related disorders were conceptualised as just one example of situational disorders. *DSM-III*, published in 1980 (2), listed PTSD as a subcategory of anxiety disorders. In the *DSM-IV*, published in 1994, and in DSM-IV-TR(2), published in 2000, PTSD is also listed in subcategory of anxiety disorders. In the ICD-10 [The Tenth Revision of the International Classification of Diseases and related Health problems (4)] PTSD is listed in subcategory "Neurotic, stress-related and somatoform disorders" in the section "Reaction to severe stress, and adjustment disorders".

Presently PTSD as specific mental disorder has the important place in the current classifications of mental disorders. PTSD is now being considered in relation to many trauma-inducing experiences such as rape, abuse, disasters, accidents, torture, even dangerous work condition and others.

The importance and the place of PTSD was based on:

1. Extended focus of modern psychiatry on non-psychotic disorders and their impact on individuals' autonomy and well being;
2. Increased social awareness regarding human rights, violence, disasters and their consequences;
3. A recent emphasis of the neurobehavioral sciences on brain plasticity and gene expression, and the paradigmatic role of traumatic events as triggering such reactions (5).

EPIDEMIOLOGY

PTSD is a worldwide clinical problem. Estimates of its incidence vary widely between studies and geographic regions. The lowest lifetime prevalence has been noted in Germany, with only 1% of males and 2.2% of females suffering from the disorder. These rates are considerably lower than the 7.8% overall rate noted in the US National Comorbidity Study by Kessler and colleagues(6). Survivors of war or mass violence in low-income countries manifest much higher rates of PTSD. The post conflict rates were estimated to be 37.4% in Algeria, 28.4% in Cambodia, and 17.8% in Gaza(7). Unfortunately, there are no studies on incidence of PTSD in Lithuania. However there are groups of population who survived extreme traumatic events. The major groups are: Chernobyl accident rescuers, Afghanistan war soldiers, participants of

events of January 13th in 1991, etc. Lithuanian psychiatrists face patients with PTSD from the groups mentioned above.

PTSD is frequently under-recognized and therefore often goes untreated. In a general survey in Israel, 9% of patients in a primary care setting were found to have PTSD. However, only 2% of the sample was recognized as having the disorder (8). Despite this lack of recognition, more than 80% of men and 92% of women with PTSD in this survey reported significant distress from the disorder. Even individuals with "subthreshold" symptoms who do not meet full diagnostic criteria for the disorder suffer from significant impairment, including increased suicidal ideation and poor quality of life. PTSD has serious influence on quality of life of the patients suffering from this disorder.

RISK FACTORS FOR PTSD

The risk factors for PTSD are reviewed from different points of view in the last decade. The main points are: influence of trauma related events and influence of neurobiological factors. The risk factors for the development of PTSD from a neurobiological perspective are new attitude on PTSD based on new data in neuroscience (9). Influence of trauma related events on individuals were studied more often.

One study based on a community sample found that 60.7% of men and 51.2% of women had been exposed to a traumatic event in the past. The rate of PTSD in women, however, was more than twice that occurring in men (20.4% vs. 8.1%) (6). The nature of the trauma suffered by men and women differed, with women exposed to rape much more frequently and men exposed to higher rates of combat and disasters. Although women are exposed to rape 10 times more frequently than men are, the rate of development of PTSD after rape is not statistically higher in women compared with men This suggests that it may be the rate of exposure to rape rather than constitutional differences between men and women that determine the development of the syndrome (6). Several characteristics of a traumatic event influence the rate of subsequent development of PTSD. Some of these factors include:

- Degree of controllability and predictability of the event;
- Ability of the victim to control the outcome and minimize injury;
- The extent of the actual loss;
- Exposure to intense noxious elements such as pain, cold, or heat;

- The sense of failure related to the inability to avoid or minimize the circumstances related to the event.

Following a traumatic event, a majority of those exposed may experience posttraumatic symptoms. However, after 9 to 12 months, 15% to 25% continue to be disturbed by symptoms. This group with persistent symptoms may have distinct psychological, social, or biological factors that determine the presence of these ongoing problems. A meta-analysis of risk factors was conducted and it was found that gender, psychiatric history, history of child abuse, and prior adversity played a role in the development of PTSD (10). More important factors, however, were the severity of the trauma, ongoing stress, and lack of current social support.

DIAGNOSTIC CRITERIA OF PTSD

The specified diagnostic criteria for mental disorders offer guidelines for making diagnosis and use of such criteria enhances agreement among clinicians and investigators. Diagnostic approach is basically descriptive both in DSM or ICD.

As other disorders of the Diagnostic and Statistical Manual of Mental Disorders (DSM), the definition of PTSD is essentially phenomenological, that is, based on the presence of specific symptoms in an individual. DSM **III** and the subsequent DSM-IV and DSM-IV-TR and International Classification of Diseases, Tenth Edition (ICD-I0) does not discuss the pathogenic or pathophysiological mechanism of PTSD.

The data on web page www.mentalhealth.com the description of PTSD subdivides into two approaches: European and American. European diagnostic evaluation is based on ICD-10 diagnostic guidelines. American diagnostic approach mentioned in www.mentalhealth.com is based on DSM-IV diagnostic criteria (American Psychiatric Association).

Referring on ICD-10 PTSD arises as a delayed and/or prolonged response to a stressful event or situation (either short- or long-lasting) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone (e.g. natural or man-made disaster, combat, serious accident, witnessing the violent death of others, or being the victim of torture, terrorism, rape, or other crime). ICD-10 presents data on predisposing factors such as personality traits (e.g. com-

pulsive, asthenic) or previous history of neurotic illness. Mental disorders and disturbances may lower the threshold for the development of PTSD or may aggravate its course, but they are neither necessary nor sufficient to explain its occurrence. Typical symptoms include episodes of repeated reliving of the trauma in intrusive memories ("flashbacks") or dreams, occurring against the persisting background of a sense of "numbness" and emotional blunting, detachment from other people, unresponsiveness to surroundings, anhedonia, and avoidance of activities and situations reminiscent of the trauma. Commonly there is fear and avoidance of cues that remind the sufferer of the original trauma.

In a normal response to fear, the sympathetic nervous system, parasympathetic nervous system, and HPA axis return to normal within several hours. Long-term effects often occur if the individual has experienced a previous serious stressor. That is, the brain has a memory for previous stress that may sensitise the brain to subsequent trauma.

According phenomenological description presented in ICD-10, there may be dramatic, acute bursts of fear, panic or aggression, triggered by stimuli arousing a sudden recollection and/or re-enactment of the trauma or of the original reaction to it.

A state of autonomic hyperarousal with hypervigilance, an enhanced startle reaction, and insomnia is usual. Anxiety and depression are commonly associated with the above symptoms and signs, and suicidal ideation is not infrequent. Recent studies presents data on PTSD and suicidal ideation. Research on PTSD in parents who have lost their children in the following three types of violent death: accidents, homicides, and suicides confirm correlation between PTSD and suicidal ideation. (11). Even subthreshold PTSD symptoms were associated with greater impairment, comorbidity, and suicidal ideation (12). Another important associated feature of PTSD is excessive use of alcohol or drugs. This could be a complicating factor.

The onset of PTSD follows the trauma with a latency period, which may range from a few weeks to months (but rarely exceeds 6 months). The course is fluctuating but recovery can be expected in the majority of cases. In a small proportion of patients the condition may show a chronic course over many years and a transition to an enduring personality change.

Diagnostic Guidelines according ICD-10

This disorder should not generally be diagnosed unless there is evidence that it arose within 6 months of a traumatic event of exceptional severity. A "probable" diagnosis might still be possible if the delay between the event and the onset was longer than 6 months, provided that the clinical manifestations are typical and no alternative identification of the disorder (e.g. as an anxiety or obsessive-compulsive disorder or depressive episode) is plausible. In addition to evidence of trauma, there must be a repetitive, intrusive recollection or re-enactment of the event in memories, daytime imagery, or dreams. Conspicuous emotional detachment, numbing of feeling, and avoidance of stimuli that might arouse recollection of the trauma are often present but are not essential for the diagnosis. The autonomic disturbances, mood disorder, and behavioural abnormalities all contribute to the diagnosis but are not of prime importance.

The late chronic sequelae of devastating stress, i.e. those manifest decades after the stressful experience, should be diagnosed as enduring personality changes after catastrophic experience.

Diagnostic criteria according DSM-IV-TR

A. The person has been exposed to a traumatic event in which both of the following were present:

1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
2. the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
2. recurrent distressing dreams of the event. In children, there may be frightening dreams without recognizable content.
3. acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucina-

tions, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.

4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
5. physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. efforts to avoid activities, places, or people that arouse recollections of the trauma
3. inability to recall an important aspect of the trauma
4. markedly diminished interest or participation in significant activities
5. feeling of detachment or estrangement from others
6. restricted range of affect (e.g., unable to have loving feelings)
7. sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. difficulty falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response

Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

PTSD is subdivided:

- Acute: if duration of symptoms is less than 3 months
- Chronic: if duration of symptoms is 3 months or more

Specify if:

- With Delayed Onset: if onset of symptoms is at least 6 months after the stressor

SEVERITY AND COMORBIDITY OF PTSD

Chronic form of PTSD is a debilitating mental disorder, associated with significant disability and malfunction. The severity of PTSD symptoms in individual patients can be different. Patients with chronic PTSD very often are sensitive to ongoing environmental stressors, and their reactions could be increased by distress, anger, isolation and use of medication or alcohol. The environment within which chronic PTSD patients live (for example, stable family, good working environment) may significantly affect the expression of PTSD symptoms and patient's response to treatment interventions.

Comorbidity of PTSD with other mental disorders is very common, especially with major depression, anxiety disorders and substance abuse. The US National Comorbidity survey found that 88.3% of men and 79% of women with PTSD experience at least one of other mental disorders (6). Depression is experienced by about one-half of all PTSD subjects (48.5% in women and 47.9% in men). Anxiety disorders are seen in more than one-third, drug and alcohol abuse by a third of all women and half of all men. Data on comorbidity are presented in the following table (5):

Table 1. **Prevalence and co-occurrence of post-traumatic stress disorder (PTSD) and depression**

Author	Population	*n*	PTSD (%)	Depression (%)	Overlap (% Of PTSD)
Shore et al 198960	Community sample: Mt St Helen disaster	274	3	NA	51.3
Green et al 199061	Vietnam veterans	200	29	15	34.5
Engdahl et al 199162	World War II prisoners of war	62	29	25.8	61
McFarlane and Papay 199263	Fire fighters	398	18	10	51
North et al 199464	Survivors of mass Shooting	136	26	10.2	30.1
Kessler et al 199535	Population sample	5877	7.8	17.9	48.2
Bleich et al 199765	Israeli war veterans	60	87	50	56

Unfortunately, there are no epidemiological data on comorbidity of PTSD with other mental disorders in Lithuania. In everyday clinical practice psychiatrists and other mental health professionals meet patients with PTSD and comorbid disorders. Clinical impression is that PTSD is comorbid with major depression and substance abuse or addiction.

Comorbidity of PTSD with somatic diseases is also important issue. There are few data on comorbidity of PTSD with some conditions. One study examined the comorbidity of posttraumatic stress disorder (PTSD) following myocardial infarction (MI). The results were that 6 % of the respondents had both acute stress disorder (ASD) and PTSD, 10% did not have ASD but did have PTSD, and 12% had ASD but not PTSD. (13) The data of 73 patients after trauma surgery revealed that somatic symptoms occurred frequently and were significantly greater after 12 moths in patients with higher levels of PTSD and depressive symptoms. (14). Comorbidity of PTSD with somatic conditions needs more research.

ACUTE AND CHRONIC PTSD

Another controversial matter is the subdivision of PTSD into acute (duration of symptoms less than 3 months) and chronic (duration of symptoms more than 3 months) subtypes. There are references, which subdivide PTSD into two forms mentioned above (3), and there are opinions that these two subtypes are identical. The same symptoms could develop in some months, half a year or more (15, 16). Acute PTSD (between 1 and 3 months) basically has no important clinical usefulness (no specific therapy or management). The clinicians are advised to manager in the same way both acute and chronic PTSD (5).

According ICD-10(4) only small number of individuals develops PTSD with chronic course. Others develop trauma-induced personality changes. Usually individuals, who develop severe form of PTSD, more often develop later on pronounced personality changes. The degree to which traumatic events can affect personality structures is a subject of discussion. ICD-10 included enduring personality changes resulting from exposure to 'catastrophic stress'. The stress must be so extreme that it is unnecessary to consider personal vulnerability in order to explain its profound effect on personality. The events include concentration camp

experiences, torture, hostage situation, disasters, and prolonged exposure to life-threatening circumstances, including occupational life threatening circumstances. Enduring personality change after catastrophic experience includes the following (4):

1. A hostile or mistrustful attitude towards the world (those individuals are suspicious, they accept majority of circumstances being dangerous etc.);
2. Social withdrawal (the ability to make and to have social or occupational contacts is limited);
3. Feeling of emptiness or hopelessness (usually they are pessimistic and feel themselves frustrated);
4. A chronic feeling of being “on edge’, as if constantly threatened (they feel tiredness, tension, fear);
5. Estrangement (very often they tell that only those individuals who experienced the same or similar trauma related events could understood them; for this reason they keep distance to others).

This personality change must be for at least 2 years after preexisting PTSD. Discussion of trauma-induced personality change is complicated by some circumstances of the current view of mental disorders. Indeed, the boundary between 'personality' and the very chronic mental disorders is not well defined. Moreover, PTSD symptoms of pervasive avoidance, irritability, increased stimulus responsivity and restriction to one's life are very likely to be perceived, by the patient and by the family, as changes to his or her 'personality'. Referring on the experience of clinicians one of the most frequent complaints of PTSD patients is 'I am not the same'. The impression of an association between PTSD and profound personality changes may result from clustering of treatment-resistant PTSD patients or patients whose PTSD is particularly complex and whose life circumstances are particularly unfavorable.

PTSD AND BRAIN ANATOMY

Many neurobiological systems are involved in mediating the response to trauma. The amygdala helps to initiate the fight or flight response, and several systems - including the sympathetic and parasympathetic systems and the hypothalamic-pituitary axis (HPA) - are subsequently mobilized. The sympathetic nervous system releases adrenaline, resulting in increases in heart rate, blood pressure, and glucose levels.

Corticotrophin-releasing factor (CRF) is released from the hypothalamus, and adrenocorticotropic hormone (ACTH) is subsequently secreted from the pituitary. Cortisol is then released from the adrenal gland. Cortisol plays a central role in mobilizing and mediating the stress response. In a normal response to fear, the sympathetic nervous system, parasympathetic nervous system, and HPA axis return to normal within several hours. Long-term effects often occur if the individual has experienced a previous serious stressor. That is, the brain has a memory for previous stress that may sensitize the brain to subsequent trauma.

In response to acute stress, cortisol levels rise. Increased cortisol levels have also been noted in patients with depression. Contrary to what might be expected, individuals developing PTSD actually have lower cortisol levels after a traumatic event (17).

PTSD is a mental disorder, which usually occurs after a severe stressful event. Acute stress is known to result in a physiological response which is mediated in part by monoaminergic systems (noradrenaline, dopamine and serotonin) in the short term and by the hypothalamic-pituitary-adrenal (HPA) axis in the longer term. (5) Stress results in increased glucocorticoid (GC) concentration in plasma and brain. Much attention has been devoted to the noxious effects of increased GC on neurons, particularly in the hippocampus where it is thought that persistently high GC concentrations induce reversible atrophy of the dendritic spines In PTSD severe stress is experienced repeatedly over a period of months, first because of the incident itself and then through the reexperience of the traumatic events which causes considerable distress. This process is followed by neurotoxicity where, over the course of months, high GC concentrations kill hippocampal neurons. These observations lead to the conclusion that prolonged periods of stress, leading to increased GC concentration, result in hippocampal atrophy in man a theory supported by findings in depression (which is accompanied by HPA axis abnormalities in many patients), where atrophy is correlated with total period of illness (18, 19)**.**

The past decade has seen the application of neuroimaging techniques to study the effects of stress and look for changes in brain circuitry and morphology in PTSD patients. Computed tomography, magnetic resonance imaging (MRI), positron emission tomography (PET), and functional MRI have been successfully used in this endeavor, with a specific focus on the hippocampus and the amygdala. Utilizing increas-

ingly sophisticated brain imaging techniques, the neurocircuitry involved in PTSD is being elucidated (20,21). Neuroanatomical regions that are thought to be involved in PTSD are the following:

- *Amygdala*. The amygdala is involved in intense emotional states such as fear responses.
- *Medial prefrontal cortex*. This cortical prefrontal region plays a modulating role, tempering or organizing the emotional response to trauma.
- *Hippocampus*. The hippocampus is involved in declarative memory as well as spatial and contextual memory. This structure serves as a context modulator and helps the individual to identify places and events associated with past negative experiences. Animal models have shown that chronic stress can cause injury to this structure (22).

It is hypothesized that PTSD may be caused by increased activation of the amygdala or failure of the modulatory action of the medial prefrontal cortex. In PTSD the fear response is generalized to other situations and the individual becomes hyperstimulated when this is not warranted.

There are some data that hippocampal volumes are smaller in adults with PTSD (23). However, a prospective study (24) did not show smaller hippocampal volumes at 1 week or at 6 months in individuals developing PTSD after a traumatic event. One study found (25) that there are no differences in hippocampal volumes of children at least 2 years after follow-up. Different data reveals that there is a need for more studies on hippocampal volume in individuals with PTSD.

Patterns of activation of the brain related to PTSD may be revealed using the positron emission tomography (PET) scan and functional magnetic resonance imaging (fMRI) (26). Symptom provocation studies designed to expose the individual to reminders of the trauma have been utilized to stimulate involved areas. Increases in activation of the amygdala, anterior cingulate, anterior paralimbic regions, and visual cortex have been noted. Alternatively, decreased activation in Broca's area has been observed. Broca's area is involved in verbal output, and this may explain the problems some individuals with PTSD have with verbalization of issues related to the event.

In order to determine whether amygdala activation is present in PTSD independent of deficiencies in prefrontal inhibition, a "masked

faces" paradigm has been utilized (27). Fearful and happy faces were briefly shown embedded in a longer presentation of neutral faces. The individual is consciously aware of seeing only a neutral face. Nevertheless, activation of the amygdala occurs by the viewing of these unconsciously processed affectively laden images. The magnitude of the amygdala activation on fMRI varied with the severity of the PTSD symptoms. This suggests that exaggerated activation of the amygdala is at least 1 of the factors involved in this disorder. Activation of the amygdala was not seen in patients with obsessive-compulsive disorder (OCD).

Thus, the triad of proposed structural deficiencies noted in PTSD is as follows:

- Amygdala hypersensitivity is present and may be assessed by the masked faces test. This hypersensitivity results in increased fear and emotional responses that may overwhelm the individuals' modulating systems.
- The hippocampus may be smaller or less active. This may result in deficient cognitive processing of memories and, therefore, the individual is more inclined to act on emotional stimuli.
- The anterior cingulate is hypoactive. The decreased activity results in failure of the cortex to modulate the responses of the amygdala and less cognitive control.

TREATMENT OF POST-TRAUMATIC STRESS DISORDER

Modern concept of PTSD emphasises that this disorder is a psychobiological phenomenon involving neurobiological dysregulation and psychological dysfunction. PTSD may be reversed by specific pharmacotherapeutic and psychotherapeutic intervention.

Treatment of PTSD relies on a multidimensional approach, including supportive patient education, psychosocial treatments and pharmacotherapy.

Treatment of PTSD includes the following:

1. Psychosocial treatments;
2. Pharmacotherapy.

Some advances have been made in the past decade with respect to group therapy, individual psychodynamically oriented therapy and cognitive-behavioural therapy. Some traditional interventions are also used

to treat PTSD. A number of case studies have reported that hypnosis was useful in treating post-traumatic disturbances but most of these reports lack methodological reliability and strong conclusions cannot be drawn. Psychodynamic psychotherapy was applied to treat PTSD as well. However, most studies of psychodynamic psychotherapy had methodological flaws, including lack of controls, lack of adequate assessment of outcome (5). Cognitive-behavioural therapy (CBT) includes a variety of treatment programms, including exposure procedures, cognitive restructuring procedures, anxiety management programms or their combination (28). Reviews of the extent literature are quite positive regarding CBT.

Studies of the pharmacotherapy of PTSD have focused primarily on antidepressants. The first studies were on tricyclic antidepressants (TCA) and monoamine oxidase inhibitors (MAOI), more recent studies selective serotonin reabsorbtion inhibitors (SSRI). The most recent studies were on new antidepressant mirtazapine, which is noradrenergic and specific serotonergic antidepressant (NASSA).

Several open studies investigating the role of the SSRIs in the treatment of PTSD have been published in the past decade (29, 30, 31, 32, 33). SSRIs could be agents of choice because of their safety and tolerability. There is stronger evidence for the use of antidepressants than for any other class of psychotropic medications. A recommendation to use antidepressants seems reasonable referring on the comorbidity of PTSD, which often includes major depression and other anxiety disorders (34, 35).

Maintenance pharmacotherapy and antidepressant discontinuation in PTSD have not been well studied. Given that structural changes have been associated with PTSD, it might be hypothesized that a cautious approach, with patients receiving at least a year of treatment before discontinuation, should be suggested.

Several other agents have been suggested as useful for treatment of PTSD. These agents include buspirone, some novel antipsychotics, thymoleptics (lithium, carbamazepine and valproates), benzodiazepines (5).

Preliminary open-label findings suggest that the selective GABA reuptake inhibitor tiagabine may be a promising therapeutic option in the treatment of PTSD as well (36).

PTSD is a major psychiatric problem with all the individual and social costs. There is a growing recognition of the scale of the problem that it presents. There is a great need for more and better treatments and for better understanding how treatments work.

REFERENCES

1. Kaplan and Sadock's comprehensive textbook of psychiatry/VII/ed. Sadock BJ, Sadock VA. 7th ed. 2000 by Lippincot Williams and Wilkins.
2. Diagnostic and Statistical Manual of Mental Disorders, 3rd ed. Washington, DC. American Psychiatric Association, 1980.
3. Diagnostic and Statistical Manual of Mental Disorders, 4th ed., Text Revision.Washington, DC, American Psychiatric Association, 2000.
4. The ICD-10 clasification of mental and behavioural disorders: clinical description and diagnostic guidelines. World Health Organization, 1992.
5. Post-traumatic Stress Disorder. Ed. Nutt D, Davidson JRT, Zohar J. Martin Dunitz Ltd, 2000.
6. Kessler RC, Sonnega A, Bromet E et al. Post-traumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995; 52:1048-60.
7. de Jong JT, Komproe IH, Van Ommeren M et al. Lifetime events and post-traumatic stress disorder in 4 post- conflict settings. JAMA 2001; 286:555-62.
8. Taubman-Ben-Ari O, Rabinowitz J, Feldman D et al. Post-traumatic stress disorder in primary-care settings: prevalence and physicians' detection. Psychol Med 2001; 31:555-60.
9. Yehuda R. Risk and resilience factors in PTSD. Program and Abstracts of the American Psychiatric Association. 155th Annual Meeting; May 18-23, 2002; Philadelphia, Pennsylvania. Industry-supported Symposium No. 13A.
10. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for post-traumatic stress disorder in trauma-exposed adults. J Consult Clin Psychol 2000; 68:748-66.

11. Murphy SA, Tapper VJ, Johnson LC et al. Suicide ideation among parents bereaved by the violent deaths of their children. Issues Ment Health Nurs 2003; 24(1):5-25.
12. Marshall RD, Olfson M, Hellman F et al.Comorbidity, impairment, and suicidality in subthreshold PTSD. Am J Psychiatry 2001; 158(9):1467-73.
13. Ginzburg K, Solomon Z, Koifman B et al. Trajectories of post-traumatic stress disorder following myocardial infarction: a prospective study. J Clin Psychiatry 2003; 64(10):1217-23.
14. Zatzick DF, Russo JE, Katon W. Somatic, post-traumatic stress and depressive symptoms among injured patients treated in trauma surgery. Psychosomatics 2003; (6):479-84
15. Freedman SA, Peri T, Brandes D et al. Predictors of chronic PTSD - a prospective study. Br J Psychiatry 1999: 174: 353-9.
16. Blanchard EB, Hickling EJ, FornerisCA. et al. Prediction of remission of acute post-traumatic stress disorder in motor vehicle accidents victims. J Trauma Stress 1997; 10:215-34.
17. Resnick HS, Yehuda R, Pitman RK, Foy DW. Effect of previous trauma on acute plasma cortisol level following rape. Am J Psychiatry. 1995; 152:1675-1677.
18. Kempermann G, Kronenberg G. Depressed new neurons?- Adult hippocampal neurogenesis and cellular plasticity of major depression. Biol Psychiatry 2003; 54: 499-503.
19. Jacobs BL, Praag HA, Gage FG. Adult brain neurogenesis and psychiatry. A novel theory of depression. Mol Psychiatry Neurosci 2000; 22: 327-31.
20. Rauch SL, Shin LM. Functional neuroimaging studies in posttraumatic stress disorder. Ann N Y Acad Sci. 1997;821:83-98.
21. A research agenda for DSM-V. Ed. Kupfer I, First MB. Regier DA. 1st ed. American Psychiatric Association, 2002.
22. McEwen BS, Magarinos AM. Stress effects on morphology and function of the hippocampus. Ann NY Acad Sci. 1997;821:271-284.
23. Bremner JD, Randall P, Vermetten E, et al. Magnetic resonance imaging-based measurement of hippocampal volume in posttraumatic stress disorder related to childhood physical and sexual abuse -- a preliminary report. Biol Psychiatry. 1997;41:23-32.

24. Bonne O, Brandes D, Gilboa A, et al. Longitudinal MRI study of hippocampal volume in trauma survivors with PTSD. Am J Psychiatry. 2001;158:1248-1251.
25. De Bellis MD, Hall J, Boring AM, Frustaci K, Moritz G. A pilot longitudinal study of hippocampal volumes in pediatric maltreatment-related posttraumatic stress disorder. Biol Psychiatry. 2001;50:305-309.
26. Pitman RK, Shin LM, Rauch SL. Investigating the pathogenesis of posttraumatic stress disorder with neuroimaging. J Clin Psychiatry. 2001;62(suppl 17):47-54.
27. Rauch SL, Whalen PJ, Shin LM, et al. Exaggerated amygdala response to masked facial stimulation in posttraumatic stress disorder: a functional MRI study. Biol Psychiatry. 2000;47:769-776.
28. Van Etten ML, Taylor S.Comparative efficacy of treatments for post-traumatic stress disorder: a meta analysis. Clin Psychol Psychother 1998; 5:126-45.
29. Marshall RD, Schneier FR, Fallon Baet al. An open trial of paroxetine in patients with non-combat related chronic post-traumatic stress disorder. J Clin Psychopharmacol1998; 18:10-18
30. Tucker P, Zaninelli R, Yehuda R, Ruggiero L, Dillingham K, Pitts CD. Paroxetine in the treatment of chronic posttraumatic stress disorder: results of a placebo-controlled, flexible-dosage trial. J Clin Psychiatry. 2001;62:860-868.
31. Brady K, Pearlstein T, Asnis GM, et al. Efficacy and safety of sertraline treatment of posttraumatic stress disorder: a randomized controlled trial. JAMA. 2000;283:1837-1844.
32. Londborg PD, Hegel MT, Goldstein S, et al. Sertraline treatment of posttraumatic stress disorder: results of 24 weeks of open-label continuation treatment. J Clin Psychiatry. 2001;62:325-331.
33. Schwartz AC, Rothbaum BO. Review of sertraline in post-traumatic stress disorder. Expert Opin Pharmacother. 2002; 3(10):1489-99
34. Shilon R, Nutt D, Weizman A. Atlas of psychiatric psychopharmacotherapy.Martin Dunitz, 2000.
35. Grinage BD. Diagnosis and management of post-traumatic stress disorder. Am Fam Physician 2003;68(12):2401-8.
36. Taylor FB. Tiagabine for posttraumatic stress disorder: a case series of 7 women. J Clin Psychiatry. 2003 Dec;64(12):1421-5.

SUICIDE AND AGGRESSION. OPPOSED OR INTERCONNECTED?

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INTRODUCTION

For ages suicide and violence have been considered as the most opposite phenomena.

On the one side, the violence, the aggression, the murder were regarded as concepts connected with the power, an attack, a victory. On the other side, a suicide was always seen as a weakness, a withdrawal, a defeat. Violence and aggression were always associated with a seizure and taking over what belonged to other. A suicide was seen as a deprivation, as a refusal of the last thing a person has - its life.

As quite different were seen also a violent person and a suicide. The first one is imaged as a strong, assertive, authoritative, sadistic and cruel personality. The second is seen rather as a weak, submissive, masochistic person, a victim of a cruelty.

Both phenomena were involved in quite different social discourses. A violence was usual seen as a criminal matter. It had to be regarded in terms of law, its violation, of the guilt and punishment. The suicide was regarded much more in terms of the medicine, especially psychiatry. A murder, a rapist, a person which with intend commits harm to another person were always seen as a target for punishment, as person who has to suffer, and this way to redeem their fault. Contrary to this, a suicide tended to be seen as a person needing help, support and sympathy. Violent people had to be in prison, suicide - rather in hospital. First ones had to be guarded, second ones- protected.

Even their place on the social map was supposed to be very different. For example, Henry and Short (1954) insisted that homicide was a lower class phenomena. It is a response of this class to its social-economic situation. In contraposition to this, the suicide was seen as much more characteristic for the upper class. Its meaning supposed to be a self-punishment for inability to meet high requirements, which this class sets to its members.

This idea was supported by later researches, which revealed a close connection between suicide and a lost of social position within this class.

Especially characteristic were social and demographic data showing a ration between numbers of murders and suicides in a country. There are countries, which have a clear prevalence of suicide rate over murder. Such a country is Lithuania. Long time the rate of suicides is 4-5 time higher than the rate of murders. It seems that for people in this country it is several times easier to kill themselves that somebody else. The level of a "moral civilization", of acceptation of cultural prohibition to act against other people seems to be higher in these countries. Contrary to this, some other countries (so, USA or Russia) have equal rates of both or even a prevalence of murders. People in these country are much more ready to kill also other people.

Again, ratio of murders and suicide can be seen contrasting: their interrelation seems to be "either-or", a mutual exclusion.

This conviction, which seemed to be unshakable, has been weakening through several last decades.

The most important role in this played sociologic statistic data. They showed that contrasting to a common view these two phenomena are interconnected.

Most obvious is their social connections. It was shown that just the same people which tends to be violent have a greater inclination to be suicides and (vice versa) suicides more often have a history of violent behavior.

In a comprehensive study ol 9,365 patients admitted to public hospitals in New York Tardiff and Sweillam (1980a) found that 15.1% of male patients who displayed assaullive behavior also had a history of suicidal behavior, compared with only 8.7% of male patients without assaultive behavior. Among females, 18.4% of assaultive patients had a history of suicidal behavior, compared with 15.2% of those without as-

saultive behavior. The same scientsts (1980b) examined factors related to the risk of assaullive behavior in suicidal patients. They found that 14% of the suicidal males and 7% of the suicidal females admitted to psychiatric hospitals during the study period were assaultive just prior to admission. Interestingly, there was no difference between assaultive and non-assaultive suicidal patients in regard to frequency of depressive symptoms. However, for both sexes, assaultive suicidal patients were more likely to have delusions, hallucinations, feelings of suspicion or persecution, as well as anger, agitation and antisocial behavior. Similar trends were discovered in the research of Plutchik and colleagues (1986). They reported that in a sample of psychiatric inatients, 40% reported a history of suicidal behaviour, 42% had a history of violent behaviour, and 23% of the total sample reported a history of violent behaviours. In an emergency room setting, Skodol and Karasu (1978) reported that 17% of all patients over a 2-week period had suicidal tendencies without "other-directed aggression", and 17% were outwardly violent. Of those who were violent almost 30% displayed suicidal tendencies in addition to their violent behaviour.

These and similar date posed the question on similarities between suicide and violent behavior, interconnection between them, and,last but not least, the common origin of both.

SUICIDE AND VIOLENCE AS REACTION TO A DIFFICULT LIFE SITUATION

A difficult life situation was always seen as the most crucial reason of suicide. A person meets problems and is not able to solve them. His reaction is a frustration and a withdrawal. He can see only one way to get off . This way is to escape from life. In this situation frustration is the key to understand a suicide. A chain *"difficult life situation" - "one's inability to solve it"- "frustration" "suicide as the only escape"* is a classical "suicide chain". It was a chain explaining the prevalent majority of suicides. However, the "frustration chain" seemed to be totally unsuited explanation for violent behavior.

Deeper psychological investigation of aggression carried out within last 30 years, showed that it is not true. Frustration is also the keyword for aggression. Experiments carried out by Berkowitz, and al. demon-

strated that aggression is one of the most usual human reactions on frustration (Berkowitz, L,1969).

Aggression and its most important consequence - violence are seen in terms of his theory this way.

A frustrating situation tends to cause and enlarge one's level of frustration (disappointment). A difficult life situation being out of one's control causes a broad array of psychological reactions: an impotence, perplexity, a threat to one's self-confidence. All these reactions are an answer to one's inability to deal with a difficult situation. One cannot fancy themselves living in poverty but has no idea how to avoid it. One has no idea how to live without her/his lover but does not see how to hold her him. The longer one is unable to find any solution, the less is the hope that it can be found. The less is the hope to find a solution the greater is the probability that one will suffer defeat. This means a steady increasing danger to one's life important values. Fear joins despair and impotence. All these feelings tend to grow with time. In this sense, difficult situation tends to become a situation of accumulating and growing frustration.

Functions of frustration in such a situation are very important. First of all, it exerts an increasing pressure on one. Like increasing pressure of steam it urges an individual to get out of this situation as soon as possible.

Metaphorically speaking, one becomes "unbalanced". "Unbalanced" means a special kind of unpredictable behavior when one is under great pressure to take any actions but has no real basis to choice between different actions. An individual is *not* unbalanced when being under pressure but having a reliable choice criteria. However, if situation is unbearable but all ways to deal with it are equally bad, then every reaction can be expected.

This means that a difficult, frustrating life situation causes increase in all possible (even opposite) reactions. It can be an impulse to "destroy" this unsolvable situation, to "annihilate" it. Most important part of such a situation can be people involved in it. Thus, a person in desperation can feel a strong impulse to destroy them. But just the same situation and the same feeling can provoke an opposite reaction to run of situation using the only possible way- to run from life.

Dealing with an unbalanced person it is especially difficult to answer the question -why just this and not other reaction were selected.

The answer to this question cannot be done in terms of a difficult life situation, one's psychological state, main personality traits. It is true-all these important points can explain why one committed a suicide, or why he committed a murder. However they cannot answer the question, why one committed just suicide(and not a murder). Or, if a murder is committed, all these points are unable to explain, why an individual did not selected a suicide instead. This selection can depend on most slight nuances of situation, of one's feeling or thoughts.

The greater is frustration and its pressure the more probable are any reaction and the less possible becomes to forecast, which one will act. So, both suicide and agression can be expeded.

A lot of good illustrations for this effect of a difficult life situation provide investigations of suicide and violence in prison.

An imprisonment is a situation, in which one is deprived everything he had before: freedom, commitment and respect of other people, usual food and leisure, usual communication and sex. One is exposed to high-handedness of criminal authorities. In fact, he has nothing of all he needed in life. A great frustration is just a usual consequence and normal reaction to these situations.

Prison researches reveal a strong interconnection between suicides and violent behavior. In many countries suicide is the leading cause of death both in jails and in prison.

A great democratic and reach country US have jails with a suicide rate approximately nine times greater than that of the general US population (Hayes and Kajdan, 1981, Hayes and Danto, 1988). Moreover, the number of actual suicides US jails is probably greatly understated (Hayes and Kajdan, 1981),

As far there exist two national studies in the USA on this topic. One of them is conducted by the National Center for Institutions and Alternatives (NCI A), reported that most of those who commit suicide in police lock-ups and jails are single (52-54%), white (67-72%) males (94-96%), aged 18-27 years (43-54%), who commit suicide by hanging (94-97%)), while in isolation (67-68%) within the first 24 hours of incarceration (51-52%,), many (27-29%) within the first 3 hours (Hayes and Kajdan, 1981; Hayes and Rowan, 1988). Those who commit suicide within the first 24 hours of confinement tend to be charged with minor, non-violent, alcohol and/or drug-related offences (Danto, 1989: Hayes and Kajdan, 1981: Hayes and Rowan, 1988). Many of these victims

were acutely intoxicated and may have had disinhibitcd behavior, impaired dec is ion-making abilities, or increased emotional lability.

Suicide is also the leading cause of death *im prisons* (Hayes, 1983; Joukamaa, 1997), Research date show the rate that is several times higher than demographically similar general population rates (Joukamaa, 1997). Most longer-term jail inmates and prisoners who commit suicide have been charged with violent crimes against others, not minor drug or alcohol offences (Marcus and Alcabes, 1993; Frost and Hazlick, 1988). In a study of 44 jail and prison suicides and 198 attempted suicides in the Netherlands during 1973-1984, Kerkhof and Bernasco (1990) found that 40% of all suicide victims and 18% of suicide attempters had been charged with murder/manslaughter, compared with only 7% and 4% of controls, respectively. Length of sentence may have been a confounding variable, since 61% of all suicides and 37% of attempts had been given a sentence of 1 year or more (compared with 12% and 12% of controls). Nevertheless, being charged with murder/manslaughter seems to be an important risk factor for suicide.

A great role of a difficult life situation causing suicide is supported by investigations outside the prison. They show that both violence and suicide are closely connected with a set of social and economic factors, which mean the same - a trouble.

Many factors which produce criminality also cause suicides.

Suicide and violence are both multidetermined acts that are influenced by environmental factors, psychiatric diagnosis and biological predispositions. Some environmental factors have been shown to underlie both behaviors, including the early loss of one's parents, violence in the home (Botsis et al, 1995), a deviant family environment (Plutchik, 1995), unemployment (Platt, 1984), overcrowding, the accessibility of lethal means, and the availability of alcohol and other drugs (Fagan, 1993).

Let us consider again a situation in which one suffers a frustration. What decides the direction of his reaction: will it be a suicide or murder, aggression against himself or somebody else?

There were a lot of attempts to amplify personal traits responsible for this choice. The most known is a S.Rosenzweig typology, explicating nine typical reactions to frustration. Three of them were aggression: one aggression against oneself, another —against other people taking part in situation, the third one - reaction with indefinite direction. A per-

son steady showing second type reactions was supposed also in real life frustrating situation to react violently and to direct his aggression against other people.

There were also many other attempts to develop a tool able to forecast violent reaction of an individual in a frustrating situation.

Now it can be said that all these attempts brought more disappointment than success. A violent reaction turned to be very difficult to predict (Melton K.,1987).

Clinical analysis of individual homicides and suicides cases show that the real effect of personality states and traits able to provoke both suicide and homicide meets very complex situational determinants. They determine what kind of reaction, in which direction will be caused by the same psychological state or person state.

A brilliant illustration to this can be the famous London suicide epidemic happened in this city 1933[1] [Oxford criminology, 1999]. During this epidemic, most suicides were committed switching a gas in one's kitchen. It was quick and painless death. Suicide just used to close door of their kitchen and turn on gas. This problem caused many discussion and quite different proposal how to stop the suicide epidemic were proposed.

Most sceptically was met the proposal to stir up into gas a very stinking substance, for example, having a strong smell of garlic. It seemed obvious that this measure cannot have any effect. If a person decided to kill himself and cannot do it using gas, he will kill themselves hanging up, or jumping from a high building.

However, just this most criticized measure proved to be the most effective one. The stinking gas caused the suicide level to decrease at least twice. The smell of garlic became usual smell of gas, which originally had not any special smell.

The lecture taught by this epidemic is a huge role of situation stimulating and especially directing human behavior, especially if one is stressed, unbalanced, feels an unbearable frustration. The strength of affection (desperation, depression, etc.), amplitude of their swings can be very great. One moment the resolution to commit a suicide can be on its top. If just this moment the situation provides him an opportunity to

[1] The Oxford handbook of Criminology. Second Edition. / Ed. by Mike Maguire, Rod Morgan &Robert Reiner, Oxford: Clarendoln Press, 1997.

commit a suicide, one will use it. If this opportunity is removed (one cannot use a gas) then the next one he will have later, maybe, in several minutes. Several minutes is quite enough for his affections to swing down and become insufficient to commit suicide.

Clinical experience says that even person who seemed to take a firm decision to commit suicide most probable is highly unbalanced. One can stand for hours on the ledge of a house without jumping down but also without leaving the place. Long preparation to suicide, followed by writing of 'last letters', multiple hints to surrounding people, suicidal "death games" (one puts into his revolver only several cartridges) - all these are different shapes of unstable balance of a suicide. This unbalanced state of a suicide is highly important to understand his behavior.

UNSTABLE BALANCE. A MURDER FOLLOWED BY A SUICIDE

The motivation of a suicide is usually seen in terms of a hesitation between "commit or not commit" a suicide. As told above, even very slight accidental factor can be decisive destroying this balance, pushing it in one or another direction.

Another side of this balance - "violence against oneself or another person" still is in shadow and does not attract so many attention. However, in fact, this side of personal instability caused by frustration is also important. Fluctuations between two points "die" or "not to die" is supplemented by swinging between two others "to kill him" or "to kill myself".

A great role of slight, fortuitous factors makes it extremely difficult to investigate this fluctuation, to scrutinize factors, which were decisive in a given case .

A murder followed by suicide provides an opportunity to see this phenomena in greater details. It is an event, when one person murders another one and then commits a suicide. Most characteristic for this event is "an acute outburst of unrestrained violence associated with homicidal attacks" (Cooper, 1934; Nock, Marzuk, 1999, 444).

The phenomenon is widely spread around the world. It can be met in quite different cultures: *amok* in Malaysia, *wehtiko psychosis* among Cree *Indians, jumping Frenchman* in Canada, and *imu* in Japan(Cooper, 1934; Nock, Marzuk, 1999, 444). Coid (1983) made an extensive inter-

national overview of this phenomenon. He reviewed 17 studies from 10 nations.

Most countries record annual statistics for homicide and suicide separately, however, no one to our knowledge have a national surveillance system for tracking murder-suicides. Thus, the annual number of these events is difficult to determine. In a review of 17 studies from 10 nations, Coid (1983) concluded that murder-suicide occurred at a remarkably constant rate, averaging 0.20-0,30 per 100,000, although the countries showed marked variation in their overall simple homicide and simple suicide rates (Coid, 1983). Thus, murder-suicide as a percentage of all homicides and suicides differs markedly among countries.

For example, Philadelphia, Pennsylvania, USA, had an extremely high homicide rate during 1948-1952 and Denmark had a remarkably low homicide rate during 1955-1960: however, both had identical murder-suicide rates (0.21 and 0.22 per 100,000, respectively). During this period, only 3,6% of all murderers in Philadelphia subsequently committed suicide, whereas 42 % of those in Denmark who committed murder later committed suicide (Wolfgang, 1958: West, 1967). According to this rate, it is likely that roughly 1,5% of all suicides and 5% of all homicides in the USA occur in the context of murder-suicide.

In a review of studies of murder-suicide in the USA, Marzuk and colleagues (1992) reported that the average age of perpetrators was 39.6 years: that 93-97% of perpetrators were male: 50-86% were white: and over 85% of all victims were female. Furthermore, perpetrators and victims were usually of the same race, and almost 90% of all murder-suicide incidents involved only one victim. They also found that principal method of both homicide and suicide was firearms, which were used in 80-94% of all cases. The demographic characteristics of perpetrators and victims are different. For example, in USA parent-child murder-suicides account for only 6-16% of all murder-suicide incidents (Palmer and Humphrey, 1980; Alien, 1983), whereas they account for 40% of murder- suicides in Sweden (Lindqvist, 1986).

Although demographics differ across nations, most murder-suicides involve family members.

Murder-suicide between spouses or lovers represents one-half to three-quarters of all murder-suicides in USA (Dorpat, 1966: Palmer and Humphrey, 1980; Alien, 1983). Marzuk and colleagues (1992) termed this the spousal-amorous jealousy type, Most frequently it is the result

of a chaotic, abusive relationship marked by amorous jealousy, which is also referred to in the literature as psychotic or morbid jealousy (Shepherd, 1961; Selkin 1976). The suspected infidelity may be real or imagined and thus ranges from ruminative or obsessional to psychotic (Nock and Marzuk, 1999). The murder-suicide typically occurs after a prolonged, bitter conflict, marked by verbal abuse and sub lethal violence (Dorpal, 1966; Alien, 1983). The event is often precipitated by the victim's attempt to separate from her spouse or lover

An old parable about two hedgehogs will serve a model to analyze a murder followed by suicide. The parable tells about two hedgehogs which fall in a passionate love with one other. Being in love they wanted to nestle to each other as strong as possible. However, the stronger they tried to do it the deeper their needles dig in into each other. The more love they felt the more suffer caused it to each other.

This wise story explicates the most important features of relationships between a murder - suicide and his victim.:

1. A very close emotional connection between a murder-suicide and his victim. Most often one can see a long history of passionate affection. Emotional side of their interrelation is overwhelming. They are lovers, friends. They can be even enemies, however the history of their hostility shows: every of them needs such an enemy.

2. There exist "needles" - a problem, which hurts them. This problem (also like a needle) hurts both of them the more the closer they come to each other. A most common "needle"-problem is a fidelity. The more love the more dependence. The more dependence the more fear causes an idea that he or she can run out of him. The more fear the more mistrust. The more mistrust the more feat.

3. The situation causes an extremely opposite feelings to each other. "Love-hate" is the most apt name of their interrelation. The hate intensifies the love. The love intensifies the hate

4. Extreme fluctuations in mutual relations: an intensive conflict, an outburst of hatred, of intensive desire to destroy each other gives way to scenes of a passionate love, and only to be again replaced by hatred and a fierce conflict. An amplitude of these swings can be so wide that all behavior control both in love and hatred are lost.

All this determines the most common dynamic of a murder-suicide event. On the top of a hatred and conflict one kills another and when the hatred person is killed the hatred goes down. Then the opposite feeling,

which as far was suppressed by hatred manifest the whole its strength. An unconstrained hatred gives way to unconstrained love and despair, A murder and suicide happens on opposite sides of the emotional swing. The murder is committed on the one top of hatred, the suicide on the top of love and regret.

A dynamic of conflicting feelings is also typical for murder-suicide in which an enemy is involved. A passionate hatred like a passionate love can push one to extreme acts. An intensive hatred happens as often as an intensive love. What is different - much more effort are put to hide a great hatred a than a great love. Moral norm, a self-respect, a fear of public opinion, of destructive consequences of hatred - all these feelings are mighty constraining force, able to check hatred. When a hatred nevertheless gets through and kills the victim these opposite feeling with all their strength turns against an individual. All their strength, which used to be directed against hatred now turns against a person himself.

SUICIDE AND VIOLENCE - TWO SIDES OF AN ABNORMAL PSYCHIC STATE

It is true that just a situation plays prevalent role causing extreme frustration, which can cause both suicide and violence. It is also true, that even the slightest nuances of situation can determine a direction of this reaction - aggression against himself or another one.

However, there are also important cases in which just a person, its abnormality plays the most important role causing both violence and suicide.

A psychic disturbance destroys complicated systems which produce both aggression and its control. Many psychiatric states are followed by outburst of uncontrolled aggression. The latter, in line, is followed by hatred against other people, a strong wish to punish and hurt them. Such a state can make one dangerous both for himself and for other people. Some of these states also manifest a deep depression followed by self-accusations, despair, and a wish to punish themselves. A wish to kill themselves can be the consequence of such a state.

This again causes a person which is equally able to kill themselves or to kill somebody else.

Sociological researches show that such a "common origin" connection between aggression and suicide can be met often enough.

It is well known that 90-95% of those who commit suicide have a diagnosable psychiatric illness at the time of their death (Robins et al, 1959; Barradough et al, 1974; Rich ct al. 1986). In recent years, a number of studies have also offered convincing evidence linking psychiatric illness and violent behavior (Swanson et al, 1990; Hodgins et al. 1996). It is possible that suicide and violence are often observed in the same individual because there are shared features of an underlying psychiatric illness.

The psychiatric symptoms most often associated with increased suicidal behavior are mood disorders, alcohol and substance abuse, schizophrenia and personality disorders - particularly antisocial personality disorder and borderline personality disorder. The same diagnoses have been linked to violent behaviour. The psychiatric illness most commonly observed in those whos exhibited violent behaviour is alcohol and substance abuse (Hodgins et al, 1996: Steadman et al, 1998). Steadman et al (1998) reported that alcohol and drug abuse significantly raised prevalence of violence in both patient and community samples. Another study found that risks of suicide and violence were significantly and positively correlated in a sample of alcoholic inpatients demonstrating an overlap of the two behaviours in such a population (Greenwald et al. 1994). Psychotic disorders such as schizophrenia have also been associated with increased risk of violence (Swanson et al, 1990;). One study (Link et al, 1992) reported that the difference in rates of violence between population with mental illness and never-treated community residents is largely explained by the level of psychotic symptoms present, not by the label of "mental patient". Personality disorders particularly antisocial and borderline personality disorders, are also commonly diagnosed in those who are violent (Volavka, 1995).

In fact, anger, aggressiveness and impulsiveness are among the criteria used for diagnosing such disorders (DSM-IV; American Psychiatric Association, 1994). Mood disorders have also been reported in violent individuals (Rosenbaum and Bennet, 1986; Malmquist, 1995). The Epidemiological Catchment Area survey reported that the prevalence of mood disorders was approximately three times higher among the violent respondents than the non-violent respondents (Swanson et al. 1990).

The "common thread" underlying violence and suicide in all of the aforementioned disorders appears to be symptoms of increased impulsiveness, affective lability, disinhibition, and problems witli reasoning

and decision-making. These symptoms could lead to an overall increase in aggressiveness, which is common in both suicidal and violent behaviour. It is probably this increased aggressiveness, rather than the diagnostic label itself, that is important in the prediction of suicide and violence (Marzuk, in press).

Violent and suicidal behaviour may also be linked through an underlying biological or genetic predisposition. The most impressive finding in this area is the association between low cerebrospinal fluid (CSF) levels of the neurotransmittcr serotonin and impulsive, aggressive behaviour. Asberg and colleagues (1976), the first to report this link, found low CSF levels of the serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA) in depressed suicide attempters, compared with depressed non-altempters and normal controls. It was later shown that CSF 5-HIAA was lower in impulsive suicide attempters than in suicide attempters who had planned the act (Traskman et al, 1981). This negative correlation between serotonin levels and violent behaviour led investigators to discover that low CSF 5-HIAA levels are also present in those who commited earlier impulsive, aggressive acts, such as arson (Virkkunen et al, 1987), unpremeditated homicide (Linnoila et al, 1983), murder-suicide (Lidberg et al, 1992), cruelty towards animals (Kruesi, 1989) and aggressive behaviour in children (Kruesi etal,1992).

CONCLUSION

An inner life of a human being sometimes can be compared with a broad stream. This stream consists of billions of drops- single thoughts, feelings, emotions, perceptions, associations, ideas, conclusions and etc. This stream starts with the birth and flows till his death. In everybody's stream of conscious we can find everything. Even a most greedy person at least one time in her life experience a great wish to be wastefull. At least once during his life even a most pedantic one can feel hatred to order and a wish to be free of restrictions. Even a most honest person can cheat or at least feel the intensive wish to cheat. Even a most peaceful and loving person at least one time in her life feels a strong hatred connected with intensive wish to destroy the hatred person. Even a most self-assured individual at least one time in his life meets a difficult situation which seems to be quite impossible to bear, and seriously thought about suicide as the only exit of it.

It means that everybody has in his soul both germs of a murder and a suicide. An illness or a difficult life situation only intensify these germs bringing them to a level when a thought becomes a dead. The negative consequence of this is that nobody is an exception, nobody can be sure that suicide and violence is a story about other people, not him.

However, a positive conclusion is that just because of this we are able to understand each other. An intensive hatred, which we may feel only once a life, can helps to understand people, who hated all their life A despair, we felt once a life, help us to understand a despair of depressive person, to see with his eyes his insufferable situation, in which a death seems to be a salvation.

This understanding gives us a compass saying what one feels, how great is the danger, how heavy is for him his burden. This understanding will help us to ask such a person a right question, to recognize the true meaning of his words and deeds, to find ourselves aside him exactly in the time when he especially needs our support. Just this understanding can help to do the best use of modern psychological, medical, sociological knowledge on suicide and violence.

REFERENCES

1. Alien, N.H. (1983) Homicide followed by suicide: Los Angeles,1970-1979 *Suicide and Life-Threatening Behavior,* 13: 155-165
2. Asberg, M., Traskman, L., Thoren, P. (1976) 5-H1AA in the cerebrospinal fluid. A biochemical suicide predictor? *Archives of General Psychiatry.* 33: I 193-1197.
3. Barradough, B., Bunch, J., Nelson, B. and Sainsburv, P. (1974) A hundred cases of suicide: clinical aspects. British Journal ol Psychiatry, 125: 355-373.
4. Berkowitz, L (1969b), The frustration-aggression hypothesis revisited. In L. Berkowitz (Ed.), *Roofs of aggression: A re-examination of the frustration-aggression hypothesis.* New York: Atherton Press,
5. Berman, A. (1979) Dyadic death: murder-suicide. *Suicide and Life-threatening Behavior,* 9: 15-23.
6. Botsis, A. I., Plutchik, R., Kotter, M. and van Praag, H. M. (1995) Parental loss and family violence as correlates of suicide and violence. *Suicide and Life-threatening Behavior,* 25:253-260.

7. Browne, W.I. and Palmer, A. J. (1975) A preliminary study of schizophrenic women who murdered their children. *Hospital and Community Psychiatry,* 26: 71-75.
8. Coid, J. (1983) The epidemiology of abnormal homicide and murder followed by suicide. *Psychological Medicine,* 13:855-860.
9. Cooper, J. M. (1934) Mental disease situations in certain cultures: a new field for research. *Journal of Abnormal Social Psychology, 29:* 10-17.
10. Danto, B. L. (1989) The role of the forensic psychiatrist in jail and prison suicide. In R Rosner and R.B. Harmon (Eds), Correctional Psychiatry. New York: Plenum.
11. Dooley, E. (1990) Prison suicide in England and Wales, 1972-87 *British Journal of Psychiatry,* 156:40-45.
12. Dorpat, T. L. (1966) Suicide in murderers. Psychiatry Digest, 27; 51 -55.
13. Pagan, J. (1993) Interactions among drugs, alcohol, and violence. *Health Affairs.* 12: 65-79.
14. Frost, R. and Hanzlick, R. (1988) Death in custody, Atlanta Jail and Fulton County Jail, 1974-1985. *American Journal of Forensic Medicine and Pathology,* 9: 207-211.
15. Greenwald, D. E., Reznikoff, M. and Plutchik, R. (1994) Suicide risk and violence risk in alcoholics. *Journal of Nervous and Menial Disorders,* 182: 3-8.
16. Hayes, L. M. and Kajdan, B. (1981) And Darkness Closes. In: A National Study of Jail Suicides. Washington. DC: National Center on Institutions and Alternatives.
17. Hayes, L. M. (1983) And darkness closes in... a national study of jail suicides. *Criminal Justice and Behaviour,* 10:461-484.
18. Hayes, L. M. (1997) From chaos to calm: one jail system's struggle with suicide prevention. Behavioral Sciences and the Law. 15:399 - 413.
19. Hayes, L. M. and Danto, J. R. (1988) National Study of Jail Suicides: Seven Years Later. Alexandria, VA: National Center on Institutions and Alternatives.
20. Hodgins, S., Mednick, S. A, Brennan, P. A. Schulsmger. F. and Engberg, M. (1996) Menial disorder and crime: evidence from a Danish birth cohort. *Archives of General Psychiatry.* 53; 489-496.

21. Hoff, H. (1973) Prevention of suicide among prisoners. In B. Danto (Ed.), Jailhouse Blues. Orchard Lake, MI; Epic.
22. Joukamaa, M. (1997) Prison suicide in Finland. 1969-1992. *Forensic Science International,* 1997: 167-174.
23. Kerkhof, J. F. M. and Bernasco, W. (1990) Suicidal behavior in jails and prisons m The Netherlands: incidence, characteristics, and prevention. *Suicide and Life-Threatening Behavior,* 20:123 137.
24. Kruesi, M. J. (1989) Cruelly to animals and CSF 5-HTAA. *Psychiatry Research,* 28: 115-116.
25. Kruesi, M. J., Hibbs, E. D., Zahn, T. P., Keysor, C. S., Hamburger, S. D., Bartko, J. J. and Rapoport. J. L. (1992) A 2-year prospective follow-up study of children and adolescents with disruptive behaviour disorders. *Archives of General Psychiatry.* 49: 429-435.
26. Lester, D. and Danto, B. (1993) Suicide Behind Bars: Prediction and Prevention. Philadelphia. PA: Charles.
27. Lidberg, L., Winborg, I. M. and Asberg, M. (1992) Low cerebrospinal fluid levels of 5-hydroxymdoleacetic acid and murder-suicide. *Nordic Journal of Psychiatry,* 49:17-24.
28. Lindqvist, P. (1986) Criminal homicide in northern Sweden 1970-1981: alcohol intoxication, alcohol abuse, and mental disease. *International Journal of Law and Psychiatry,* 8:19-37.
29. Link, B. D., Andrews, I. T. and Cullen, F. T. (1992) The violent and illegal behavior of mental patients reconsidered. *American Sociological Review,* 57: 275-292.
30. Linnoila, M., Virkkunen, M., Scheinin, M., Nuutila, A., Rimon, R. and Goodwin, F. K. (1983) Low cerebrospinal fluid 5-hydroxyindoleacetic acid concentration differentiates impulsive from non-impulsive violent behavior. *Life Sciences.* 33: 2609-2614.
31. Malmquist, C. P. (1995) Depression and homicidal violence. *International Journal of Law and Psychiatry.* 18: 145-162.
32. Marcus, P. and Alcabes, P. (1993) Characteristics of suicides by inmates in an urban jail. *Hospital and Community Psychiatry,* 44: 256-261.
33. Marzuk, P. M. and Mann, J. J. (1988) Suicide and substance abuse. *Psychiatric Annals,* 18:639-645.
34. Marzuk, P. M., Tardiff, K. and Hirsch, C.S. (1992) The epidemiology of murder-suicide. *Journal of the American Medical Association.* 267; 3179-3183.

35. Melton K., Psychological evaluations for the courts: A Handbook for Mental Health Professionals and Lawyers, N-Y, 1987
36. Menninger, K. (1938) Man Against Himself. New York: Harvest,
37. Nock, M. K. and Marzuk, P. M. (1999) Murder-suicide: phenomenology and clinical implications. In D. G. Jacobs (Ed.), Harvard Medical School Guide to Suicide Assessment and Intervention. Cambridge. MA: Simon and Schuster.
38. Palermo, G. B. (1994) Murder-suicide—an extended suicide. *International Journal of Offender Therapy.* 38: 205-216.
39. Palmer, S. and Humphrey, J.A. (1980) Offender-victim relationships in criminal homicide followed by offender's suicide. North Carolina. 1972-1977. *Suicide and Life-Threatening Behavior,* 10: 106-118.
40. Platt, S. (1984) Unemployment and suicidal behavior: a review of the literature. *Social Science and Medicine.* 19:93-115.
41. Plulchik, R., van Praag, H. M. and Conte, H.R, (1986) Suicide and violence risk in psychiatric patients. In C. Shagass (Ed.), Biological Psychiatry. New York: Elsevier.
42. Resnick, P. J. (1969) Child murder by parents: a psychiatric review of filicide. *American Journal of Psychiatry,* 126: 325-334.
43. Rich, C.L., Young. D. and Fowler, R.C. (1986) San Diego suicide study. I: young vs. old subjects. *Archives of General Psychiatry,* 43: 577-582.
44. Robins, E., Murphy, G. E., Wilkinson, R. H., Jr, Gassner, S. and Kayes, J. (1959) Some clinical considerations in the prevention of suicide based on a study of 134 successful suicides. *American Journal of Public Health,* 49: 888-889.
45. Rodenburg, M. (1971) Child murder by depressed parents. *Canadian Psychiatric Association Journal.* 16:41-48.
46. Rosenbaum, M. and Bennet, B. (1986) Homicide and depression. *American Journal of Psychiatry.* 143:367-370.
47. Rosenbaum, M. (1990) The role of depression in couples involved in murder-suicide and homicide. *American Journal of Psychiatry,* 147: 1036-1039.
48. Sakuta, T. (1995) A study of murder followed by suicide. *Medicine and the Law,* 14: 141-153.
49. Selkin, J. (1976) Rescue fantasies in homicide-suicides. *Suicide and Life Threatening Behavior.* 6: 79-85.

50. Shepherd, M. (1961) Morbid jealousy: some clinical and social aspects of a psychiatric syndrome. *Journal of Mental Science.* 107: 687-753.
51. Skodol, A. E. and Karasu, T. B. (1978) Emergency psychiatry and the assaultive patient. *American Journal of Psychiatry.* 135: 202-205.
52. Steadman, H. J., Mulvey, F. P., Monari, M. J., Rohhins, P. C. Appelhaum, P. S.,Grisso, T. Roth, and Silver, E. (1998). Violence by people discharged from acute psychiatric inpatient facilities and others in the same neighbourhoods. *Archive of General Psychiatry,*55; 393-401.
53. Swanson, J. W., Holzer, C. E., Ganju, V. K. and Jano, R. T. (1990) Violence and psychiatric disorders in the community: evidence from the Epidemic logic Catchment Area survey. *Hospital and Community Psychiatry',* 41: 161-188.
54. Traskman, L. Asberg. M, Bertilsson, L. and Sjostrand, L. (1986) Monoamine metabolites in CSF and suicidal behaviour. *Archives of General Psychiatry,* 3S: 631-636.
55. van Praag, H. M., Plulchik, R. and Apler, A. (Fds) (1990) Violence and Suicidality: Perspectives in Clinical and Psychobiological Research. New York: Brunuer Mazel.
56. Venkoba Rao, A. (1975) Suicide in India, In N.H. Farberow (13d.), Suicide in Different
57. Virkkunen, M., Nuutila, A., Goodwin, F. K. and Linnoila, M. (1987) Cerebrospinal fluidmonoamine metabolite levels in male arsonists. *Archives of General Psychiatry.* 44:241-247.
58. Volavka, J. (1995) Neurohiologv of Violence. Washington. DC: American Psychiatric.
59. West, D. J. (1967) Murder Followed by Suicide. Cambridge. MA: Harvard University Press.
60. Wolfgang, M. F. (1958) Patterns in Criminal Homicide. Oxford: Oxford University Press.
61. Yap, P. M. (1951) Mental diseases peculiar to certain cultures: a survey of comparative psychiatry. *Journal of Mental Science*. 97: 313-327.

THE PROBLEM OF VIOLENCE AGAINST WOMEN

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The article deals with the problem of violence against women, shortly reviews manifestations of violence and its results. The issue of actuality of the problem of violence against women is discussed in a more detailed way relatively dividing it into sexual violence against women inside and outside the family.

Key words: violence, sexual violence, intimate partner violence, domestic violence, rape, trafficking

The responses of the increasing number of violence cases clarifies undoubtedly that violence in Lithuania as well as all over the world is a very sensitive and actual problem. Lithuania as well as other countries in the world constantly faces different types of violence. Almost regularly we learn not only about cases of domestic violence but also about violence outside the family. More and more often we learn about cases of violence not only against spouses or other adult family members (parents, brothers, sisters, etc.), but also against children. Though, if a stranger's violence against his victim is quite an open problem, domestic violence, or in other words, violence in the family, is quite an ulterior problem in our society. Because of this reason it becomes even more sensitive and harder to overcome.

If the problem of violence outside the family is defined quite well and is quite easy to except, cases of domestic violence, or violence in the family, are very difficult to be described. In this case it becomes quite difficult to establish where and when violence in the family begins

(especially in the cases of psychological violence). Behavior which in one family is considered already an act of violence, in another family is more or less a usual way of communication. The statistics on violence cases is usually gathered from the police, social services or hospitals, though these figures usually do not fully reveal the real situation, as almost only cases of physical or sexual violence are usually fixed by these institutions (besides, evidence of these types of crimes is quite obvious), but other types of violence, such as emotional, economic violence, neglect, etc. usually are not fixed at all or just remain in the notes of psychologists or psychotherapists. It is quite typical that some cases of violence become evident only when a particular victim of a violator is admitted to hospital and simultaneously gets into the public eye. Alas, the inadequacy in legislation allows to thrive multifold different types of violence, because even in particular cases of violence, legal institutions are not able to provide all the victims even temporary help, such as to place victims into crises centers, to evict violator, etc. not mentioning other further help provided to the victims of violence It is certainly the state's sensitive issue.

Alas, not all the cases of violence reach legal institutions and the public eye. Violators often escape punishment because of their victims[1] fear, shame, seeming or real possibility to be denounced by the society, nearest relatives and friends, etc. In the cases of domestic violence, victims often try to cover violator because of loyalty to the family or not wishing to ruin his reputation, and at the same time they try to keep maybe the only source of sustenance. So the economic dependence, alongside with other reasons, also becomes a relevant reason for not informing about the violator's behavior. At the same time, all these motives of the victim often become "green light" for the further unrestricted violence to the violator. Nowadays more and more often attention is given to the most frequent victims of violence -women. For this reason the article deals with peculiarities of violence against women and types of evidence. The article also discusses the issue which is rarely discussed in public, i. e. sexual abuse of women both inside and outside the family.

Research on sexual violence cases against women has for a long time been the sphere of interest of legal institutions, different kinds of scientists and mass media representatives all over the world. Alas, hi Lithuania most of the attention is given to the cases of sexual violence

outside the family, very often leaving the problem of domestic sexual violence to solve to the family itself. Legal institutions quite poorly prosecute the analysis of particular cases of sexual violence, explaining it by the inadequacy of legislations, lack of resources and instruments. Lithuania is still short of proper legal and other means for solving this urgent and sore issue.

For this reason the article basis its statements mainly on the research material of foreign scientists, especially taking into consideration the U.S. statistics that provides much useful and full information on the point under discussion.

Notion of Violence. In order to describe the peculiarities of violence against women one has to describe the notion of 'Violence" itself and analyze the ways of its manifestation. As it was mentioned above, the most evident victims of violence are those having experienced physical violence, but alongside with physical violence other, no less sensitive types of violence exist. Different authors with major and minor variations describe the notion of violence. For this reason when generalizing definitions presented by different authors, in this article the notion **"violence" is meant to describe violent physical, psychological, sexual actions, forced economic dependence and a person's neglect.**

With reference to such a notion of violence it also includes the following types of violence: physical, psychological, sexual, economic and a person's neglect. These types of violence are further shortly discussed in the article. As other authors distinguish a more expanded range of violence, the article defines short generalized definitions of different types of violence.

Physical violence - is a set of physical actions by using which the violator may physically hurt, injure or even kill a victim.

Psychological violence - is a set of verbal actions aiming to hurt the victim's feelings, terrorize, force to realize the victim's dependence on the violator.

Sexual violence - are forced sexual actions, in which the victim participates against her will.

Economic violence - includes physical and psychological violence by using which the vioktor makes his victim dependent upon him (deprivat of money, demand to drop the job, etc.).

Neglect - not providing the necessary amount of attention to the victim, not meeting the most elementary biological and psychological demands of the victim (starving the victim, prohibition to educate, etc.).

The Women's Study Center of the University of Vilnius submits the generalized types of violence against women defined by the Canadian sociologist W.S. Dekeseredy: against unmarried women: **physical, psychological, sexual,** types of violence against women living in an unregistered marriage, married and divorced women: **physical, psychological, sexual, economic** (1).

So, after a short survey of the types of violence the article analyses in detail one type of violence against women - sexual violence, and presents its manifestation against women in the family and outside the family.

VIOLENCE AGAINST WOMEN INSIDE THE FAMILY

Violence against women inside the family can also be referred to as Domestic Violence or Intimate partner violence. Following the National Violence Against Women Survey (further -NVAWS) definition of **"Intimate partner violence"** this type of violence includes **rape, physical assault and stalking perpetrated by current and former dates, spouses, and cohabiting partners, with cohabiting meaning living together at least some time as a couple** (2).

In this article the notion family is referred to as the traditional family based on marriage and non-traditional family (or the so called "free marriage" or "cohabiting partnership"). It also refers to the heterosexual deviation of the family not including sexual minorities. In order to avoid mess in the terms in this article with reference to domestic violence the man is called a husband and the woman is called a wife in spite of the fact if the family is officially registered or it is "a free marriage".

Historically in Lithuania violence has been used, tolerated and sometimes even stimulated by the society. Especially it is applied to cases of domestic violence. A historically developed tradition when a woman is considered only a mother, giving birth to and raising her children and the one whose responsibility is to take care of the 'Tamily's fireplace" has made a woman economically dependant upon her husband. This economic dependence as if gave men a right to a physical and sexual assault against women.

The cause of such an assault was not only women's economic dependence but also inability to break off marriage. As at the end of the 19th - the beginning of the 20th century Lithuania kept to the canons of the Catholic Church in reference with the issues of marriage, it was practically impossible to break off a marriage. The family issues investigator Marcinkeviciene says that "the forced marital relations which could not be substituted by any other relations usually stimulated rude and extremely cruel behavior". In the author's opinion at that time nobody even wondered at the wife's beating in Lithuanian families. Domestic violence was considered as a normal thing, such as hard work or poverty (3). So it was quite natural that violence against the spouse was not considered the reason for breaking off a marriage. One could expect only a separation in case of a cruel behavior with a spouse. Though even here there have been restrictions because as the author says "it was possible to motivate separation only by giving evidence of violence being a threat to one's health and life". At that time in Lithuania "such evidence could be given only by witnesses but people outside the family did not intrude into the family's relations, because fighting in disharmonious families was a usual thing and nobody knew if it would end just in kicking or death" (3).

The image of a woman just as a supplement to the man has been created since old times and is still alive in a modern society though nowadays most women work and earn their living themselves, thus escaping economic dependence on men. Alas, such an image is still alive even among women. Though being economically independent, part of women feel psychological inferiority in comparison with men and doubt if they could independently support themselves and their children (though many divorced women deny this opinion) ir continue to suffer from their spouse's violence.

The data of the USA National Crime Victimization Survey (NVC) reveal that only in the year 1998 about 1 mln. violent crimes were committed against the present, former spouses, cohabitants, etc. These crimes characterized as the Intimate partner violence are mostly committed against women (even 85% of the mentioned 1 mln. of crimes). The data submitted by the NVC also reveal in most cases women of 16-24 years of age suffer from violence. In reference to the Intimate partner violence several risk factors enabling to foresee that a woman is likely to suffer from this particular type of violence may be distinguished

(though it does not mean that in the presence of these Intimate partner violence factors there will necessarily be manifestations of violence).

The woman is likely to suffer from different types of violence in case (2, 4):

- The couple is unmarried, cohabiting partners;
- The woman's income is lower;
- The woman's education is lower;
- The partners' education, professional status, income is different;
- One of the partner's have suffered from and/or has witnessed violence in the family;
- In the families where the power is concentrated in the man's hands and this is the man who decides on the family's financial issues and controls his spouse or cohabitant whereabouts;
- The woman has development problems;
- The woman is pregnant;
- The woman is sick or has just returned from hospital;
- The woman is trying to leave the aggressors in order to challenge the aggressor's control;
- The woman is after separation or divorce;
- The aggressor is drug or alcohol addict;
- The woman has suftered from violence in the past.

SEXUAL VIOLENCE AGAINST WOMEN

Sexual violence against women is one of the most frequent types of violence. Ad it was mentioned above, sexual violence is described as forced sexual actions, in which the victim participates against her will. Different authors distinguish different types of sexual violence: rape, attempt to rape, sexual harass, etc. This article does not deal with separate cases of sexual violence. Sexual violence in this article includes rape, attempt to rape, sexual harass. In Orsillo's opinion there a lot of ways to involve a woman into sexual intercourse against her will (5). The vioktor may use physical and psychological pressure. According to the data of the U.S. Department of Justice annually in the United States on the average 366.460 cases of sexual violence 94% of which end in a full rape, 91% end in an attempt to rape and 89% of sexual harass against women were reported (6). In Lithuania these figures are apparently

smaller but when taking into consideration the size of the country they are quite big. According to the Republic of Lithuania Ministry of Interior data during the recent five years annually on the average 188 cases of sexual violence (or on the average 0.53 cases of sexual violence for 10000 inhabitants) have been reported (7). Taking consideration that not all cases are reported to the police the real figures are likely to be bigger. By the way, the victims of sexual violence for one or another reason do not want to report about the event to the legal institutions. The data submitted by the U.S. Department of Justice also show that even 63% cases of completed rape, 74 % cases of completed and attempted sexual assaults have not been reported to the police (6). The same tendencies are observed in Lithuania. The data of the International Crime (Victim) Survey in Vilnius (Lithuania) 2000 (further - ICS) reveal that even 92% of the inquired people who have suffered from different types of sexual violence did not apply to legal institutions (8). The reasons for this are more or less alike: personal reasons, fear of revenge, a wish to protect the violator, unbelief in police, etc. It is worth mentioning that the tendency is obvious: the closer is the relationship between the violator and victim, the rarer are the cases of applying to legal institutions.

SEXUAL VIOLENCE AGAINST WOMEN INSIDE THE FAMILY

One of the most sensitive types of violence against women is the sexual violence inside the family. The topic is not widely discussed because of the society's negative reaction to such kind of victims, the opinion which has formulated long ago that a wife is almost husband's property, so the sexual intercourse (even if it is against the woman's will) is likely to be the wife's duty. For this reason even forced sexual relationship is not considered "a real" rape by the society, violator, and sometimes even by the victim herself. According to the data of NVAWS about 7% of the Intimate partner violence victims have at least once suffered from the sexual violence, and almost 0.2% of women have been raped by their spouses during the recent twelve months (2). Bergen submits a bit bigger figures: he says that from 10 to 14% of married women in the USA have suffered from sexual domestic violence. He also offers the data which reveals that of all the cases of rape marital rape constitutes 25% (4). As the same notion of marital violence is dif-

ferently distinguished by different authors, types of violence distinguished by them differ too. The article is based on the types of marital rape given by Bergen (4):

1. Force-only rape: The husband uses only the amount of force necessary to coerce their wives.
2. Battering rape: Husbands rape and batter their wives. The battering can happen concurrently or before or after the sexual assault.
3. Sadistic/obsessive rape: Husbands use torture or perverse sexual acts. Pornography is often involved.

From this classification it is obvious that it is difficult to distinguish between marital sexual assault and other types of violence, e. g. physical violence. In other words, sexual violence is not the "mere" form of violence.

By the way, it should be mentioned that violence against women inside the family is usually a repeated act. According to the data of NVAWS 51.2% of women having been raped by their Intimate partners and 65% of women having suffered from physical violence in their families maintained that the acts of violence have repeated for a year or more. Women who have suffered from their Intimate partner's sexual violence endured the situation for 3.8 years and women who have suffered from thqir partner's physical violence endured the situation for about 4.5 years. The women who have experienced a repeated sexual violence have been raped by their husbands for 20 or more times until they broke off such relationship (2). Another sensitive issue is reporting about sexual violence to legal institutions. Major part of women having experienced sexual violence were not apt to report about it, especially when the violator was their intimate partner. Following the data of the U.S. Department of Justice only 32% of sexual violence victims have reported about the event to the legal institutions (6). The mentioned Department also underlines that the research data show that the closer is the relationship between the victim and offender the rarer the event is reported to legal institutions. For instance, 77% of cases of rape, 77% of cases of attempt of rape and 75% of cases of sexual harass have not been reported to the police when the violator was a recent or former spouse or the victim's cohabitant (9).

Bergen maintains that in comparison with other victims of violence the victims of marital sexual violence are apt not to inform about the cases of violence to legal institutions, friends or family members (4).

Submission of such information can even more complicate the relations between spouses. Women raped by their husbands do not inform about the event due to their loyalty to the family, fear of the spouse's revenge, inability to break off such a relationship or they simply may not know about the fact that rape in the family is prohibited by law. When asked about the reasons of non-reporting the women told the same reasons as those mentioned above, as in most other cases of sexual rape (including those cases when women were not victims of intimate friend's rape): about 21,2 % of raped women were afraid to inform about the event because of the fear of the offender's revenge, 20.3% maintained that the rape was accidental and unimportant, 16% maintained that they were ashamed to report about the incident which they considered to be a personal affair, 13% were of the opinion that the police could not help (2, 6).

As it has already be mentioned some women believe that only "the stranger's violence" is considered "the real violence", others sexual intercourse interpret as their marital duty, so in their opinion forced sex is "the wife's obligation" not a rape. If women do not consider marital violence "a real rape", it is no wonder that they are not likely to look for help outside the family.

The economic position is among many reasons why women do not leave their husbands -violators. Financially independent women are likely to leave their spouses - offenders that those financially dependent upon their husbands. The NVC data also reveal that the number of the intimate partner violence acts is in inverse ratio to the family's income, i. e. 20 intimate friend's rape cases per 1000 women whose families' income is the lowest whereas less than 5 intimate partner's rape cases per 1000 women whose families' income is the highest. Women's fear of the offenders' rage is reasonable - 2/3 of rapes were committed at the end of the relationship.

Often the victim's family and friends do not support her resolution to leave the offender. By the way, in traditional families wives are likely to blame themselves for their husbands' marital violence and stay with their partners. In cases when violence is changed by moments of "good times", love and hope women are likely to avoid leaving violators.

SEXUAL VIOLENCE AGAINST WOMEN OUTSIDE THE FAMILY

When referring to sexual domestic violence the violator was an intimate partner, in case of violence outside the family, we can distinguish the following types of the violator: an acquaintance (but not an intimate partner) and stranger's sexual violence. According to the Michigan Judicial Institute (further - MJI) definition, sexual **violence in** case **the violator is a stranger means that before the act of violence the victim and** violator **did not know each other, while the violence of acquaintance means that the victim and violator knew each other before the act of sexual violence act** (10). Such acquaintance violators can be just people met by chance, friends, co-workers, neighbours, family doctors, therapists, spiritual leaders, business partners, letter - carriers, shop assistants, etc. That is why and the acquaintance sexual violence is often committed not exactly in "real public" places: at work, school, hospital, etc., while the stranger sexual violence is usually committed in the streets, parks, squares, and in other similar "real public" places. Sexual violence of acquaintance is more common than the stranger's sexual violence. Data of JMI reveal that more than in 70 % of sexual violence cases, the victim knew her offender (10). Research about college women carried out in the USA, victimization data show that 9 from 10 sexual offenders were known to their victims (but it has to be mentioned that these 10 offenders are considered together with Intimate partners) (11). The same research shows that most frequently the sexual violence occurs in the dates (12,8 % of rapes, 35 % of attempted rapes and 22.9 % of threat of rape), and the other research data show that from the total amount of sexual cases, 19.2 % of sexual violence cases take place in the house of friends, neighbours or relatives, whereas in the streets - 10 %, parking lots, - 7.3 %. The ICS data reveal similar tendencies: 11 % cases of sexual violence took place not far from home, 10 % -at work and even 67 % of sexuai violence acts were committed in other places of the city. The same data show that 11 % of victims knew the offender and 21 % of all the victims knew the name of the offender. Most women who suffered from the acquaintance violator, became the victims of co-workers and close friends. In many cases victims of co-workers were 25 - 29 year old (100 %) and 30-39 year old (40 %) women (8).

This article also discusses quite a new type of sexual violence in Lithuania - **trafficking** in women. More and more often the media reveals us the destiny of women who were forced to become prostitutes abroad. Trafficking in women is an international problem that needs to be discussed by different kinds of research and requires collective work in order to try to stop trafficking in women. The newest data of the International Organization for Migration show that at least 700.000 of persons, especially women and children, cross all the international borders all over the world. The IOM data show that every year approximately 500.000 women are transferred from poorer countries to more economically developed countries (12). Some sources say that these figures are much bigger. The above mentioned sources maintains that trafficking in women is "a modern form of slavery".

This problem came to Lithuania since the 1990s when Lithuania reestablished its independence. After opening its borders Lithuania became an object of great interest for trafficking organizers. At that time one of the most actual problems in our country was the economic shortage and unemployment that forced young women (often with a child and unemployed), to take any job in order to survive - sometimes even to provide sexual services (12). So the negative economical situation was the one of the most important of all those reasons that led to sell young women to the sexual slavery where they usually suffered not only from sexual but also from physical and psychological violence. In the psychotherapist Chomarova's words women who are taken to work as prostitutes experience the same mechanisms of special manipulation of victims that are used in concentration camps, some religious sects, etc., such as: violence, rape, torture, beating, starvation, etc (13). **Demographic characteristics of victims.** Following the data of the IOM Lithuania most frequently this type of sexual violence is experienced by 18-30 year old women. Their educational level is lower that the country's average level but they are not uneducated. Usually their education is that of an unfinished further education. By the way, it should be marked that these demographic data are also typical to victims of intimate partner violence: both victims of intimate partner and trafficking have a lower education (or they are unemployed), they depend to the same age group (12).

Majority of women taken abroad to work as prostitutes by trick are unmarried (84%), raised in the so-called "good families". Besides, ma-

jority of victims are inhabitants of cities (about 80%). It should be mentioned that no language requirements were applied to the victims taken abroad to work as prostitutes by trick. Thus violators are sure that victims will not apply to different institutions for help (12).

Causes. The main causes according to the IOM Lithuania for looking for work abroad are **economic.** First, a high level of unemployment in Lithuania. Second, a tendency of non-perspective (as it has been mentioned most of the victims have lower education). Third, most of women look for happiness abroad, hope to find a husband there, get married and live abroad. The patriarchal culture existing in Lithuania make the woman easily taken abroad for the purpose. As one of the reasons of domestic violence is the one that the man treats a woman just "a thing", very quickly he makes up his mind how to get profit from "the thing"(12).

By the way, the reasons of women's not leaving the slavery are almost the same as those of women who do not leave their husbands - violators. Usually they are afraid of violators' (in this case sellers') rage and revenge, also for economic reasons (they feel owing to the violator, hope to accumulate and bring back to Lithuania some money). Some of them have nowhere to go. It should be underlined that in majority of cases violators choose their victims for this purpose from a sensitive social layer - from asocial and disharmonious families, orphans, i. e. such women whom nobody from their families and relatives will seriously look for.

RESULTS OF SEXUAL VIOLENCE AGAINST WOMEN

Referring to the victims of both sexual violence inside and outside the tamily one can notice the same results of the sexual violence which can be divided into two parts: **physical** and **psychological** which can last for years. Following the data of the U.S. Department of Justice all the victims of a full rape are more or less physically injured (6). **Physical** injuries fluctuate from "light injuries", including bruising under the eyes, knock out of teeth, etc. to "hard injuries", including broken bones, shooting injuries, etc.

The investigator Sharkansky maintains that the women who have experienced sexual violence face a lot of repeated health problems in comparison with the woman who have not suffered from this kind of

violence. Such problems include diabetes, overweight, arthritis, asthma, repeated surgical interventions, chronic aches of pelvis, the syndrome of irritable gut, back and head aches, eating, reproduction and digestion disorders, high blood pressure, etc. They are likely to get venereal infections (including AIDS) (14).

The **psychological** results are no less sore. In Orsillo's words women who have experienced sexual violence may experience a variety or reactions to the incident. The author underlines that the reactions of such women may differ: some of them react at once, some women's reaction to the violence is delayed. At early stages most of women experience shock, perturbation, anxiety, and/or depression. Sometimes women experience denial, i. e. they can not fully accept what has happened to them or may underestimate the intensity of this experience. This reaction is more typical to the women having experienced the acquaintance or intimate partner's sexual rape. Majority of victims of rape fight with the anger having appeared after the incident. Though reasonable anger is quite a normal state of reaction to violence, the lasting anger can have a negative impact on the victims treatment process and her future lite. Shame and fear are also typical reactions to sexual violence. Women blame themselves for the incident or feel shame to have become the victim of sexual rape (5). Among the results of sexual violence a sudden stress disorder may appear the symptoms of which are depression and isolation as if being dizzy or dreaming or treating the world as an unreal one, a repeated experience of the incident in thoughts, recollections, nightmares, avoiding of things (places, thoughts, feelings) which could remind her of the experienced violence, anxiety, exaggerated sensitivity.

Major depressive disorder (further - MDD) is a typical reaction to sexual violence the symptoms of which are as follows: depressive mood, inability to feel joy, sleeping and eating disorders, difficulties in concentration of attention and decision making problems, the feeling of guilt, hopelessness and a decreased self-respect. Investigators maintain that about 1/3 of all victims of sexual violence at least once in their life experience the MDD. The depression may last for many years then. The victims of sexual violence are likely to think about the commitment suicide. Some studies reveal that 1/3 of women under stress because of the sexual violence had thoughts about the commitment suicide and 17% of victims have tried to commit suicide (5).

The post-traumatic stress disorder is typical to victims of sexual violence. Orshillo submits the data indicating that even 94% of women having experienced sexual violence have suffered from this syndrome within two weeks period the symptoms of which are as follows: repeated thoughts about the incident, nightmares, avoiding thoughts, feelings and situations connected with the incident and exaggerated sensitivity. Frequently sexual victims may face **social problems.** In Orshillo's opinion such women may have communication problems, marital or dating problems (5). She may also feel depressed and anxious. Majority of women maintain that after the experienced sexual violence they feel a decreased level of confidence in people. Sharkansky maintains that even a usual medical examination may remind the woman of an experienced sexual violence. Even the usual doctor's touches, different strength differentiation between the patient and doctor, taking off clothes and being naked may remind her of the incident. Also some types of medical examinations, such as endoscopy, gastroenterological, gynecological and other examinations, also instruments put into different cavities of the body may cause the manifestation and intensifying of the PTD symptoms (14). The woman may experience **sexual problems** which may remain for a long time in comparison with other problems. Women can be afraid of or avoid having sexual intercourse and their libido may be decreased. The studies also maintain that the women having experienced sexual violence may start using **alcohol or drugs.**

So it is obvious that experience of sexual violence in the family as well as out of family has a multiple impact on the victim's life: psychological, physical and social problems. It worth mentioning that the matter usually remains only the sexual victim's problem. When communicating with the family, raising the children, etc. the mentioned problems may also affect them and spoil their lives. For this reason this type of violence requires deeper scientific research, attention of media and representatives of different institutions. It is especially actual in Lithuania where the public's attention towards victims of sexual violence is still limited to the words "blame yourself.

CONCLUSIONS

1. Lithuania as well as other countries in the world constantly faces different types of violence, such as sexual, physical, psychological violence, etc.

2. The notion "violence" is meant to describe physical, psychological, sexual violence, forced economic dependence and a person's neglect.

3. Domestic violence is quite a common type of violence against women not only in Lithuania but all over the world. This type of violence is considered to be connected with different communities' prevailing opinion thet have developed in the past that a woman is man's property.

4. One of the most frequent types of violence against women is sexual violence that can be described as any kind of sexual activity between two or more persons, when one person is involved into this activity against his own will

5. Women experience sexual violence both inside and outside the family.

6. One of the most recent type of sexual violence putside the family in Lithuania is trafficking in women.

7. Alas, violators often escape punishment because of their victims[1] fear, shame, seeming or real possibility to be denounced by the society, nearest relatives and friends, etc.

8. AH the types of the above mentioned sexual violence results in sore experience, including physical, psychological, social, etc. which has a great impact not only on the victim's life but also on her family members', surrounding people's lives.

REFERENCE

1. Women's Study Center of the University of Vilnius. Problem of violence against women in recent Lithuania. Vilnius: Medicine library of Lithuania; 1997
2. Tjaden P, Thoennes N. Extent, Nature, and Consequences of Intimate Partner Violence. Findings from the NATIONAL Violence Against Women Survey; 2000

3. Marcinkeviciene D. Society of the married: Marriage and divorce in Lithuania at the end of the 19th-beginning of the 20th century. Vilnius: Vaga; 1999
4. Bergen R K. Marital Rape; 1999
5. Orsillo S. Sexual Assault against Females. Available from: URL: http://www.ncptsd.org/facts/specific/fs_female_sex_assault.html
6. U.S. Department of Justice. Rape and Sexual Assault: Reporting to Police and Medical Attention 1992 - 2000. NCJ 194530; August 2002
7. Report of Ministry of Internal Affairs. Data about registered and detected primes committed in the Republic of Lirthuania during 12 months in 2002 (form 2Z-APSK). Available from: URL: http://www.vrm.lt/
8. International Crime (Victim) Survey in Vilnius (Lithuania) 2000 - Final Report. Vilnius: Institute of Law; 2000
9. U.S. Department of Justice. Intimate Partner Violence. NCJ 178247; May 2000
10. Michigan Judicial Institute. Sexual Assault Benchbook. Available fro: URL: http://courts.michigan.gov/mji/resources/sabb.htm
11. Fisher B S, Cullen F T, Turner M G. The Sexual Victimization of College Women; 2000
12. International organization for Migration. Trafficking in Women and Prostitution in the Baltic States: Social and legal aspects. Helsinki: IOM; 2001
13. Chomarova M. The Experience of the Survivors. In: Crossing Borders against Trafficking in Women and Girls; 1999
14. Sharkansky E. PTSD Information for Women's Medical Providers. Available from: URL: http://www.ncptsd.org/facts/specific/fs_female_primary.html

TERRORISM

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Even though most people can recognize terrorism when they see it, experts have had difficulty coming up with an ironclad definition. The US State Department defines terrorism as "premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience." In another useful attempt to produce a definition, Paul Pillar, a former deputy chief of the CIA's Counterterrorist Center, argues that there are four key elements of terrorism:

1. It is premeditated—planned in advance, rather than an impulsive act of rage.
2. It is political—not criminal, like the violence that groups such as the mafia use to get money, but designed to change the existing political order.
3. It is aimed at civilians—not at military targets or combat-ready troops.
4. It is carried out by subnational groups—not by the army of a country.

Word “Terorrism” was coined during France's Reign of Terror in 1793-94. Originally, the leaders of this systematized attempt to weed out "traitors" among the revolutionary ranks praised terror as the best way to defend liberty, but as the French Revolution soured, the word soon took on grim echoes of state violence and guillotines.

Terorrism is not a new phenomenon. The oldest terrorists were holy warriors who killed civilians. For instance, in first-century Palestine, Jewish Zealots would publicly slit the throats of Romans and their

collaborators; in seventh-century India, the Thuggee cult would ritually strangle passersby as sacrifices to the Hindu deity Kali; and in the eleventh-century Middle East, the Shiite sect known as the Assassins would eat hashish before murdering civilian foes. Historians can trace recognizably modern forms of terrorism back to such late-nineteenth-century organizations as Narodnaya Volya ("People's Will"), an anti-tsarist group in Russia. One particularly successful early case of terrorism was the 1914 assassination of Austrian Archduke Franz Ferdinand by a Serb extremist, an event that helped trigger World War I. Even more familiar forms of terrorism—often custom-made for TV cameras—first appeared on July 22, 1968, when the Popular Front for the Liberation of Palestine undertook the first terrorist hijacking of a commercial airplane.

Usually terrorism is aimed at an audience. Terrorist acts are often deliberately spectacular, designed to rattle and influence a wide audience, beyond the victims of the violence itself. The point is to use the psychological impact of violence or of the threat of violence to effect political change. As the terrorism expert Brian Jenkins bluntly put it in 1974, "Terrorism is theatre."

September 11 was the deadliest terrorist attack in history. Before September 11, the deadliest attacks were the bombings of airplanes, such as Pan Am flight 103, destroyed over Lockerbie, Scotland, in 1988 by terrorists linked to Libya, or the 1985 bombing of an Air India jet. Each of these attacks killed more than 300 people. The August 1998 bombings of the U.S. embassies in Kenya and Tanzania—before September 11, the largest attacks on major buildings—killed 224 people; these attacks have been linked to al-Qaeda.

By way of comparison, Timothy McVeigh killed 168 people by bombing a federal office building in Oklahoma City in 1995. The failed February 1993 attempt by Islamist terrorists to destroy the World Trade Center killed six people and injured about 1,000 others. And the 1983 Islamist suicide bombing of the U.S. Marine barracks in Beirut, Lebanon, killed 242 Americans.

During the 1990s, there were fewer terrorist attacks, but they tended to kill more people. Experts attribute this trend—fewer attacks, more fatalities—to a rise in religiously motivated terrorism, which lacks some of the restraints of earlier versions of terrorism. They add that heightened vigilance and security has often made the hijackings and

kidnappings popularized in the 1960s and 1970s more difficult, driving some groups toward simpler but sometimes deadlier bombing operations.

Some terrorist groups before the 1990s often were limited by fears that too much violence could backfire. In other words, experts say, terrorist groups wanted to find the proverbial sweet spot: they sought to use enough shocking violence to bring attention to a cause they felt had been neglected, but they did not want to use so much violence that their audiences abroad would become permanently alienated. Nor did nationalist terrorist groups—such as the Palestine Liberation Organization or the Irish Republican Army (IRA)—want to go so far that they dried up support among their own people.

These considerations often affected choices of targets as well as the level of violence. Between 1969 and 1993, for instance, less than a fifth of the IRA's victims were Protestant civilians, reflecting a deliberate choice to avoid alienating potential Irish supporters. As the terrorism expert Brian Jenkins has put it, terrorists used to want a lot of people watching, not a lot of people dead.

Types of terrorism There are at least six different sorts of terrorism identified: nationalist, religious, state-sponsored, left-wing, right-wing, and anarchist.

Nationalist terrorists seek to form a separate state for their own national group, often by drawing attention to a fight for "national liberation" that they think the world has ignored. This sort of terrorism has been among the most successful at winning international sympathy and concessions. Experts say that nationalist terror groups have tended to calibrate their use of violence, using enough to rivet world attention but not so much that they alienate supporters abroad or members of their base community. Nationalist terrorism can be difficult to define, since many groups accused of the practice insist that they are not terrorists but freedom fighters.

Nationalist terrorist groups include the Irish Republican Army and the Palestine Liberation Organization, both of which said during the 1990s that they had renounced terrorism. Other prominent examples are the Basque Fatherland and Liberty, which seeks to create a Basque homeland separate from Spain, and the Kurdistan Workers' Party, which seeks to create a Kurdish state independent from Turkey. Earlier nationalist terror groups sought to expel colonial rulers; such groups

included the Irgun and the Lehi (both Jewish militias opposed to British rule in Palestine in the 1940s) and the National Liberation Front (opposed to French rule in Algeria in the 1950s).

Religious terrorists seek to use violence to further what they see as divinely commanded purposes, often targeting broad categories of foes in an attempt to bring about sweeping changes. Religious terrorists come from many major faiths, as well as from small cults. This type of terrorism is growing swiftly, notes Bruce Hoffman of the RAND think tank; in 1995 (the most recent year for which such statistics were available), nearly half of the 56 known, active international terrorist groups were religiously motivated. Because religious terrorists are concerned not with rallying a constituency of fellow nationalists or ideologues but with pursuing their own vision of the divine will, they lack one of the major constraints that historically has limited the scope of terror attacks, experts say. As Hoffman puts it, the most extreme religious terrorists can sanction "almost limitless violence against a virtually open-ended category of targets: that is, anyone who is not a member of the terrorists' religion or religious sect."

Examples include Osama bin Laden's al-Qaeda network, the Palestinian Sunni Muslim organization Hamas, the Lebanese Shiite group Hezbollah, the radical Jewish groups affiliated with the late Rabbi Meir Kahane, the Israeli extremists Baruch Goldstein (who machine-gunned Muslim worshipers in a Hebron mosque in 1994) and Yigal Amir (who assassinated then Prime Minister Yitzhak Rabin in 1995), some American white-supremacist militias, and the Aum Shinrikyo doomsday cult in Japan.

State-sponsored terrorist groups are deliberately used by radical states as foreign policy tools—as Hoffman puts it, as "a cost-effective way of waging war covertly, through the use of surrogate warriors or 'guns for hire.'" One important early case was the Iranian government's use of supposedly independent young militants to seize hostages at the American embassy in Tehran in 1979. With enhanced resources at their disposal, state-sponsored terrorist groups are often capable of carrying out more deadly attacks than other terrorists, including airplane bombings.

The US State Department says Iran is the primary state sponsor of terrorism today; it also accuses Cuba, Iraq, Libya, North Korea, Sudan, and Syria of sponsoring terrorism.

State-sponsored terrorist groups include Hezbollah (backed by Iran), the Abu Nidal Organization (which has been backed by Syria, Libya, and Iraq), and the Japanese Red Army (which often worked on contract for Libya).

Some experts saw the Taliban's rule in Afghanistan as a new wrinkle in the phenomenon of state-sponsored terrorism. Since the Taliban worked so closely with al-Qaeda while in power, some experts considered Taliban-ruled Afghanistan to be a state that was, to some degree, run by a terrorist group.

Left-wing terrorists are out to destroy capitalism and replace it with a communist or socialist regime. Because they see most civilians as suffering from capitalist exploitation, left-wing terrorists sometimes have limited their use of violence to avoid hurting the victims they say they want to save. Left-wing terrorists sometimes focus instead on such tactics as kidnapping tycoons or bombing monuments.

The Baader-Meinhof Group (Germany), the Japanese Red Army, the Weathermen (1970s America), and the Red Brigades (Italy) are examples of left-wing terrorist groups.

Right-wing terrorists are among the least organized terrorists, often associated with neo-Nazi street rioting in Western Europe, especially in the early 1980s. These groups, often dominated by skinheads, seek to do away with liberal democratic governments and create fascist states in their place. Neofascist terrorists frequently attack immigrants and refugees from the developing world and are both racist and antisemitic.

Anarchist terrorism was a major global phenomenon from the 1870s until about 1920. Revolutionaries seeking to overthrow established governments launched a wave of bombings and assassinated a series of heads of state; one such victim was President William McKinley, killed in 1901 by a young Hungarian refugee influenced by anarchist sentiments. Some experts see signs of a new interest in anarchist violence arising out of the recent wave of protests against globalization.

SUICIDE TERROR

Most terrorism throughout history has carried a high risk of death for the terrorists themselves. As the historian Walter Laqueur observes, traditionally "the main weapon of the attack was the dagger, and unless

the victim could be found alone and defenseless," early terrorists "were unlikely to return from their missions." And the makeshift bombs used by nineteenth-century anarchists and Russian revolutionaries "were so unstable that they had to be thrown from a short distance (that is, if they did not explode first in the hands of the attacker). Those who went on an attack of this kind were fully aware of the risk and many of them wrote farewell letters to their friends and families."

The development of more sophisticated weapons in the twentieth century allowed terrorists to kill from a distance. At the same time, many groups got over their inhibitions about killing large numbers of innocent victims indiscriminately, so close-up targeting became less necessary. These factors made attacks less risky and de facto suicide terrorism less common. But suicide terrorism has reemerged with a vengeance in the last two decades as a favored tactic of certain terrorist groups, experts say. Among the reasons these groups choose suicide terrorism are the fear it generates and the ability to execute accurate, large-scale attacks without sophisticated technology.

The largest number of suicide terrorist attacks in recent years have come from the Liberation Tigers of Tamil Eelam (LTTE, or Tamil Tigers), a separatist group fighting the government of Sri Lanka. Using suicide attackers, the Tigers managed to kill two heads of state, Indian Prime Minister Rajiv Gandhi, in 1991, and Sri Lankan President Ranasinghe Premadasa, in 1993.

The phenomenon reaches far beyond Sri Lanka, however. Other groups that have embraced suicide terrorism include the Kurdistan Workers' Party (PKK), a Kurdish, Marxist separatist group fighting the government of Turkey; Hezbollah, an Iranian-backed group of Shiite Islamists based in Lebanon; and al-Qaeda, Osama bin Laden's network of radical Sunni Islamists. And while not technically terrorism, the kamikaze attacks of Japanese pilots during World War II also showed a willingness to use suicide as a weapon. The concept of self-sacrifice "is not specific to any given culture," argues the Wesleyan University terrorism expert Martha Crenshaw.

The most recent wave of suicide terrorism began with attacks by Hezbollah in Lebanon in 1983. The tactic was adopted by the Tamil Tigers in Sri Lanka in 1987, by the Palestinian Islamist group Hamas in Israel in 1994, and by the PKK in Turkey in 1996. Al-Qaeda embraced suicide terrorism in the mid-1990s when the network began planning the

1998 bombings of the U.S. embassies in Kenya and Tanzania and other attacks. The second Palestinian *intifada* (uprising), which began in 2000, has featured numerous suicide attacks from both religious and secular Palestinian terrorist groups. In May 2002, FBI director Robert S. Mueller III said future suicide attacks on American soil are "inevitable."

Experts say suicide terrorists are deeply committed to their causes and see themselves as martyrs. "Self-sacrifice is a way of legitimizing a cause, inspiring imitation, and promising individual glory," argues Wesleyan's Crenshaw. Ttypical Middle Eastern suicide bombers were usually thought to be "poor, not very well educated, and possibly psychologically damaged young men in their early 20s." Experts used to argue that men who were older, better educated, and had more social status would be less inclined to kill themselves. "This would normally have been a good bet, but the September 11 attackers were older—particularly those who clearly knew it was to be a suicide mission," writes Jenkins. "They had better educations and appear to have been far more sophisticated than their predecessors. Women have carried out around one-third of the LTTE's suicide attacks and two-thirds of the PKK's. Both of these groups, along with the Syrian Socialist Nationalist Party, have used ostensibly pregnant women to get past security checks on the way to their targets. In early 2002, the first female Palestinian suicide bombers appeared.

Rarely. suicide terrorists work on their own. Experts generally agree that instead of thinking of suicide terrorists as passionate people driven to kill themselves and others out of a spontaneous surge of emotion, we should regard them as a sort of guided missile, carefully prepared and launched by some larger, organized terrorist group. In other words, suicide terrorism is chiefly a deliberate tactic used by terrorist groups, not an individual act of rage.

Suicide terrorism is especially dangerous, because it can make it easier for terrorist groups to achieve dramatic results. Once the suicide terrorist is psychologically ready for the job, planning the rest of the operation can be less complicated than it would be if the terrorist's life needed to be safeguarded. (For instance, the September 11 pilots did not need to learn how to land a plane, only how to fly it into a building.) A clever and determined suicide terrorist, moreover, may be able to get closer to a target than other delivery methods could and can make last-minute tactical decisions—like swerving toward crowds or pausing

before they detonate until more potential victims gather—that render their attacks more effective and more deadly.

TERRORISTS AND MEDIA

The scholar Brian Jenkins declared in 1974 that "terrorism is theatre," and terrorists themselves have long seen it much the same way. Narodnaya Volya, the late-19th-century Russian anarchist group, conceived of its violent activities as "propaganda by deed." Ever since, terrorists have tailored their attacks to maximize publicity and get their messages out through all available channels. Experts say the attacks on the World Trade Center and the Pentagon, for example, were designed to provide billions of television viewers with pictures symbolizing U.S. vulnerability, and they prompted extensive reporting on al-Qaeda and its Islamist agenda.

However, some experts say that the nature of terrorism may now be changing. Jenkins has famously said that terrorists want a lot of people watching, not a lot of people dead. But the emergence of religious terror groups with apocalyptic outlooks and the availability of weapons of mass destruction may indicate that inflicting mass casualties has supplanted publicity as the primary goal of some terrorist campaigns.

Terrorists have learned to adapt their methods and messages as the media have evolved. Hijacking passenger airplanes, for example, became a common terrorist strategy only after the launch of the first international television satellite, which allowed viewers worldwide to watch hijackings as real-time dramas. More recently, al-Qaeda's strategy of not claiming responsibility for attacks—unlike earlier generations of terrorists—helps perpetuate insecurity and drive media coverage. The growth of satellite networks such as the Arabic cable news network al-Jazeera and of the video capabilities of the World Wide Web let terrorists make video recordings—for example, ones showing the murder of Daniel Pearl or Palestinian suicide bombers' last testaments—that can be seen even if CNN and the BBC decide not to show them.

Terrorists have learned to use the Internet for secret communications among themselves, facilitating planning and fund-raising, and they have promotional Web sites. However, experts say that information flow on the World Wide Web is hard to predict or control, and the

Internet isn't yet a way to reach everyone at once, as carrying out a spectacular televised attack is.

Narcoterrorism

Narcoterrorism refers to terrorist acts carried out by groups that are directly or indirectly involved in cultivating, manufacturing, transporting, or distributing illicit drugs. The term is generally applied to groups that use the drug trade to fund terrorism. However, it has also sometimes been used to refer to the phenomenon of increasingly close ties between powerful drug lords motivated by simple criminal profit and terrorist groups with political agendas, particularly in Colombia.

Some terrorist groups, like Colombia's FARC, collect taxes from people who cultivate or process illicit drugs on lands that it controls; others, including Hezbollah and Colombia's AUC, traffic in drugs themselves. Moreover, some terrorist groups are supported by states funded by the drug trade; Afghanistan's former Taliban rulers, for instance, earned an estimated $40 million to $50 million per year from taxes related to opium. The drug trade is also a significant part of the economies of Syria—which has funded terrorist organizations such as Hezbollah, the Popular Front for the Liberation of Palestine-General Command, and Palestinian Islamic Jihad—and Lebanon, a haven for numerous terrorist groups including Hezbollah and Hamas.

Terrorists turn to drug trafficking because they need money—for weapons, equipment, training, computers and other information systems, transportation, bribes, safe houses, forged passports and other documents, and even payroll. Drugs are a handy way to get cash—lots of it.

Terrorist groups participating in narcoterrorism

The Revolutionary Armed Forces of Colombia (FARC), a Colombian leftist group, raises funds by taxing coca farmers in the Switzerland-sized zone of the country it controls. FARC may force peasant farmers to grow the coca used to make cocaine. It also makes money by protecting cocaine laboratories and clandestine airstrips and by trafficking in drugs locally.

The National Liberation Army (ELN), another Colombian leftist group, taxes growers of marijuana and opium poppies and protects drug-

lab operations. But it generates far less of its funding from drugs than does FARC.

The United Self-Defense Forces of Colombia (AUC), which includes several right-wing paramilitary groups, says it gets 70 percent of its income from processing and exporting cocaine. It claims to be leaving the drug business, but experts doubt that all of its members will comply.

Remnants of Shining Path, a Peruvian leftist group, finance some operations by "protecting" cocaine smugglers in jungle areas under its control and by taxing the coca trade.

Some members of the Liberation Tigers of Tamil Eelam, a Sri Lankan separatist group, traffic in heroin, and the group reportedly has close ties to drug-trafficking networks in nearby Burma.

Hezbollah smuggles Latin American cocaine to Europe and the Middle East and has smuggled opiates out of Lebanon's Bekaa Valley, although poppy cultivation there is declining.

The Kurdistan Workers' Party (PKK), a Marxist separatist group based in Turkey, taxes ethnic Kurdish drug traffickers, and individual PKK cells traffic in heroin.

The Real IRA, an Irish Republican Army (IRA) splinter group that opposes the peace process in Northern Ireland, is suspected of trafficking drugs, although the extent of its involvement is unclear.

Basque Fatherland and Liberty (ETA), a separatist group in Spain, is reportedly involved in drug trafficking.

Al-Qaeda doesn't appear to have direct links to the drug trade. But its former protector in Afghanistan, the Taliban, supported itself in part through opium poppy production and trafficking.

Cyberterrorism

Cyberterrorism - terrorism that involves computers, networks, and the information they contain. Computer networks have been attacked during recent conflicts in Kosovo, Kashmir, and the Middle East, but the damage has mostly been limited to defaced Web sites or blocked Internet servers. However, with modern society increasingly interconnected and ever more dependent on information technology, terrorism experts worry that cyberterrorist attacks could cause as much devastation as more familiar forms of terrorism.

Terrorists try to leverage limited resources to instill fear and shape public opinion, and dramatic attacks on computer networks could provide a means to do this with only small teams and minimal funds. Moreover, "virtual" attacks over the Internet or other networks allow attackers to be far away, making borders, X-ray machines, and other physical barriers irrelevant. Cyberterrorists would not need a complicit or weak government (as al-Qaeda had in Afghanistan) to host them as they train and plot. On-line attackers can also cloak their true identities and locations, choosing to remain anonymous or pretending to be someone else.

Terrorists might also try to use cyberattacks to amplify the effect of other attacks. For example, they might try to block emergency communications or cut off electricity or water in the wake of a conventional bombing or a biological, chemical, or radiation attack. Many experts say that this kind of coordinated attack might be the most effective use of cyberterrorism.

Cyberterrorism could involve destroying the actual machinery of the information infrastructure; remotely disrupting the information technology underlying the Internet, government computer networks, or critical civilian systems such as financial networks or mass media; or using computer networks to take over machines that control traffic lights, power plants, or dams in order to wreak havoc.

Attacks on the physical components of the information infrastructure would resemble other conventional attacks: for example, a bomb could be used to destroy a government computer bank, key components of the Internet infrastructure, or telephone switching equipment. Another option would be an electromagnetic weapon emitting a pulse that could destroy or interrupt electronic equipment.

Attacks launched in cyberspace could involve diverse methods of exploiting vulnerabilities in computer security: computer viruses, stolen passwords, insider collusion, software with secret "back doors" that intruders can penetrate undetected, and orchestrated torrents of electronic traffic that overwhelm computers—which are known as "denial of service" attacks. Attacks could also involve stealing classified files, altering the content of Web pages, disseminating false information, sabotaging operations, erasing data, or threatening to divulge confidential information or system weaknesses unless a payment or political

concession is made. If terrorists managed to disrupt financial markets or media broadcasts, an attack could undermine confidence or sow panic.

Attacks could also involve remotely hijacking control systems, with potentially dire consequences: breaching dams, colliding airplanes, shutting down the power grid, and so on.

The Tamil Tigers have mounted on-line attacks against the government of Sri Lanka. The Japanese doomsday cult Aum Shinrikyo, which released sarin gas in the Tokyo subway system in 1995, had previously built a system for tracking Japanese police vehicles, and investigators discovered that the group possessed classified data regarding these vehicles. Other foreign terrorist organizations also use the Internet for communications and propaganda, but it's hard to know who has cyberterrorist capabilities until they try something. Cyber-attacks often lack the drama of traditional terrorist attacks, so they might not be attractive to some terrorist groups.

Experts stress vigilance about computer security: patching security flaws quickly once they're detected, designing systems to withstand attacks, backing up systems off-site so they can bounce back quickly from a disruption, watching for disgruntled employees who might help terrorists penetrate a system.

Terrorist groups

Hamas, Islamic Jihad (Palestinian Islamists)
Al-Aqsa Martyrs Brigades (Palestinian nationalists)
PFLP, DFLP, PFLP-GC (Palestinian leftists)
Hezbollah (Lebanon, Islamists)
Jamaat al-Islamiyya, Egyptian Islamic Jihad (Egypt, Islamists)
Armed Islamic Group (Algeria, Islamists)
Kashmir Militant Extremists (Kashmir, Islamists)
Mujahedeen-e-Khalq (Iranian rebels)
Abu Nidal Organization (Iraq, extremists)
Kach, Kahane Chai (Israel, extremists)
Chechnya-based Terrorists (Russia, separatists)
East Turkestan Islamic Movement (China, separatists)
Kurdistan Workers' Party (Turkey, separatists)
Jemaah Islamiyah (Southeast Asia, Islamists)
Abu Sayyaf Group (Philippines, Islamist separatists)
Liberation Tigers of Tamil Eelam (Sri Lanka, separatists)

Irish Republican Army (U.K., separatists)
IRA Splinter Groups (U.K., separatists)
Northern Ireland Loyalist Paramilitaries (U.K., extremists)
Basque Fatherland and Liberty (Spain, separatists)
November 17, Revolutionary People's Struggle (Greece, leftists)
FARC, ELN, AUC (Colombia, rebels)
Shining Path, Tupac Amaru (Peru, leftists)
Aum Shinrikyo (Japan, cultists)
American Militant Extremists (United States, radicals)

WEAPONS OF MASS DESTRUCTION

Biological weapons

Bioterrorism, and biowarfare, are not new concepts. Human beings have been aware for a long time of the power of infectious diseases. Since ancient times, infectious diseases have appeared in frightening and devastating ways. The Black Death of the Middle Ages wiped out perhaps one-third of Europe's population with major demographic impacts. The influenza of 1918–1919, the so-called Spanish Flu, was a naturally occurring disease which may well have been the greatest recorded natural disaster in history, with probably 25 million deaths worldwide during the period of its enormous outbreak. Today, smallpox is so far the only infectious disease to be eradicated as a natural infection and even that is now back in our consciousness as a potential threat from bioterrorists. The same – anthrax.

Germany tried halfheartedly to use anthrax during World War I. During World War II, most warring parties had biowarfare programs; Japan used anthrax in China. During the Cold War, both the United States and the Soviet Union set up large biowarfare programs. President Nixon banned the production and use of biological warfare agents in 1969. The Soviets carried on; in 1979, an anthrax leak from a Soviet weapons plant killed more than 60 people.

Many letters containing anthrax were sent out in the 2001 attacks. Four contaminated letters were found: Contaminated letters to the *York Post* NBC's Tom Brokaw had a September 18, 2001, postmark. Letters to Senator Tom Daschle and Senator Patrick Leahy, postmarked October 9, carried a more potent form of anthrax. Confirmed anthrax

cases at American Media, in Florida, and at the New York offices of CBS and ABC suggest that letters were also sent to these offices.

Twenty-three people contracted anthrax from these letters, according to the Centers for Disease Control and Prevention (CDC) and five died.

Besides anthrax and smallpox, the bacteria that cause plague and tularemia, the toxin that causes botulism, and hemorrhagic fever viruses (HFVs) such as Ebola and Marburg are the biological agents that make us most worried. Terrorist groups could use these agents, but no easily. Precisely because they are so deadly and contagious, these microbes are dangerous to work with. Moreover, in order to cause mass casualties, terrorist groups would need to develop an effective means of dispersing them through the air, which would be difficult without specialized technical assistance. These agents would have to be converted into tiny particles by a specialized sprayer or milled into a very fine powder, then dispersed in an aerosol. Once aerosolized, an invisible cloud of the agent would remain suspended in the atmosphere, where it could be inhaled deep into victims' lungs. But neither specialized sprayers nor milled, "superfine" versions of these agents are easy to come by.

- The United States and the Soviet Union developed some of these agents in bioweapons programs that were later discontinued.
- More recently, Iraq and North Korea are thought to have conducted bioweapons research with plague bacteria.
- Iraq, North Korea, Iran, and Syria are believed to have developed botulinum toxin as a weapon. After the 1991 Gulf War, Iraq told U.N. weapons inspectors that it had produced 19,000 liters of concentrated botulinum toxin—enough, theoretically, to kill everyone on earth three times over.
- During a 1992 trip to Zaire, operatives from the Japanese doomsday cult Aum Shinrikyo tried unsuccessfully to acquire samples of the Ebola virus, and some experts think that an Iraqi viral strain code-named "Blue Nile" may be Ebola.
- Finally, experts warn that because microbe collections in Russia, Kazakhstan, Georgia, and Uzbekistan are not adequately secured, terrorist groups or states might be able to steal or otherwise obtain weaponized strains of plague, tularemia, and HFVs.

Chemical weapons

Sarin is one of the world's most dangerous chemical warfare agents. Sarin is an extremely toxic substance that disrupts the nervous system, overstimulating muscles and vital organs. It can be inhaled as a gas or absorbed through the skin. In high doses, sarin suffocates its victims by paralyzing the muscles around their lungs. One hundred milligrams of sarin—about one drop—can kill the average person in a few minutes if he or she's not given an antidote. Sarin is more than 500 times as toxic as cyanide.

Sarin was used in 1995 by Aum Shinrikyo, a Japanese doomsday cult, in a terrorist attack on the Tokyo subway system that killed 12 and sent more than 5,000 people to hospitals. A year earlier, the cult killed seven people in a sarin gas attack in the central Japanese city of Matsumoto.

There are unconfirmed reports that Afghanistan's ousted Taliban rulers and Osama bin Laden's al-Qaeda terrorist network tried to make chemical weapons, including sarin and VX, another deadly nerve agent. U.S. officials say they're aware of al-Qaeda's interest in possessing such weapons but haven't accused the group of actually having them.

Known by its U.S. Army code name, VX is the deadliest nerve agent ever created. It is a clear, colorless liquid with the consistency of motor oil. A fraction of a drop of VX, absorbed through the skin, can kill by severely disrupting the nervous system. Although a cocktail of drugs can serve as an antidote, VX acts so quickly that victims would have to be injected with the antidote almost immediately to have a chance at survival. VX is the only significant nerve agent created since World War II.

Could terrorists use VX? It's unlikely but possible. Synthesizing VX is complicated and extremely dangerous. It requires the use of toxic and corrosive chemicals and high temperatures in a sophisticated chemical laboratory. Still, the Japanese doomsday cult Aum Shinrikyo, which recruited trained chemists from Japanese universities, managed to synthesize small quantities of VX to use for assassinations. Terrorists lacking access to trained organic chemists might be more likely to steal a munition containing VX from a poorly guarded chemical weapons depot in a country such as Russia.

Iraqi President Saddam Hussein used mustard gas on Kurds in northern Iraq during a 1987-88 campaign known as the Anfal. The worst

attack occurred in March 1988 in the Kurdish village of Halabja; a combination of chemical agents including mustard gas, sarin, and possibly VX killed 5,000 people and left 65,000 others facing severe skin and respiratory diseases, abnormal rates of cancer and birth defects, and a devastated environment. Experts say Saddam also launched about 280 smaller-scale chemical attacks against the Kurds.

Nuclear weapons

The former Soviet republics of Ukraine, Belarus, and Kazakhstan—where the Soviets based many of their nuclear warheads—safely returned their Soviet nuclear weapons to post-communist Russia in the 1990s, but all three countries still have stockpiles of weapons-grade uranium and plutonium. Moreover, Ukraine and Kazakhstan have nuclear power plants whose byproducts could not be used to make a nuclear bomb but might still tempt terrorists trying to make a "dirty bomb" —a regular explosive laced with lower-grade radioactive material.

Some experts also worry about Pakistan, a relatively recent nuclear power and now a key coalition member in the war on terrorism with untested security systems, dozens of nuclear weapons, and many Islamist militants who sympathize with Osama bin Laden. The United States recently offered to help Pakistan improve its nuclear security measures. Pakistan reportedly began quietly accepting American help in early November 2001.

There have been no confirmed reports of missing or stolen former Soviet nuclear weapons. Still, there is ample evidence of a significant black market in nuclear materials. The International Atomic Energy Agency (IAEA) has reported 175 nuclear smuggling incidents since 1993, 18 of which involved highly enriched uranium, the key ingredient in an atomic bomb and the most dangerous product on the nuclear black market.

Building a nuclear bomb is not easy, although the consequences of terrorists' doing so could be so devastating that the problem is worth worrying about. Building nuclear weapons is difficult even for countries with money, infrastructure, and scientific resources. But experts note that building a crude, bulky, low-yield nuclear weapon deliverable by truck or ship would be far easier than making the compact, reliable, high-yield weapons found in U.S. arsenals—and might well also be

easier than stealing an atomic weapon. Still, terrorists would probably find it far easier to use conventional weapons such as guns and nonnuclear bombs; stage inventive attacks like the September 11 hijackings; or build cruder, far less dangerous radiation weapons such as "dirty bombs."

A "dirty bomb," also known as a radiological weapon, is a conventional explosive such as dynamite packaged with radioactive material that scatters when the bomb goes off. A dirty bomb kills or injures through the initial blast of the conventional explosive and by airborne radiation and contamination—hence the term "dirty." Such bombs could be miniature devices or as big as a truck bomb.

To make a "dirty bomb" takes not much more expertise than it takes to make a conventional bomb. No special assembly is required; the regular explosive would simply disperse the radioactive material packed into the bomb. The hard part is acquiring the radioactive material, not building the bomb. *The Washington Post* reported in March 2002 that the Bush administration's consensus view was that Osama bin Laden's al Qaeda terrorist network probably had such often-stolen radioactive contaminants as strontium 90 and cesium 137, which could be used to make a dirty bomb. In January 2003, British officials found documents in the Afghan city of Herat that led them to conclude that al Qaeda had successfully built a small dirty bomb. In late December 2003, homeland security officials worried that al Qaeda would detonate a dirty bomb during New Year's Eve celebrations or college football bowl games, according to *The Washington Post*. The Department of Energy sent scores of undercover nuclear scientists with radiation detection equipment to key locations in five major U.S. cities, *the Post* reported.

The relative ease of constructing such weapons makes them a particularly worrisome threat. Even so, expertise matters. Not all dirty bombs are equally dangerous: the cruder the weapon, the less damage caused. We don't know if terrorists could handle and detonate high-grade radioactive material without fatally injuring themselves first.

RESPONSE

Effective response to a terrorist incident hinges on comprehensive planning and interagency cooperation. Address and resolve jurisdictional issues well in advance. After a plan has been devised, update it

regularly to reflect changes in resources, population, terrorist activities, or potential targets. Local police, fire, EMS, and Disaster & Emergency Services (DES) agencies should form the first line of response. Other agencies that may be involved include the following:

- Secret Service
- State disaster agencies
- Military or reserve units
- Specialized medical units

An act of terrorism in a metropolitan area may cause major health and medical consequences that could rapidly overwhelm virtually all local health facilities; thus, ongoing contact with state and national agencies is recommended highly.

Most of the principles of incident management are similar to those of mass casualty incidents. Primary concern in potential terrorist incidents is to secure the area and to ascertain the severity and nature of the threat. Keep in mind that delayed explosives or materials intended to harm rescue workers may have been planted at the site. Primary and secondary perimeters must be established and secured. Determine if a cleared, downwind perimeter is needed, and establish one if required.

Early involvement of support and ancillary services, mutual aid agencies, and local agencies in the planning process is prudent. After identifying the potential threat, determine which type of protective equipment is necessary. Emphasis must be placed on decontamination and protection of rescuers and victims.

After establishing a decontamination and triage area, rescuers should put on appropriate protective clothing before entering the affected area and beginning rescue efforts. The first focus is on supportive care with emphasis on aggressive airway control and decontamination. Issues associated with simultaneous containment, neutralization, and/or decontamination may be addressed by ancillary agencies. Following initial triage, patients are given primary or aggressive aid depending on their presentation and the resources available. Decontaminate and transport patients to a facility that has been informed about the etiology of the incident as soon as feasible. Secure and clean the area to complete the physical response. Record keeping, analysis of the incident, and investigations conclude the complete response.

Responding to a terrorist event can represent a tremendous drain on resources for all agencies involved. The potential for death and destruc-

tion is tremendous. Agencies responsible for responding to terrorist events can reduce potential injury, illness, and death only through complete and ongoing planning.

REFERENCIES

1. Franz DR, Jahrling PB, Friedlander AM: Clinical recognition and management of patients exposed to biological warfare agents. JAMA 1997 Aug 6; (5): 399-411
2. Holstege CP, Kirk M, Sidell FR: Chemical warfare. Nerve agent poisoning. Crit Care Clin 1997 Oct; (4): 923-42
3. Howell JM, Altieri M, Fletcher J, eds: Emergency Medicine. W B Saunders Co; 1998.
4. Leonard RB, Teitelman U: Manmade disasters. Crit Care Clin 1991 Apr; (2): 293-320.
5. May HL, et al: Emergency Medicine, 2nd ed. Little, Brown, and Company; 1992.
6. Michael N. Coster, Robin K.S. Hankin Risk assessment of antagonistic hazards / Journal of Loss Prevention in the Process Industries 16 (2003) 545–550
7. Noah DL, Sobel AL, Ostroff SM: Biological warfare training: infectious disease outbreak differentiation criteria. Mil Med 1998 Apr; 163(4): 198-201.
8. Patrice Binder, Olivier Attre, Jean Paul Boutin, Jean Didier Cavallo, Thierry Debord, Alain Jouan, Dominique Vidal. Medical management of biological warfare and bioterrorism: place of the immunoprevention and the immunotherapy/ Comparative Immunology, Microbiology & Infectious Diseases 26 (2003) 401–421
9. Rosen P, et al: Emergency Medicine: Concepts and Clinical Practice, 3rd ed. Mosby-Year Book; 1992.
10. S.S. Morse Biological and chemical terrorism / Technology in Society in press (2003)
11. Slater MS, Trunkey DD: Terrorism in America. An evolving threat. Arch Surg 1997 Oct; (10): 1059-66.
12. Smallpox: a potential agent of bioterrorism *R.J. Whitley / Antiviral Research 57 (2003) 7–12*

13. Sullivan JB, Krieger GR: Hazardous Materials Toxicology: Clinical Principles of Environmental Health. Baltimore: Williams & Wilkins; 1992.
14. Tintinalli J, Krome R, et al: Emergency Medicine: A Comprehensive Study Guide. McGraw-Hill; 1997.
15. V. Latora, M. Marchiori How the science of complex networks can help developing strategies against terrorism / Chaos, Solitons and Fractals 20 (2004) 69–75

DISASTERS

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INTRODUCTION

Disasters affect humankind on a permanent basis. Millions of people have been affected during the last few decades. More and more people are suffering from the consequences of the particular type of disasters called 'complex emergencies' (mainly the consequences of civil strife, terrorism, wars, and similar conflicts). Indeed the total number of refugees around the world is increasing and the number of civilians affected by complex emergencies is very high.

Man's experience down through the ages has frequently been attended by disasters of one kind or another. Our ancestors were tested by naturally occurring disasters, whereas their modern descendants are also exposed to man-made hazards. In addition to loss of life and permanent disability of the victims, disasters produce considerable material damage.

It is difficult to evolve a meaningful definition of the word disaster. Most dictionaries identify this as a calamity or major accident and, while this is correct, such a definition fails to reveal why a calamity or major accident should be a disaster. From a medical point of view it is important to construct a simple definition for a disaster and, at the same time, to outline the criteria for its classification. Definition, classification, and measurement creates a foundation for that part of medicine called disaster medicine.

'A disaster is a destructive event that causes a discrepancy between the number of casualties and their treatment capacity'.

Other words, in health and medical care, *disaster* means:

a situation in which the need of medical care exceeds the immediately available resources and in which extraordinary and coordinated measures are necessary if normal quality standards are to be maintained

The need for resources must have arisen through a sudden event. An accident not counting as a disaster if it occurs in a built-up area with good access to resources may entail the need to change to the disaster organisation if it occurs in a sparsely-populated area.

In health and medical care, *mass casualty situation* means:

a situation in which the load on medical facilities is so great in relation to available resources, even following reinforcement, that normal quality standards cannot be maintained

Both definitions are based on an imbalance between available resources and needs. A sudden increase in needs or a reduction in available resources may cause a disaster situation. The greater the imbalance, the more serious the consequences of the disaster will be.

The objective for medical measures in a disaster is to minimise the consequences in terms both of somatic sequelae and of psychological sequelae.

In a *mass casualty situation* also, war for example, the ambition must be to maintain the results of medical treatment at a normal level for the large majority of patients, even if this is by definition not always possible.

Achievement of these objectives requires an organisation with resources prepared to

- attend to and treat injured persons within a injury area
- transport the injured and give treatment during transport
- attend to and treat injured persons in hospital
- take preventive measures against psychological sequelae in the injured, relatives and staff involved in rescue work.

The injured are allocated to hospitals after qualified medical assessment and with regard to resources. At all levels, management of hospital work in collaboration with other parts of the rescue organisation is required.

The need of help is governed by several factors, chief among which are:

- the numbers of injured
- the types of injury
- distance to hospital
- available transport
- weather conditions
- time of day or night.

DISASTER RISKS

- The predominant disaster risks in Lithuania are *accident risks* (transport accidents, chemical and biological accidents, radiation accidents, fires, explosions).
- The risk of *natural disasters* (e.g. earthquakes, typhoons, floods, drought) with large numbers of dead and injured is small in Lithuania.
- *War and terrorism* can of course lead to serious mass injury situations. At the same time supply problems can arise with pronounced shortages of resources as a consequence.

Classification

Disasters may be classified according to:

1. The effect on the surrounding community, with further differentiation into a simple effect and compound effect. In the case of a simple disaster, the integrity of the surrounding community remains intact, and the (extra) resources of the local and regional rescue services prove adequate to deal with the situation. Should a compound disaster occur, in which case the resources available locally and regionally are unable to cope alone, the involvement of national and international organisations is required. A railtraffic accident involving a passenger train in a West European country might be given as an example of a simple disaster whereas an earthquake in a densely populated region of North Africa could give rise to a compound disaster.

2. The cause: In this case, a differentiation is drawn between naturally occurring and cultural (man made) disasters. Man made disasters are generally less complicated and more confined than natural disasters.

3. The duration of the cause of disaster: This can be short (less than 1 hour), relatively long (24 h), or long (more than 24 h). The majority of simple disasters occurs instantaneously, while compound disasters are usually characterised by a longer initiation time (e.g. earthquakes, famines, epidemics).

4. The radius of the disaster area: This can be small (less than 1 km), relatively large(10 km), or large (more than 10 km). From a medical viewpoint, the 'disaster area' implies that area in which casualties

have fallen. It is not, therefore, that area characterised by damage, for example, broken glass.

5. The number of casualties: An arbitrary division of the number of casualties is made as follows:

minor: 25-100 casualties, dead and wounded, requiring medical treatment; moderate: 100-1000 casualties, dead and wounded, requiring medical treatment; major: more than 1000 casualties, dead and wounded requiring medical treatment;

Even a few casualties may give rise to enormous problems to unprepared communities, whereas large numbers of injured may hardly exhaust resources that are adequate and well organised. From a medical point of view, the casualties requiring admission to hospital comprise the crucial group; the dead and slightly injured, who do not require inpatient treatment, are, in this respect, less important.

6. The average severity of the injuries sustained by living victims. Disaster may result in a relatively large number of seriously injured or there may be a relatively large number of slightly injured or sick, requiring no hospitalisation.

7. The time required by the rescue organisations for initiation of primary treat ment, organisation of transport facilities, and evacuation of the injured could be short (less than 6 hours), relatively long (24 hours) or long (more than 24 hours).

In the case of a compound disaster in such an area, the primary treatment time will be that time required for the institution of the most urgent first aid measures at the site, followed by definitive medical treament.

By attributing to the individual classification a grade of 0,1 and 2, the score itself increasing with gravity, duration, number, or intensity, a figure is obtained which is the sum of the variously accorded scores and which lies between 1 and 13. This scale is called the Disaster Severity Scale *(DSS).* In order to avoid scale 0, the options of classification 1 were chosen as 1 and 2, instead of 0 and 1.

The Armenian earthquake in 1988 was a compound disaster (score 2), of natural origin (score 1), the duration of the cause was relatively long (score 1), the radius of the disaster was more than 10 km (score 2), the number of casualties amounted to 50,000 (score 2) with many seriously wounded victims (score 2), while the time required by the rescue organisations was long (score 2). Summation of the individual score re-

sulted in scale of 12.

The Prinsenbeek disaster in 1972 on the other end of the scale was a simple one (score 1), of man made origin (score 0), the duration of the cause was short (score 0), the radius of the disaster area small (score 0), the number of casualties requiring hospitalisation amounted to 100 (score 0), with a 'normal' distribution of categories (score 1), while the time required by the rescue organisation was short (score 0). Summation of the individual scores resulted in a scale of 2.

Table 1. **Disaster severity scale**

Scale	Location	Cause	Date
12	Armenia (USSR)	Earthquake	1988
11	The Netherlands(NL)	Floods	1953
10	Bhopal (India)	Poisonous gas	1984
9	Mexico City (Mexico)	Earthquake	1981
8	Texas City (USA)	Explosion	1947
7	Tenerife (Spain)	Traffic	1977
6	Piper Alpha (UK)	Explosion	1988
5	Los Alfaques (Spain)	Explosion	1978
4	Zeebrugge(B)	Traffic	1987
3	Beek(NL)	Explosion	1975
2	Prinsenbeek (NL)	Traffic	1972

DISASTER RISKS

General

The concept of risk can be defined as the probability of an accident occurring and the conceivable negative consequences if one does. A distinction is made between disasters arising through human activity and natural disasters.

Natural and environmental disasters dominate internationally, represented 35% of all disasters and were responsible for 94% of all deaths.

The number of industrial disasters, particularly in connection with the manufacture or transport of dangerous substances, has increased in recent years. This alone was responsible for 5 000 deaths and over 100 000 injuries in the last 15 years.

A disaster situation can also arise where there is a sudden shortage of resources, e.g. where obstacles to trade arise, or obstacles to supply such as strikes.

Interruption of technical supplies (water, electricity, medical gases) can also lead to a disaster situation.

Natural disasters

Natural disasters strike hardest in countries with poor economies and undeveloped infrastructures. Such countries are often very densely populated and, at the same time, lack an effective emergency and disaster medical organisation. This means that, for example, typhoons, heavy storms, drought and starvation have much more serious consequences in developing countries than they do in industrialised countries.

The risk of natural disasters is fairly small in Lithuania, even though several have occurred in recent years, for instance the "Anatoly" storm in 1999. The numbers injured, however, have been small.

Floods

Floods often occur as a result of cloudbursts, storms or accidents to dams. The populations affected can be very large. The injury profile in floods is very irregular with most in the categories "dead" or "very slightly injured".

Earthquakes

Injuries suffered in earthquakes can also be very extensive. Where community infrastructure with technical supplies and communications is affected, rescue work can often be very complicated and delayed. Widespread collapse of buildings can occasion protracted rescue operations and many of the injured may be crushed for long periods. The numbers with multiple injuries can be large, as can be those with multiple organ failures.

DISASTERS RESULTING FROM ACCIDENTS

Transport accidents

Road traffic. Without being a disaster by definition, road traffic in Lithuania causes about 600 deaths a year while 8 000 people are injured.

In the western world and Japan during the last 30 years 5.5 million people have been killed and 230 million injured, of whom a quarter seriously.

Railway. There are 40-50 deaths annually in Lithuania in connection with railway accidents. Characteristic for railway accidents is a casualty profile of 10-20% deaths, 30-40% serious injuries (requiring hospital treatment) and 30-40% slightly injured.

Air. Except 2001, some 600 people a year died in air accidents in the western world. In air crashes the casualty profile is often unbalanced with either a large proportion killed or a large proportion slightly injured, but in certain circumstances there can be many seriously injured survivors in great need of emergency care.

Sea. The foundering of passenger ships has been common mainly in South-East Asia, but in recent years in our vicinity also (the ship accidents in Zeebrugge, the Scandinavian Star and Estonia fairy accidents) with a large number of deaths. As in air accidents, the casualty profile is often unbalanced with either a large number killed or many slightly injured.

Chemical and biological accidents

All handling and transport of chemicals entails risks. The Lithuanian rescue corps have in recent times dealt with a few hundreds of chemical accidents evrey year, mostly small leakages. The most common chemicals in these accidents are those handled and transported in large quantities, i.e. petrol, diesel oil, heating oil, sulphuric acid, ammonia, chlorine and hydrochloric acid.

Characteristic of chemical disasters are the enormous consequences that explosions or release of dangerous substances can have. This goes primarily for condensed gases (e.g. chlorine, ammonia). It is often necessary for people living in the area to stay indoors and shut windows and ventilation. In certain cases extensive evacuation of those living nearby may be required.

Fires or explosions in what are termed risk laboratories with dispersal of infectious biological substances are also a risk factor. In addition, rescue work is not infrequently complicated further by the risk of poisoning to which rescue personnel are exposed, and by the frequently un-

usual and resource-consuming symptoms (e.g. respiratory insufficiency with need of respirator) which many victims may exhibit.

Radiation accidents

Disasters involving ionising radiation can arise both at nuclear installations and from radiation sources within radiotherapy or industrial applications. While the consequences of accidents at stationary nuclear power installations are partly predictable, accidents during transport of radioactive material lead to effects that are more difficult to assess.

The medical effects of radiation are partly the acute injuries and partly latter damage associated with the increased risks of cancer. Among the later are also the hereditary risks that can be transmitted to coming generations. For early injury, the extent of whole-body radiation is decisive. Whole-body radiation in the dose interval 3-5 Sv leads to half the patients dying within six days unless treatment is given.

Acute radiation damage alone, or in combination with traumatic injuries, leads to serious problems of treatment because of disturbed immune defence, delayed healing and increased risk of infection. Early measures comprise primarily decontamination. As against this, early active measures are not required to the same extent as after trauma. During the first 24 hours blood sampling is needed for following white counts. Patients with radiation injury need among other things fluids and treatment against infection.

Fires

The Lithuanian rescue services carry out approximately 10000 fire-fighting operations a year. Almost 200 persons dye because of these accidents per year in Lithuania.

Disasters in which many are injured by fire place special demands upon medical care. Because of the small number of fire beds in burns units, burn patients must primarily receive attention at general surgical and plastic surgery departments. In a mass injury situation with very large numbers of burn cases, not only must beds in burns units abroad be used, but also treatment principles must be modified and more stringent priorities for advanced treatment followed.

Explosions

Explosions causing large numbers of casualties can occur both when explosive charges are detonated and when there are accidents with inflammable gases or liquids (Oclahoma, USA, Moscow, Russia).

Following an explosion, the pressure wave causes primary injuries, e.g. ruptured eardrums and burst alveoli, flying secondary projectiles inflict secondary injuries with extensive soft-tissue damage, and when persons are thrown about, tertiary injuries occur. In explosions of inflammable substances, burns and smoke injuries predominate.

War and terrorism

War and terrorist action can lead to serious mass injury situations. War is the disaster with the most serious consequences for medical care. At the same time as a large number of people are injured, supply problems often arise with ensuing pronounced shortages of resources. Peacetime disaster preparedness is therefore of great importance for medical care in time of war.

CASUALTY PROFILE

Of deaths from external violence about 50% occur immediately, 30% early and 20% long after the injury was inflicted.

Immediate death, i.e. within a few minutes, is largely due to brain damage and injury to the heart and large vessels. These injuries are seldom treatable. Another group of deaths is caused by airway obstruction and massive haemorrhage. In many of these cases death can be prevented through active measures.

Early deaths, due to external violence occur shortly after the injury: in about half the cases within the first 24 hours. They are usually caused by damage to the central nervous system, thoracic or abdominal injury with internal haemorrhage, extensive skeletal damage or multiple injuries with great loss of blood. These injuries are, with the exception of cranial injury, largely treatable but the time elapsing between injury and surgical treatment in hospital is critical.

Subsequent deaths, occurring days or weeks after the injury, are caused in nearly 80% of cases by infection with sepsis and multiple or-

gan failure with impaired or destroyed respiratory, kidney and liver function.

ACCIDENTS INVOLVING TOXIC SUBSTANCES

The use of hazardous materials in our consumer society is well accepted when it improves our living standards. However, chemicals can become a potential threat to the health and security of the community the moment they are released in the environment. Given our reliance on chemicals and the fact that tons of hazardous materials are produced, stored and transported by road, rail, water and air each year, some inadvertent release of hazardous chemicals is certain to occur. Chemical spills, releases, smaller scale accidents and near disasters are seen with sufficient frequency in the world to warrant serious attention to the potential for large-scale incidents. As the toxicity and volume of the hazardous materials increases, and the number of people potentially exposed is greater, the chance for harmful health effects increases. Without some knowledge and preparation, and in the absence of close coordination and communication, what appears to be a minor accident can quickly becomes a major catastrophe affecting an entire community.

Exposure of the civilian population to chemical war agents, as recently demonstrated by the release of a home-made variety of the nerve agent sarin in the subway in Tokyo, is favored by the ease and simplicity of access to the considerable stocks scattered all over the world and the very well known effects of these chemical agents. Owing to their high toxicity, their insidious nature and their powerful contaminating capacity, chemical war agents generate a feeling of insecurity or panic in a civilian population or even rescue personnel and may distort the assessment of the situation by the authorities/

Many chemicals are manufactured and handled in industry. Large quantities of chemicals are transported every day by road, rail, sea and air. In the modern community the chemicals industry is a precondition for our present standard of living.

But the handling of chemicals also involves risks. The risk that chemical accidents may occur has become increasingly appreciable. Many of these chemicals may, in an accident or during transport, cause serious injuries to man and damage to the environment. If chemicals are mixed by mistake, toxic gases form and are disseminated (e.g. carbon

monoxide and hydrogen cyanide, irritant gases). This may also occur in a fire.

The number of chemical substances in the widest meaning is very large. In 1942 approximately 60,000 chemical substances were known, but today there are over nine million and some 300,000 new substances appear every year. Most of these substances, however, lack practical use. Today there are some 70,000 chemical substances in practical use, and the number grows by about 1,000 new substances annually. Approximately 3,000 of these are responsible for 90% of the applications.

Ammonia, chlorine, sulphur dioxide and petroleum products are produced, stored and transported in large quantities in the chemicals industry.

Accidents occur in all parts of the world in factories, during transport by road and rail and in pipelines.

It is often unfortunate circumstances that make the difference between an incident and a serious accident. Unfavorable weather conditions such as light wind and simultaneous inversion (atmospheric layers of warmer air above colder air), and time of day, are factors that may lead to a relatively slight release of e.g. a toxic gas affecting many people.

Hazardous Substances

By hazardous substances is meant the transport, loading and unloading of:

- explosive,
- flammable,
- corrosive,
- toxic,
- radioactive and other substances

that can cause injury to humans and animals, and damage to property or the environment.

On this definition, most substances can be reckoned as hazardous substances. In medical care the term chemical accidents is used which, however, does not include substances that are explosive or radioactive.

Sports installations etc

Chemical substances are used not only in industry, but in many

other places in the community. Thus for example ammonia is used in skating rinks, swimming pools and refrigeration plants.

Injury potential

Chemical substances themselves possess great potential for damage, i.e. they can injure/contaminate large numbers of people. With an instantaneous release of fifty tons of chlorine in a densely populated area in summer, from railway tank trucks where the whole contents leaks out at once, the following casualty outcome may be assumed:

- 300—400 immediate deaths
- 400 casualties requiring immediate respiratory care
- 2000 casualties requiring immediate hospital care for breathing difficulties
- 2000 casualties requiring hospital observation for at least two days.

However, it is common that the damage is considerably less with only a small number of casualties.

Even a fairly small accident can involve problems in view of the risk of dissemination of the dangerous substance and the complex casualty picture. In addition, there are often initial difficulties in obtaining a clear appreciation of the scope of the damage, which makes direction of the operation difficult. Sometimes it is even unclear what substance or substances are involved and how dangerous these are, individually or in combination. Should there be a fire it is even more difficult to assess the risk of injury and the size of the risk area.

EXAMPLES OF ACCIDENTS

Ammonia

In March 1989 there was a breakdown of an ammonia system in an artificial fertiliser plant in Lithuania. Fire broke out and spread to a building some 50 metres from the ammonia cistern in which nitrophosphate was produced. Seven persons lost their lives and at least 55 were more or less seriously injured.

FIRES

Fires involving toxicity

In November 1997 there was fire in the underground railway station at King's Cross in London. The fire started in an escalator and was probably caused by a match that was discarded and fell between the steps of the escalator and a side wall. Inflammable gases were generated and these collected in the space below the escalator and spread further to the spaces above and to the ticket hall. Suddenly there was rapid combustion. The toxic gases were formed during the burning of material in the ceiling and walls. Thirty-one persons died and over 60 were injured. All those who died did so as a consequence of exposure to hydrogen cyanide formed when plastic material in the roof and walls caught fire.

In spring 1990 there was a fire on the passenger ferry Scandinavian Star in traffic between Oslo and Copenhagen. A total of 158 persons died and most, more than 90%, died as a consequence of exposure to toxic gases formed during the burning of material on the ship. The toxic gases were carbon monoxide and hydrogen cyanide.

Fires involving the release of chemicals

The Schweizerhalle accident at the Sandoz factory in Basle in November 1986 is an example of an accident that entailed considerable ecological damage.

The water used to extinguish the fire, which had started on premises used for storing large quantities of chemicals, ran down into the River Rhine. In this accident no persons were injured, but in large stretches of the Rhine considerable damage to plant and animal life was found.

In September 1955 there was an explosion followed by a fire in an agricultural product store in Rwanda. The store contained 232 tons of an anti-fungus preparation (Mancozeb). The fire probably started through self-ignition. While it was being extinguished, approximately 75,000 1 of water mixed with the chemical ran out into a nearby river. The whole river was colored yellow by the water. No acute toxic effects were to be expected from this accident since Mancozeb has low acute toxicity, but the substance is sensitising with a risk of later allergic reactions. There is also a risk of later injury since the substance collects in the thyroid

gland and can give disturbances in its function. The substance is further considered to entail a risk of genetic change and a risk of tumor formation in, among other places, the liver and the thyroid gland.

Dioxins (Seveso)

In Seveso, Italy, there was in 1976 an uncontrolled release from a factory. A mixture of trichiorophenol, sodium hydroxide and tetrachloride bensodioxin was dispersed over an area of approximately 4-5 km. No immediate injuries were noted in people or animals but after two to four days, small animals such as birds, chickens and rabbits died. After three to seven days chemical burn injuries were noted in children who had been playing outside in the effected areas. After two weeks to two months, persons exposed to the gas cloud suffered skin changes, termed chlorine acne, and slight effects on the liver. This accident shows that it may be some days to weeks after exposure to a toxic substance before symptoms develop.

Phenol

A tank truck accident that occurred in Denmark in 1972 illustrates how an accident of this kind can have significant consequences for the environment, and the importance of the rescue personnel using adequate protective equipment. A tank lorry containing phenol got lost during transport from West Germany to a place in Denmark. On a narrow road it had taken by mistake, the lorry overturned in a sharp bend and phenol ran out. The accident occurred near the local source of water and a small lake which empties into the North Sea. Twenty persons were injured by the phenol. Apart from the driver, most were members of the rescue services team. The driver sustained serious injuries. The rescue team were exposed to the phenol because they initially were not using adequate protective equipment. Eighty km down the river, 60 tons of sea trout died in a fishery. Four hundred metres of fresh water conduits and drainage conduits had to be replaced and 1200 m of contaminated soil had to be removed.

Chlorine

As early as 1944 there was a chlorine gas accident in New York. Forty- five-kilo chlorine gas tubes were being transported on a lorry. One tube developed a leak. For seventeen minutes chlorine gas leaked out through a hole of approximately 3.2 mm. The lorry was parked only half a metre from the fresh air intake to a subway station. The chlorine gas attained sufficiently high concentrations in the subway station to affect a large number of people. A total of 418 people went to hospital and 208 were admitted for treatment or observation. There was no case of death. In one of the hospitals 133 were admitted and of these 33 required hospital care for one or more weeks. Because of the unfortunate circumstance that the leakage of chlorine gas was immediately adjacent to the fresh air intake to a subway station, the relatively moderate leakage came to have serious and far-reaching consequences.

The accident in Mississauga in Canada in 1979 is an example of an accident that had very limited effects concerning human injury. A train carrying chlorine gas tanks, among other things, derailed and caught fire. Only eight persons were injured, but 250,000 persons were evacuated from their homes for two to five days and a hospital with 1,250 patients was evacuated.

In August 1993 there was a release of chlorine gas at the Vanadisbadet (Vanadis outdoor swimming pool) in Stockholm. Sodium hypochlorite is used for purifying the swimming bath water. When refilling the tank with sodium hypochlorite the driver who was delivering the chemical filled it with phosphoric acid by mistake, instead of hypochlorite, whereupon chlorine gas was formed. He realised his mistake and stopped filling. Some 5 m^3 (approximately fourteen kilos) of chlorine gas was formed. Large sections of the area had to be cordoned off and 14 fire service units participated in the rescue work. In all, 13 persons were taken to hospital, however none with serious symptoms.

Sixty people in Gävle, Sweden, were exposed to chlorine gas in April 1998 and had to be taken to hospital. At a chemicals plant hydrochloric acid leaked out from a container. This was collected in empty containers, but by mistake one container that had contained sodium hypochiorite was used, whereupon chlorine gas was formed. The chlorine gas cloud was carried by the wind and 75m from the site a number of persons at a telemarketing company were exposed. All sustained imme-

diate trouble in the form of irritation, coughing and running eyes. Following treatment all could leave the hospital after a few hours.

Methylisocyanate (Bhopal)

In December 1984 the worst accident ever at a chemicals factory occurred. In an uncontrolled release at the Union Carbide factory in Bhopal, India, methylisocyanate flowed out and spread over a large area. Adjacent to the factory there were some of large slum areas, where thou sands of people lived. Light wind from 'the wrong' direction and an in-version layer (warm air preventing gases from rising) caused relatively high concentrations of this very reactive irritant gas to be dispersed over these slum areas. More than 2,500 people died in the first week after the accident and approximately 500,000 persons were exposed to the gas. Several thousand people died during the years following the accident in consequence of the lung injuries inflicted upon them. In addition, a large number of persons with cataracts have been registered and this is probably a delayed effect of exposure to methylisocyanate.

Nerve gases

In a terrorist attack in March 1995 on the underground railway system in Tokyo a large number of persons were injured. The nerve gas sarin had been placed in containers at one of the central underground stations in five carriages on three of Tokyo's nine underground railway lines. In total, injured persons were found at fifteen stations. Approximately 5,500 persons visited one of Tokyo's many hospitals, and 700 were admitted. Apart from the ten who died almost immediately, 17 were seriously poisoned. Two of these seriously poisoned persons later died in consequence of the hypoxic brain damage they sustained during the acute phase. The others recovered apparently entirely following treatment with the antidotes atropine and the oxime pralidoxime. The symptoms displayed by the injured were those that are compatible with nerve gas poisoning, i.e. cholinergic symptoms. To the hospital that admitted most patients, there came 640 of whom 111 were admitted, six to the intensive care unit and the others to normal wards or in assembly rooms and corridors. Some 30 police personnel and 139 ambulance per-

sonnel were ex posed to the gas during the rescue work and 43 needed hospital care. Several nurses and doctors also sustained symptoms of which, however, most were slight, while they were caring for patients that arrived at the hospital undecontaminated.

Nitrogen oxides

In an accident in January 1998 in Ostersund, Sweden, a large number of young people were exposed to nitrogen oxides when they were taking part in an ice hockey tour. A diesel-driven refrigeration plant was used for making ice in an indoor skating rink. The ventilation in the rink was shut off. The exhaust fumes from this type of refrigeration plant contain nitrogen oxides and when the ventilation is not working these gases collect above the ice. In all 187 young people visited the hospital between 10.30 pm and 1.00 o'clock am. Sixty-two of them had such pronounced symptoms from the respiratory tract that they needed treatment and hospital care.

In a rail accident in March 1998 two goods trains collided in the marshalling yard in Borlänge. Three trucks overturned and concentrated hydrochloric acid and ammonium nitrate leaked out, whereupon nitrogen oxides were formed. Four persons were slightly injured when they in haled the gas. Local residents were urged to stay indoors, but neither dwellings nor industrial premises needed to be evacuated.

Smoke shells

In August 1993 an accident occurred with a military smoke shell at a school in Uppsala (Sweden) with just over 1100 persons (pupils, teachers and other staff). Somebody had caused a military smoke shell to explode in a toilet at the school whereupon zinc chloride was released. Zinc chloride is an irritant gas that can involve risks of severe pulmonary effects. A total of 160 persons were taken to hospital for examination, observation and treatment. None suffered serious symptoms since the school was rapidly evacuated, thus avoiding serious exposure to the fumes. Following detonation of a smoke shell in a room with a volume of 850m where the smoke is distributed equally, a concentration of 0.5 g/m is attained. This means that the limit for fatal injury is exceeded if the exposure time is thirty minutes. For shorter times the risks

diminish but it can be assumed that serious injuries occur within some minutes.

NEW THREATS

Terorrism

Not all accidents can be prevented, however, and this applies especially to events in which chemical substances may be used for purposes of sabotage.

Terrorism using chemical weapons on any large scale has so far occurred on two occasions (Matsumoto and Tokyo). Failed attempts have been made on twelve occasions, possession has been discovered on nine occasions and failed use twice. Use of smoke shells in schools, discotheques etc occurs all over the world.

Chemical weapons can be produced with relatively simple chemicals technology which is becoming more and more widely known. Chemicals and equipment for manufacture are readily accessible. For this reason we cannot exclude an increased use of such substances in connection with terrorism - and we should therefore review our preparedness for such situations.

Terrorist operations with chemical substances which may have devastating consequences cannot be ruled out. Given that chemical weapons have been used once there, presumably no longer exist the same inhibitions about using them again. This must be taken into account in peacetime preparedness for disaster.

Dumping

A growing problem is the chemicals and chemical weapons, chiefly mustard gas, dumped in the sea. Following the second World War there was extensive dumping of chemical weapons in both the Baltic and the Kattegatt, both of mustard gas and nerve gases. Fishermen fishing in the area around the dumping sites have caught up ammunition containing mustard gas or pure mustard gas that has leaked from damaged containers, in their nets. This happens relatively often in the Baltic and has led to personnel injuries in some cases. The mustard gas that is brought up today is as active as it was fifty years ago.

There are no known cases in which nerve gas has been brought to the surface. It is thus impossible to say with any certainty what activity it retains, but if a nerve gas container were to break on board a fishing boat this would probably lead to poisoning.

Management of chemical disasters is often problematic because of the dramatic circumstances of such incidents, the lack of a co-ordinated planning and response, the problems about identification of the offending agents at the scene of the disaster, the paucity of data that exists on the vast majority of chemicals in regular commercial use, frequent exposure to multiple toxins and the immediate and continuous risk for rescue and emergency medical system personnel.

There is a general expectation among the public, responders and authorities that the medical and health profession is prepared to handle the health issues which occur in mass casualty situations. This is not the case when dealing with chemical exposures since they are rarely involved in preparedness activities and in response.

A review of major chemical disasters has shown that the medical management had been delayed or ineffective as a result of a failure to adequately characterise the hazard and the human health risks.

Medical treatment for chemical exposure is limited and largely supportive, with antidotes available for only a few substances. However, preventive action can limit the risk of further exposure to the public and rescuers, and may preclude or at least minimise the damaging effect, so this should therefore be stressed in all planning efforts.

NUCLEAR ACCIDENTS

Radioactivity, a major discovery of the 20th century, is unfortunately known mainly because of its military use. However, the everyday civilian use of radioactive materials is much greater: in the production of electricity, in industrial use, for plant biology and agronomy, and with applications in the medical field. These applications are just a few examples of the wide range of use in our daily environment. Due to the evolution of our civilisation and the consequent multiplication of civilian sources of utilisation of radioactive elements, the 'armed peace' and the *banalisation* of its use, the risk of incident or major disaster is every day greater, in spite of the preventive measures taken.

Therefore, a sound knowledge and thorough understanding of the objective causes, induced effects, and possible preventive and curative measures of radioactive phenomena are mandatory if the goal is to successfully inform the population at risk and, by so doing, limit panic or similar reactions or suspicion of secrecy.

The Chernobyl Nuclear Power Plant accident in 1986 is the most significant technogenic catastrophe, which has changed the mankind's attitude to the safety of nuclear industry, and caused special interest to the victims of this tragedy. Those most affected were the emergency workers during the first days of the accident, mainly firemen and staff members of the Chernobyl Nuclear Power Plant. Non-stochastic and stochastic effects are determining factors in the diseases and quality of life of survivors at the remote period.

MEDICAL CONSEQUENCES IN CONNECTION WITH THE OCCURRENCE OF A REACTOR ACCIDENT

A number of both large and small reactor accidents have occurred since the onset of the use of nuclear technology. Two of the accidents (Windscale and Chernobyl) involved dispersion of radioactive substances to the surroundings. Immediate deaths were also caused at two of the accidents (Idaho Falls and Chernobyl).

Windscale

A fire occurred in 1957 in the graphite that surrounded a British reactor for production of plutonium for making weapons. The fire was first discovered after one day. Some of the fuel elements had been destroyed. The reactor had no containment so some of the radioactive substances were released to the surroundings. Among other nuclides, radioactive iodine was released and contaminated the ground around the plant. The milk from that area was therefore contaminated. Radioactive iodine from the accident was found in a large part of central Europe, but in very small amounts.

Idaho Falls

An accident occurred in 1961 in a water-cooled reactor prototype when one of the operators, for an unknown reason, drew out a control bar. Water in the reactor "exploded", two operators in the reactor hall died immediately and a third operator died several hours later. The radiation in the hall was vary high, between 8000 - 10000 mSv.

Harrisburg

A reactor accident occurred in 1979 at the nuclear power plant Three Mile Island, which is located 15 km from the city of Harrisburg, Pennsylvania. The accident began when some of the water pumps stopped. Through manual manoeuvring errors and technical failure the reactor overheated and a large amount of the nuclear fuel was damaged. A large amount of radioactive material came out into the reactor's containment but release to the surroundings was small and contained almost totally noble gases. The highest individual dose is estimated at approximately 1 mSv. It has been estimated that the accident can lead to a few cancer incidents during the 50 years following the accident. Several reports have flourished regarding, among other things, deformed animals after the accident but none of the assertions have been demonstrated.

Chernobyl

A major accident occurred on 26 April 1986, at the nuclear power plant in Chernobyl. The power plant contained water-chilled graphite-moderated reactors. One of these reactors became "unstable" when an experiment was performed with the generator after turning off some of the safety systems. A strong rise in power in the reactor caused a violent power increase when the water that surrounds the reactor boiled to steam within a few seconds. The reactor exploded and began to burn.

Radioactive particles flew to approximately 1200 meters high. The larger particles fell to the ground near the plant. Noble gases, iodine, caesium and tellurium and the small particles of less volatile substances were carried with the wind, first north towards, among other places, Poland and Scandinavia, and later south over the Balkans and Greece. A three mile area around the nuclear plant was evacuated. A total of

100,000 people were evacuated. A total of 300 fire-fighters and nuclear power plant personnel were sent to the hospital. More than 200 of them had symptoms of acute radiation sickness. Two people died immediately in connection with the accident. Of the radiation and burn-damaged people, 28 died within three months.

The radiation doses that were received have been calculated according to the following:

Number sent to the hospital	Estimated radiation dose, Sv	Number of deaths
22	6 - 16	20
23	4 - 6	7
53	2 - 4	1
105	1 - 2	--

The town of Pripjat, which lies 5 km from the power plant and had 9,000 inhabitants, was evacuated quickly. The radiation dose to the inhabitants was therefore low, approximately 33 mSv. The over 50,000 people who were evacuated one day later received considerably higher radiation doses. Another group of nearly 25,000 people was evacuated a few days later from the area between 3 and 15 km from the power plant and received an average dose of 450 mSv. These doses give from statistical considerations around 500 - 600 cancer deaths during the 50 year period following the accident. This should be compared to 5000 sporadic cancer cases during the same period. The collective dose primarily from the fallout has been estimated at 6000 manSv. It is estimated that this will lead to 500 new cancer cases with 300 of them leading to death, also during the 50 years following the accident.

Thyroid cancer

The question of thyroid cancer in children has attracted much attention. The concentration of radioactive iodine in the thyroid gland has been measured in nearly 300,000 people. However the measurement results are of varying quality. A dose reconstruction has been done primarily for children, and radiation doses up to 40 Gy to the thyroid gland

have been estimated. Based on confirmed data up to 1994, there are 565 thyroid cancer cases in children who were under 14 years old when the accident occurred. The number of cases has continued to increase and according to preliminary information it was around 700 at the end of 1995.

This means that the number of cases of thyroid gland cancer per million children and year has increased in Byelorussia from 1 to 36, comparing the year after Chernobyl accident to the year 1994. In the Byelorussian region of Gomel the increase factor is 100. The increase in Ukraine is from 0.5 cases per million before the accident to 3.9 cases per million in 1992. The largest number of cases in the Ukraine is in the north of the country.

OTHER ACCIDENTS WITH RADIOACTIVE SUBSTANCES

Goiania, Brazil

Two scrap merchants stole a radiation reference source designed for medical radiation treatment on 13 September 1987. The source had been left in an old hospital building after the hospital had moved to new premises. The source contained 51 TBq (1375 Ci) of caesium-137 in a capsule. The apparatus was dismantled by the thieves 3 days later. The metal case was sold as scrap. The capsule with the caesium powder, which gave off a blue light, was opened and distributed to relatives and friends. The powder was smeared on the skin by several of the people, which gave serious burns. Some of the powder was swallowed through food that was contaminated by the hands. A total of 249 people was contaminated. By the end of September the medical care personnel began to suspect radiation damage because the scrap merchant's wife had suspected a connection between the capsule and the symptoms of sickness in their relatives. A total of 55% of the total amount of distributed caesium was found. Four people died; among them the scrap merchant's wife.

Chelyabinsk/Kystym/Techa-river

A development plant for separation of plutonium was started in 1948 100 km north-west of Chelyabinsk in the southern Ural (which was then a part of the Soviet Union). That city was called Chelyabinsk 65 and the plant was called Mayak. From the middle of 1949 until 1956, 76 million m^3 of radioactive waste were released into the river Techa. The waste contained an activity of 10^{17} Bq and a total of 124,000 individuals along the river was exposed to external and internal radiation.

On 27 September 1957, in Chelyabinsk 65, one of the tanks containing radioactive waste exploded and, because the town was secret, the accident was named after an adjacent town, Kystym. A total activity of 7.4 x 10^{17} Bq was released, 90% of it in the close surroundings. The other 10% was distributed with the wind to the north north-east direction, to what is now called the East Urals Radiation Trace (EURT). A total of 270,000 individuals was exposed.

After a long dry period in 1967 and a storm over the Karachay lake, an open reservoir for radioactive waste, 41000 individuals in the area near Chelyabinsk 65 were exposed. The approximately 5000 individuals who lived nearest to the reservoir received an averaged external dose of 13 mSv.

Several studies of the exposed individuals are currently in progress, for example, workers at the Mayak plant, workers who participated in the evacuation and cleaning after the accident, and the exposed inhabitants along the EURT and the Techa river. There is very little published material on the cancer risks in the different groups but intensive work is in progress. A study of 29,000 individuals along the Techa river shows an increased risk for different types of leukaemia and solid tumours, with a clear dose-response correlation that indicates that the ionising radiation has influenced the cancer risk.

COMMUNICABLE DISEASES

Disaster situations are often associated with the idea of communicable diseases; the media cannot speak of an earthquake without mentioning the risk of an epidemic outbreak or showing pictures of medical teams immunising victims. To put the issue into a proper perspective, it

may be helpful to list the main communicable diseases and to examine the factors that make them potentially dangerous in disaster.

The main communicable diseases

Tropical-medicine textbooks tend to classify communicable diseases according to the pathogenic agents that cause them (virus, bacterium, or parasite). In emergency situations, however, these diseases are customarily classified according to the way they are transmitted - which may, in some cases, be complex, involving several different mechanisms:

Diseases transmitted by contact
scabies trachoma conjunctivitis mycosis

Sexually transmitted
gonorrhoea
syphilis
AIDS

Vector-transmitted diseases
malaria
recurrent fevers trypanosomiasis yellow fever onchocerciasis schistosomiasis

Diseases transmitted through faecal matter
non-specific diarrhoeal diseases
cholera
amoebiasis and giardiasis bacillary dysentery
hepatitis
typhoid fever
ascariasis
ancylostomiasis (hookworm disease)

Diseases transmitted through the air
acute respiratory infection
tuberculosis
measles

meningitis
whooping cough

Experience has shown that, in emergencies, certain communicable diseases have a particularly great impact, as witness the mortality rates recorded among refugees in Thailand, Somalia, Sudan, and Malawi, where 50-90% of deaths were attributed to measles, diarrhoeal diseases, and acute respiratory infections. Other important communicable diseases include meningitis, cholera, and typhus. Sometimes a refugee population contributes to an increased risk for a particular communicable disease in an environment which was previously free from it.

Factors influencing the impact of communicable diseases in emergencies

Presence of a new pathogenic agent

Population migration may introduce pathogenic agents into host region. Usually it is not a new pathogenic agent in the strict sense, but rather a different strain from the one normally found in that particular environment.

The primary victims of this phenomenon are the displaced people themselves (although they may have a certain degree of immunity), but the local population may also be affected, being usually much more sensitive to a new pathogenic agent. Conversely, by changing environment, a displaced population may be confronted by a new pathogenic agent against which it has no immunity (for instance, malaria).

Susceptibility of the population

A population's susceptibility to disease is reflected at two levels: the population's immunity and the individual's immunity.

A population's resistance to a particular pathogenic agent depends on numerous factors, including the endemicity of the disease, and this is unequally distributed among members of the population. In the case of malaria, for example, the mortality rate in endemic regions is very high during the first two years of life. In groups from non-endemic areas who move into endemic regions, all individuals run the risk of developing severe forms of malaria. Any change in the make-up of the population, such as a relative rise in the percentage of children, proportionally increases the number of people sensitive to infectious agents. Malnour-

ished children are particularly susceptible to infections.

It is impossible to determine the immunity of each individual in a population, but the groups at risk - those who are naturally most vulnerable to specific pathogenic agents - can be defined. The importance of this is evident when target populations must be identified for specific forms of intervention.

Increased transmission

The epidemics that develop in disaster situations are essentially a function of the large concentrations of displaced people or refugees living together in camps where living conditions are particularly hazardous. Natural disasters that do not entail mass population movements do not increase the risk of epidemics[2]. Several factors contribute to an increase in disease transmission, particularly: overcrowding; and deterioration of hygienic conditions like lack of water for basic hygiene.

Deterioration of the health services

The deterioration or breakdown of the health services affects disease transmission at all levels. For example, no vaccinations are given or vector-control programs deteriorate. Thus, not only do the risks increase in an emergency situation but, in addition, the means of disease control are usually inadequate, if not non-existent. All these factors contribute to an increased incidence of communicable diseases, as well as to a greater severity of clinical manifestations, reflected in the mortality rates for specific infections.

EPILOGUE

Until recently there has been a general tendency to consider that the basic needs of the affected populations or people had to be considered mainly in terms of physical injuries, material losses and immediate needs. That is the reason why the emphasis was put on providing curative care, food, shelter or immunization. Psychological needs of individuals - and psychosocial needs of affected communities - were considered by too many agencies (whether governmental or non-governmental) as accessory and secondary.

The current ubiquitous presence of the media, with their tendency to focus primarily on what they regard as the more sensational aspect of events, does not facilitate the understanding of the complex reality of disasters. Witnessing disasters through the eye of the television camera gives little insight into the psychological suffering or the central experience of loss that most of the victims have to go through. In many circumstances, the media give us a wrong idea of the real dimension of the social and emotional suffering of human beings when, for instance, they are refugees in camps. The worst scars in disasters are the psychological and social scars: some of them can even be transgenerational.

The loss experience is something complex and it is much more than just the superficial aspect reported by the media. Indeed, survival is more than just not dying. The central problem is the quality of life. The victims (survivors, bereaved family, witnesses, or whoever) have to process their feelings in order to transform them so that they can live with them in some sort of equanimity, and in doing so they must transform their experience of the event. The future is largely determined by the ability of the victim to process feelings in order to give a meaning to the events.

It is generally accepted nowadays that mental health is a priority in any disaster, whether at the individual level or at the community level, for it will determine the long-term outcome. It is no longer possible to improvise in this growing field: mental health must be part of any disaster plan. The need for cooperation, coordination and optimal use of limited resources calls strongly for the presence of skilled helpers, specialised organisational help and well planned programmes. It is not sufficient to have a good knowledge of the main component of the plans and related strategies necessary to ensure a successful rescue operation. The rescuers involved in the prehospital as well as in the hospital phase of the rescue chain (firefighters, medical staff, and all primary aid personnel) should have some meaningful understanding of the social and psychological needs of victims and affected people in the immediate aftermath of the event as well as in the longer term.

REFERENCES

1. Alexander M. Butman. Responding to the mass casualty incident: a guide for EMS personnel. ETI, 1982.
2. Boer J de, Brismar B, Eldar R, Rutherford WH. The medical severity index of disasters. J Emergency Med. 1989; 7:269-273.
3. Boer J de, Dubouloz M. Handbook of Disaster Medicine. Emergency medicine in mass casualty situations. Van der Wees, Amsterdam, 2000.
4. Boer J de, Rutherford WH. Definition and classification of disasters. Introduction of a disaster severity scale. J Emergency Med. 1990;8:602-608.
5. Boer J de. Tools for evaluating disasters. J Emergency Med. 1997;4:107-110.
6. *Care of Casualties in Chemical Accidents,* and *Protection against Infection.* General Advice from the National Board of Health and Welfare, 1990:10 and 1990:9. Stockholm, 1990.
7. *Care of Casualties in Chemical Accidents,* General Advice from the National Board of Health and Welfare, 1990:10. Stockholm, 1990.
8. *Care of the Injured in Radiation Accidents and Nuclear Weapon Explosions,* General Advice from the National Board of Health and Welfare 1991:5. Stockholm, 1990.
9. *Chemical Accidents and Disasters. Medical care. Planning guidance.* The National Board of Health and Welfare. Stockholm, 2000.
10. *Chemical Protection in Medical care. Decontamination and treatment in Peacetime, Crisis and War.* The National Board of Health and Welfare. Stockholm, 1996.
11. Committee on Challenges of Modern Society. Health and medical response preparedness for chemical releases. Report N° 198: Disaster Preparedness Plans Responding to Chemical Accidents (Health and Medical Aspects), Committee on the Challenges of Modern Society, NATO, 1997;11
12. Diagnosis and treatment of radiation injuries. Safety reports series No.2. International Atomic Energy Agency. Viena, 1998.
13. *Dinesh C Sharma.* Bhopal's health disaster continues to unfold. Lancet, Vol. 360: 859.
14. Dubouloz M. Guidelines for Medical Experts in International Commissions in Case of Allegation of Violation of International Hu-

manitarian Law. Proceedings of the International Society of Disaster Medicine 1993.
15. Erik Auf der Heide. Disaster response: principles of preparation and coordination. Mosby, 1989.
16. Health surveillance of persons occupationally exposed to ionizing radiation: guidance for occupational physicians. Safety reports series No.5. International Atomic Energy Agency. Viena, 1998.
17. International Federation of Red Cross and Red Crescent Societies. World Disaster Report. Focus on public health. Geneva, 2000.
18. M.Masellis, S.W.A. Gunn. Mass burn casualties and fire disasters. Kluwer Academic Publishers, 1992.
19. *Medical Preparedness fo Disasters*. The National Board of Health and Welfare. Stockholm, 1993.
20. Noji EK. The Public Health Consequences of Disasters. Oxford 1997.
21. Planning the medical response to radiological accidents. Safety reports series No.4. International Atomic Energy Agency. Viena, 1998.
22. Psychological, psyciatric and social management of disaster. General guidelines. General Advice from the National Board of Health and Welfare, 1991:2.
23. Rutherford WH, Boer J de. The definition and classification of disasters. Injury 1983;15:1-12.
24. Suzuki T, et al. Sarin poisoning in Tokyo subway. Lancet, 1995;345:980.
25. Volodymyr G. Bebeshko, Alexander N. Kovalenko, David A. Belyi, Dimitry A. Bazyka, Anatoliy A. Chumak, Victor A. Sushko, Vasyl M. Gayiday. Medical monitoring results of survivors with acute radiation syndrome after Chernobyl disaster. International Congress Series 1258 (2003) 115– 122.
26. World Health Organization, Division of mental health: Mental Health of Refugees 1996.
27. World Health Organization, Division of mental health: Psychological Consequences of Disasters: Prevention and management 1992.
28. World Health Organization: Vulnerability Reduction 1997.

DEATHS AMONG THE DRUG USERS IN KLAIPEDA REGION IN 1993 – 2002

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INTRODUCTION

After regaining of independence, Lithuania, as well as other Central and Eastern European countries, became open for European and world-wide market, also for the market of illegal narcotic substances. Due to its benevolent geographical situation, Lithuania became a transit country [10]. During the decade, the number of drug addicts increased more than seven times, i.e. from 13.2 cases in 1990 up to 95,3 cases in 2000 for 100 thousand of population [26]. In 2003, even more sick with drug and toxic abuse were registered - 126,3 cases for 100 thousand of population [26]. The highest number of drug addicts is in Vilnius County - 100.000 of population get 167 cases, second place is for Klaipeda county - 129,3 cases for 100.000 population [26].

The number of illegal drug addicts is increasing, arousing the society's consent, because nobody can forecast the chemical composition of illegal drug substances [24]. Drug demand and supply especially increased during the last five years, during this period, heroin, synthetic drugs, prevailed in illegal turnover.

What worries the most is that the big part of drug addicts intravenously takes opiates, most often heroin. Younger and younger people try narcotic substances, drug abuse prevails among students. Last year, the whole country was shocked by HIV infection prevalence in the prisons of Lithuania. Neighborhood with Kaliningrad region and Byelorussia

brings threat that drug abuse and HIV will spread even more. Experts assert that during the coming years the number of drug addicts and death cases related to drug overdose will increase [24].

However, official drug usage statistics in Lithuania does not reveal the real situation in the country.

It is very difficult to evaluate the real drug usage scale in Lithuania because of the lack of systematic sociological and epidemiological research, covering inhabitants of different age and social status, there is no monitoring system created.

Following the data of the experts, today there are around 20 thousand of people taking drugs in Lithuania. However, currently we can talk about the scale of drug abuse, presenting just approximate numbers. Evaluating the problem of drug abuse all over the world, first of all the attention is paid to the dynamics of death-rate of drug addicts by overdosing. In Lithuania, the drug abuse revealed itself with all its conclusions, i.e. an increase in the number of young people mortality by overdosing, prevalence of HIV/AIDS, increase in the number of crimes, etc.

A complicated situation appears in the western part of Lithuania. Following the statistical data of 2002, in Klaipeda city, the number of being sick with the dependency on narcotic-psychotropic substances for 100.000 inhabitants was 282,2 and exceeded the average of the republic by more than two times [26]. Klaipeda city, in terms of the number of the drug addicts, is in the third place after Visaginas and Vilnius [26]. Following the statistics of Lithuania AIDS Center, the prevalence of HIV infection in Klaipeda is the highest from other Lithuanian towns. Following the data of January 2nd, 2003, there are 184 HIV infection cases determined in Klaipeda, meanwhile in Vilnius – 120, and Kaunas only 17 [16].

Due to benevolent conditions for the spread of drug abuse, in 1999, fulfilling PHARE program, the investigation was supposed to be carried out in Klaipeda secondary upper schools. The investigation results showed that the usage of illegal drugs is significantly higher – i. e. 23,9% compared to the average of the country – 15,5% [6].

Kaliningrad region, along with its unsolvable drug abuse as well as HIV/AIDS problems, has a negative influence on Klaipeda drug abuse situation.

In 2002, Klaipeda dependency diseases center registered 560 people, being sick with the dependency on narcotic-psychotropic substances

[13]. In 1997 – 2002, 43 death cases of drug addicts were registered in Klaipeda [13].

However, it is just an official data, according to the specialists, there are no less than 4000 people taking different narcotic substances in Klaipeda.

WORK OBJECTIVES (AIM)

❖ To determine the reasons of deaths of the persons, using narcotic-psychotropic substances, in Klaipeda region in 1993-2002.

MATERIAL AND METHODS

The work objective group was formed out of the persons, the reasons of deaths of whom were directly or indirectly related with the usage of narcotic and psychotropic substances in Klaipeda region in 1993 – 2002.

Drug addicts are the people who, according to the forensic medicine expertise act, were using substances, belonging to the UN general convention list No. 1. of 1961, „Regarding the narcotic substances", and the UN convention control list No. 1. of 1971, „Regarding the psychotropic substances". Data on the deaths of drug addicts is based on the information, provided by police officers, relatives, friends, doctors, evidence, found at the body (syringes and narcotic substances), the results of autopsy and toxicological research.

142 drug addicts, who died in Klaipeda, Kretinga, Palanga, Nida, Silute, Taurage, Telsiai, Plunge, formed the work objective group and are being analyzed in the study. The inhabitants of Klaipeda city comprised 86,6% of all being investigated, – Klaipeda region - 1,4%, and 12% inhabitants of other towns. Following the possessed data, the ones who lived in the city were 97,9% and 2,1% – in the village, from 11 up to 57 years of age.

Narcotic and psychotropic substances were determined by researching biological fluids (most often urine) and tissues following the methodic, recommended by United Nations, the method of thin layer chromatography. Biological samples were investigated in toxicology lab of Klaipeda expertise department of Forensic medicine institute.

For the statistical processing of data and comparative analysis, the following software was used: statistical packages SPSS, S – PLUS, and STATISTICA, as well as mathematical calculator Microsoft Excel.

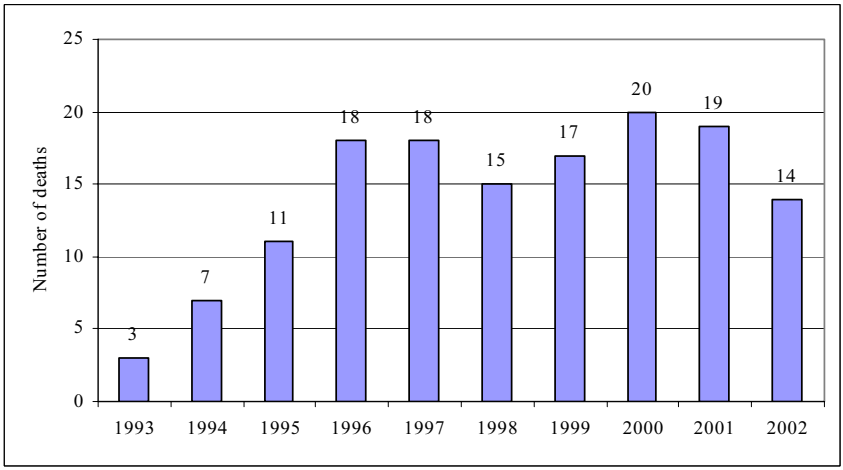
Working on the statistical part, graphic data analysis was made, frequency tables drawn (relative frequencies are shown in percentage), correlation coefficients calculated, as well as hypothesis checked, based on *chi kvadrat* and *t* criteria. Probability value p was presented to show the significance of the test. Checking hypothesis, 5% significance level was used.

RESULTS

During the period of 1993 – 2002, there were 142 deaths of drug users determined in Klaipeda region. Most of them occurred in 2000 – 20 deaths of drug addicts.

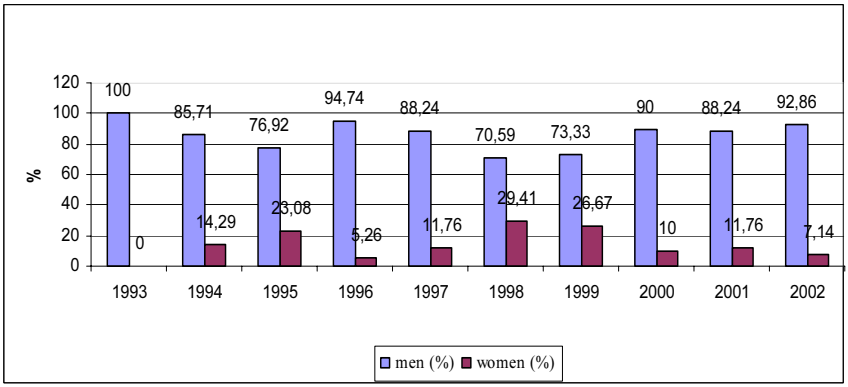
In Klaipeda region, the number of deaths, related to the usage of narcotic substances, during 1993 – 1996, and 1997 – 2002, statistically significantly increased (applied t criteria: t = -2,6572; p = 0,0289).

Figure 1. Drug related death cases during 1993-2002 in Klaipėda region



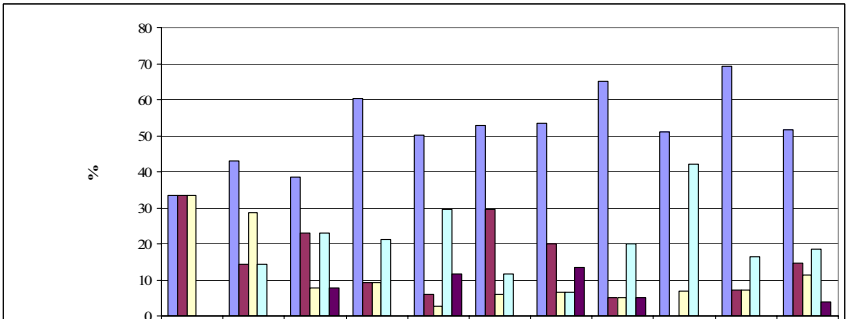
During the investigation period, the male deaths comprised 86,1% and female – 13,9%. The most female death cases among the drug users were in 1998 – comprised 29,4% (Figure 2).

Figure 2. Drug related deaths among men and women during 1993-2002 in Klaipeda region



During the investigation period, the most common death reason among the drug addicts was poisonings (overdose) of narcotic substances - 51,7%. Out of 142 dead, who took narcotic substances, violent deaths in average comprised - 18,5%, deaths related to infection complications - 14,7%, deaths related to somatic diseases - 11,3%, and among the drug users non-violent deaths comprised 3,8%.

Figure 3. Causes of drug related deaths in Klaipeda region



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
Acute poisoning	33,33	42,86	38,46	60,42	50,29	52,94	53,33	65	51,18	69,29	51,7
Infection complications	33,33	14,29	23,08	9,26	5,88	29,41	20	5	0	7,14	14,7
Somatic diseases	33,33	28,57	7,69	9,26	2,65	5,88	6,67	5	6,76	7,14	11,3
Violent deaths	0	14,29	23,08	21,05	29,41	11,76	6,67	20	42,06	16,43	18,5
Non - violent deaths	0	0	7,69	0	11,76	0	13,33	5	0	0	3,8

During the investigation period, among the dead drug addicts, most common substances found narcotic–psychotropic and their combinations:

1) Opiates – benzodiazepines in average comprised 25,5% of all poisonings (Figure 4).

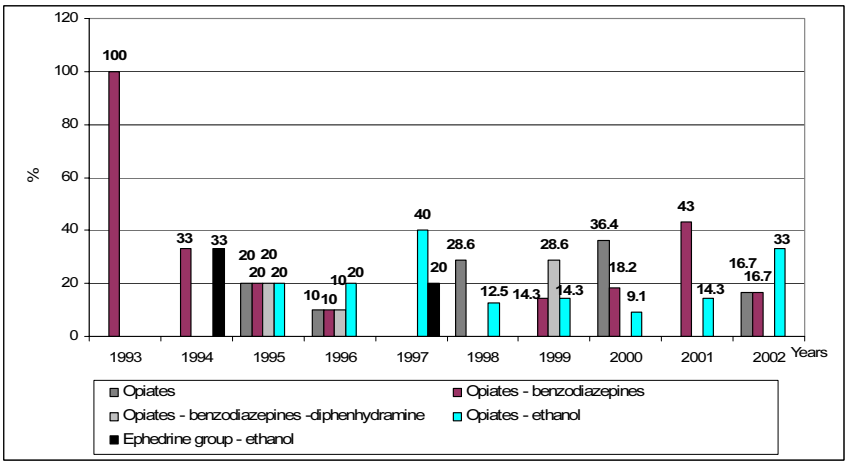
2) Opiates – ethanol comprised 16,4%.

3) Opiates – 10,8%.

4) Opiates – benzodiazepines – diphenhydramine comprised 5,9%.

5) Ephedrine group - ethanol 3,2%.

Figure 4. Fatal poisonings with separate drug groups



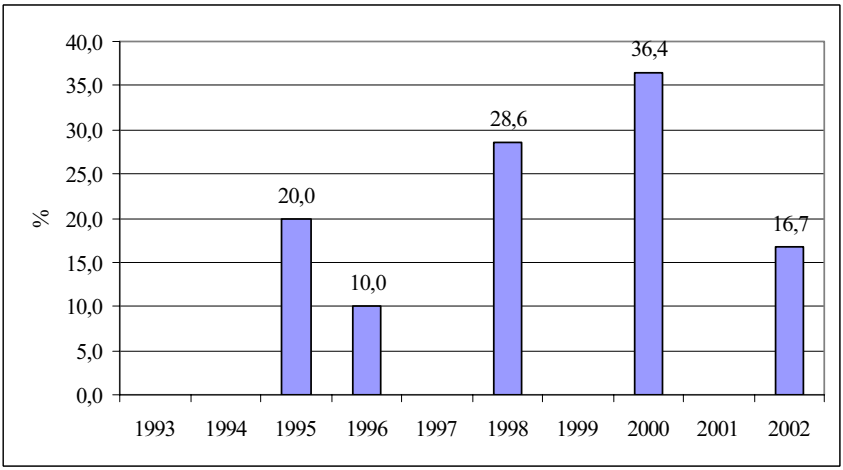
The number of deaths related to poisoning with opiates along with other narcotic-psychotropic substances in 1993 – 1998 and 1999 – 2002 statistically did not differ ($t = 1,5313$; $p = 0,1303$). Poisonings with opiates and other narcotic–psychotropic substances were distributed evenly during all investigation years. In average during the investigation period, poisonings with opiates and combined poisonings with opiates and narcotic–psychotropic substances were 72,1%.

The number of deaths related to the poisonings with opiates–benzodiazepine group substances in 1993 – 1998 and 1999 – 2002 statistically did not differ ($t = 1,5936$; $p = 0,1157$). The number of deaths related to the poisoning with opiates–ethanol in 1993 – 1998 and 1999 –

2002 statistically did not differ (t = -0,305; p = 0,7614). Poisonings with opiates–benzodiazepines and opiates-ethanol were distributed evenly during the investigation period.

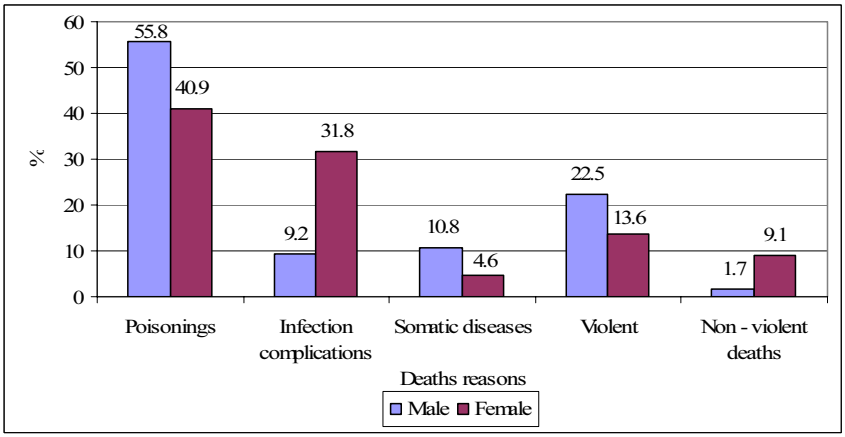
The number of deaths related to the poisoning with narcotic substances of opiate group (without other substances) in 1993 – 1998 and 1999 – 2002 statistically differed (t = 2,0174; p = 0,0475). The number of deaths related to poisoning with opiates increased during the last 4 years of investigation period. The highest number of poisonings with opiates without other substances during the investigation period was determined in 2000 – 36,4% of all the poisonings that occurred that year (Figure 5).

Figure 5. Fatal poisonings with opiates



Poisonings (overdose) dominate among the reasons of male and female deaths. Deaths, related to infection complications, and non-violent deaths were more common death reasons among women than men. However, deaths, related to somatic diseases and violence, were more common among men than women. Statistical distribution of death reasons among men and women differs statistically significantly (applied χ^2 criteria: $\chi^2 = 13{,}374$; p = 0,01).

Figure 6. Distribution of death causes by gender during 1993-2002 in Klaipeda region



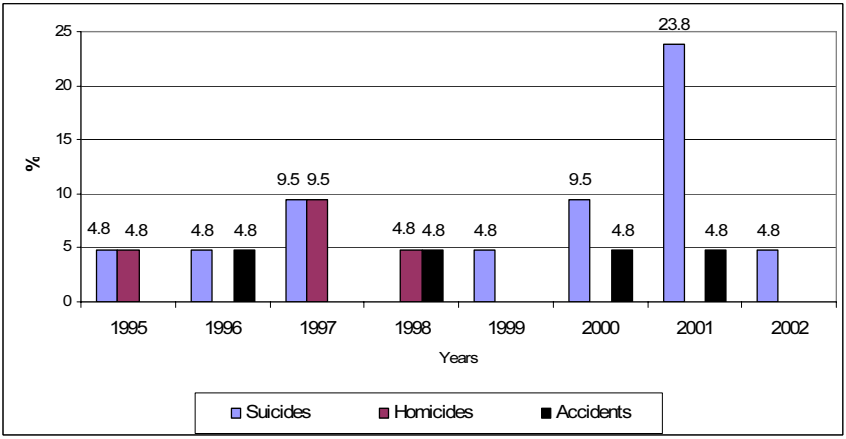
Out of all violent deaths, determined during the investigation period, suicides were the most common, which in average comprised 66,7% of all violent deaths (not including the suicides by poisoning) (Figure 7). Hanging dominated among the drug addicts - comprised 73,3% of all suicidal cases, which in average occurred during the investigation period. Other suicidal cases, in relation to intoxication comprised 26,7%. The number of suicides during the first 5 years and last 5 years statistically significantly did not differ ($t = -1,40$; $p > 0,05$).

Homicides in average comprised 19,1%, while accidents correspondingly – 14,3%.

Distribution among dead drug addicts according to the age shows that the most death cases among the drug users of Klaipeda region occurred in the groups of 26 – 30 years of age – this comprised 25,8% of all death cases during the investigation period and in the group of 21 – 25 years of age, this correspondingly comprised 20,8%. Since 1998, the number of deaths increased in the age group of up to 20 years of age – in 1998, comprised 17,7% of all the death cases that occurred that year, while in 2000, comprised 29,4% of all death cases. Since 1999, the number of death cases increased in the age group of 21 – 25 – in 1999, there were 26,7%, in 2000– 35%, while in 2002, even 50%. Also, the

decrease in death cases in the age group of 35 – 40 was determined, especially since 1999, when determined 13,3% up till 2002, when determined 4,1% of all the death cases that occurred that year. During the last 4 years of investigation period, a significant decrease in death cases was determined in the age group of over 40 years of age – in 1993, there were 33,3%, in 2001– 5,9%, while in 2002, there were none (Figure 8).

Figure 7. Violent death cases, related to drug taking



Applying χ^2 criteria, the number of death cases in different age groups was compared in the beginning and the end of investigation period. The number of death cases in the age group of up to 20 years of age in 1996 and 2002 statistically significantly increased ($\chi^2 = 4,71$; p = 0,03).

The number of death cases in the age group of 21 – 25 years of age in 1994 – 2002 statistically significantly increased ($\chi^2 = 29,78$; p = 0,0000).

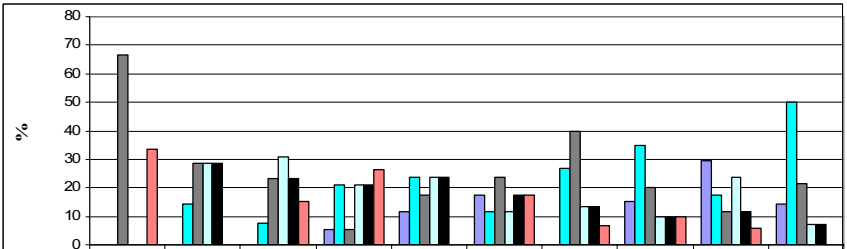
The number of death cases in the age group of 31 – 35 years of age in 1994 – 2002 statistically significantly decreased (χ^2=16,40; p = 0,0000).

In 2002, the number of death cases among the age groups of up to 20 years of age and 31 – 35 years of age, statistically significantly differs ($\chi^2 = 4,39$; p = 0,0361). Also, the number of death cases among the

age groups of 21 – 25 years of age and 31 – 35 years of age this year statistically significantly differs ($\chi^2 = 45{,}37$; $p = 0{,}0000$).

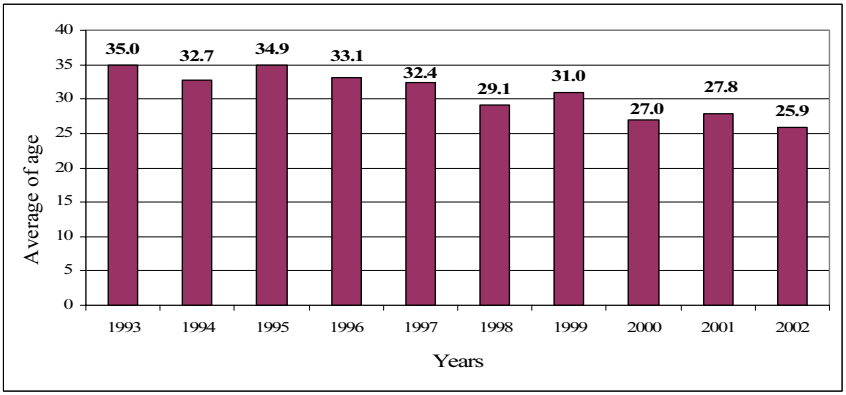
These statistical conclusions about the number of death cases among different age groups allow us to assert that during the investigation period the number of death cases among the older drug addicts statistically significantly decreased, meanwhile it increased among the younger ones.

Figure 8. Number of drug related deaths in certain age groups



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
up to 20	0	0	0	5,26	11,76	17,65	0	15	29,41	14,29
21-25	0	14,29	7,69	21,05	23,53	11,76	26,67	35	17,65	50
26-30	66,67	28,57	23,08	5,26	17,65	23,53	40	20	11,76	21,43
31-35	0	28,57	30,77	21,05	23,53	11,76	13,33	10	23,53	7,14
35-40	0	28,57	23,08	21,05	23,53	17,65	13,33	10	11,76	7,14
over 40	33,33	0	15,38	26,32	0	17,65	6,67	10	5,88	0

Figure 9. The average age of dead drug addicts



Statistical male and female age average statistically significantly does not differ ($t = -1,01$; $p > 0,05$). The average age of dead drug addicts in Klaipeda region during the investigation period was 30,2 years (Figure 9). Average male age was 30,5 years, and average female age - 28,6 years.

DISCUSSION OF RESULTS

Since 1996, in Klaipeda region, noticeable an increase in the number of death cases, most of the death cases during the investigation period, among the drug addicts in 2000 – 20 cases. In Latvia, during the period of 1991 – 1999, the number of death cases was increasing, related to the usage of narcotic–psychotropic substances, in 1993, there was determined 40,4% more dead than last year (47 death cases), and in 1999, 54% more than last year (115 death cases) [4]. In Slovakia, during the period of 1993 – 1998, the number of death cases was increasing, related to the usage of narcotic substances, especially since 1996, when 23 death cases of drug addicts were determined, this comprises 39,1% more than last year [17]. In Sweden, since 1996, was determined more death cases, related to the drug usage (in 1996 – 124 death cases) [1]. In Denmark, during the period of 1971- 2000, the highest number of death cases among the drug addicts was in 1994 – 1997, when 266 – 275 death cases were determined every year. In 2000, the number of death cases increased among the drug addicts by 3,2%, compared to the last year (in 1999 – 239 drug addicts died, meanwhile in 2000 – 247) [8]. In Copenhagen, an increase in the number of death cases was determined by 32% in 1994 and by 19,5% in 2000, compared to the last year [8].

Among the drug addicts of Klaipeda region, the most common reasons for death cases were the overdose of narcotic substances, which in average comprised 51,7% of all death reasons. During the investigation period, an increase in the number of fatal poisonings was determined – especially since 1996, when it was determined 60,4%, up till 2002 - 69,3%. In Klaipeda region, fatal poisonings with opiates and combined poisonings with opiates along with other narcotic–psychotropic substances comprised 72,1%.

In Germany (Köln), overdose comprised 65% of all death cases, related to the usage of narcotic substances [9]. In Eastern Denmark (and Copenhagen) in 1992 – 2000, the main reason for death of drug addicts

was poisonings with morphine/heroin, in average comprised 84% [15]. In Denmark in 2000, poisonings with opiates (heroin, morphine, codeine, and methadone) comprised 49%, meanwhile poisonings with opiates along with psychotropic substances – 20% of all poisonings [8]. In Latvia dead poisonings related to the drug usage in 1993 – 1997, comprised 61% – 69% [12]. In Finland, during the period of 1990 – 2000, poisonings comprised 64% of all death cases of drug addicts, out of them poisonings with opiates (among them with opiates along with other substances) comprised 72% [27, 30]. In Spain, during the period of 1993 – 2000, poisonings with heroin in average comprised 90,9% of all poisonings of drug addicts [3]. In Dublin (the Republic of Ireland) during the period of 12 months (1999 – 2000) out of all poisonings (57 death cases) 65% was poisonings with heroin, out of which 65% was combined poisonings with heroin along with other narcotic substances or alcohol [5].

In Istanbul in 1990 – 2000, out of all drug overdose cases, 97% is poisonings with heroin [25].

In Germany during the period of 1975 - 2000, the most common reason for drug addict's death was poisoning, out of them 26% with heroin, and poisoning with heroin and psychotropic substances comprised 23% [11]. In United Kingdom (London) during the period of 1974 – 1993 the most common reason for death - 64,3% incidental poisoning, out of them 75% with heroin/morphine or methadone [18]. In 1984 – 2000 in Italy (northern part of the country) out of 5190 drug addicts death cases by overdosing, 95,9% occurred due to poisoning with heroin, out of them 50% were combined poisoning (heroin along with benzodiazepines, canabiniodes, cocaine, methadone [19].

In Klaipeda region, the most common poisoning cases occurred due to opiates – benzodiazepine group substances, which comprised 25,5% of all poisonings, opiates–ethanol – 16,4%, and the ones who overdosed only opiate group substances, were 10,8%.

In Germany (Koln), poisoning with heroin dominated, 63% of all poisoning cases were combined poisoning, the most common substances found were: morphine, benzodiazepines, and ethyl alcohol [9]. In Denmark (Funen place) in 1995 –1996, out of all who overdosed with narcotic substances, absolute majority has overdosed with heroin, 50% of them along with heroin overdosed benzodiazepines, 28% cocaine, 13% amphetamine [23].

In Klaipeda region, the number of fatal poisoning only with opiates statistically significantly increased during the period of 1999 – 2002. The most common cases were poisoning only with opiate group substances. In 2000, it comprised 36,4% of all poisoning cases that year. Since 1999, investigating the tissues of the dead as well as syringe fluid remaining, found at the bodies, MAM was found (heroin split product). Here we can make the conclusion that in Klaipeda since 1999, there were determined death cases, related to heroin consumption. In Latvia, the main reason for drug addicts' death is poisoning with opiates, during the last years, the number of poisoning cases with heroin increased (In 1994, 4 people overdose with heroin, meanwhile in 2000– 63). In 2000, the most common poisoning of all lethal poisoning cases among people of 25 – 35 years of age was with heroin - 34,6% [28]. In Finland since 1996, the number of sudden death cases, related to heroin overdose, increased. In 1995, 1 case was determined, in 1996 – 9, meanwhile in 2000 – 62 death cases [30]. In Austria (Vienna) in 1994-1995, the number of death cases, related to opiate overdose, increased 3 times, in comparison to the previous years [21].

Death cases, related to the long - term toxic narcotic effect (somatic diseases) in Klaipeda region during the investigation period in average comprised 11,3%, where death cases, related to infection complications, which resulted from the usage of narcotic substances – 14,7%. In Latvia in 1993 – 1997, death cases, related to the long-term drug consumption (somatic and infection diseases, related to drug consumption in general) were determined 7,3% – 21,3% [12]. In Spain during the period of 1992 – 1997, 1064 drug addicts' death cases were determined, out of which 37,5% comprised dead from AIDS, 35,2% drug overdose, and 27,3% dead from other reasons. During the later years, the number of death cases, related to AIDS, was decreasing due to antiviral treatment [3]. In Klaipeda in 2001, there was one drug addict dead from AIDS (this is the one and only case in Klaipeda region during the period of 1988 – 2003) [29]. In Italy (northern east part) in 1985 –1998, the most common death cases among heroin users were in relation to poisoning - 37%, in relation to AIDS – 32,5%, car accidents – 9,4% [20].

In Klaipeda region during the investigation period, there was 18,5% of violent death cases, related to drug taking, determined. Out of them, 6,6% are suicides. In 2000 in Denmark, 2% are suicides (mainly self-hanging and self-drowning) [8]. In Latvia during the period of 1993 –

1997, there was 14,4% of such cases [12]. In Istanbul in 1990 – 2000, out of all death cases of drug addicts out of other reasons than overdose, injuries comprised 11,9%, self-hanging - 11,1% [7]. In Copenhagen in 1992 – 2000, injuries comprised 6% of all death cases, related to drugs [15].

During the investigation period, distribution of the dead according to the sex was: 86,1% - men, 13,9% - women. The highest number of female death cases was in 1998 - 29,4%. In Denmark during the period of 1980 – 2000, the number of male death cases increased from 72% up to 80% [8]. In Sweden – the registered number of female death cases was lower in 1997 and 1998 (around 16%), and during the period of 1987 – 1996, the number of female death cases in average were 20% [1]. In Istanbul (Turkey) out of all dead out of overdose in 1990 – 2000, 91,2% was men and 8,8% women [25]. In Italy (Rome) in 1980 – 97, after carrying out the mortality research among intravenous drug users, it was determined that 92% were men [2]. In United Kingdom in 1993 – 1998, out of all lethal poisoning with opiates, 78,7% were among men and 21,3% among women [22]. In Austria (Vienna) among the dead victims out of overdose with opiates in 1994 – 1995, 74,7% men and 25,3% women [21].

In Klaipeda, the average age of dead drug addicts was 30,2 years. In Dublin in 1999 – 2000, the average age of dead from poisoning with narcotic substances was 30,4 years [5]. In Istanbul in 1990 – 2000, the average age of dead from poisoning with narcotic substances was 33 years [25]. In Italy (Rome) in 1980 – 97, the average age of the dead intravenous drug users – 26,6 years [2]. In Denmark (Funen place) in 1995 –1996, the average age of the ones, who poisoned themselves with narcotic substances, - 34 years [23].

The average age of dead drug addicts of Klaipeda region during the investigation period decreased from 35 years of age in 1993 up to 25,7 years of age in 2002. In Denmark during the period of 1980 – 2000, the age of dead drug addicts increased from 31,5 years of age up to 37,8 years of age [8]. In Eastern Denmark in 1992 – 1999, the average age of dead drug addicts increased from 32 up to 36 years of age [14]. In Italy (northern east part) during the period 1985 –1998, the average age of dead heroin users increased from 26 up to 34 years of age [20].

CONCLUSIONS:

1. In Klaipeda region, the number of death cases, related to the usage of narcotic substances during 1993 – 1996 and 1997 – 2002 statistically significantly increased.

2. The most common reason for death of a drug addict was the overdose of narcotic-psychotropic substances, which comprised 51,7% of all death reasons.

3. The most common narcotic-psychotropic substance combinations, which caused poisonings: opiates–benzodiazepines (25,5%) and opiates-ethanol (16,4%) combinations.

4. Distribution of dead drug addicts according to the sex shows that absolute majority of them was men - 86,1%.

5. Distribution of dead drug addicts according to the age shows that the highest number of death cases was determined in the age groups of 26 – 30 years of age.

REFERENCES

1. Andersson B. National Report Sweden 2001. Stockholm, 2001, p. 64.
2. Bargagli A.M., Sperati A., Davoli M., Forastiere F., Perucci C.A. Mortality among problem drug users in Rome: an 18 – year follow – up study, 1980 – 97. Addiction 2001 Oct: 96 (10): 1455 – 63.
3. Brugal M. T. Mortality among drug users. Cohot studies on mortality. Conference „Recommendations and support for the drug related deaths indicator and estimated prevalence indicator“. May 29 – 30, 2003. Vilnius, 2003.
4. Caunitis J. National Report on the drugs situation in Latvia 2000. Riga, 2000, 79 p.
5. Daeid N. N., Cummings J., Cassidy M. An investigation into drug related deaths in Dublin, Republic of Ireland. Forensic Science International Vol. 136 Suppl. 1, 2003, p. 306.
6. Davidavičienė A.G. Alkoholio ir kitų narkotikų vartojimas Klaipėdos mokyklose. EB PHARE projektas „Narkomanijos prevencija bendruomenėje 1999 m.“ Klaipėda, 1999.

7. Ersoy G., Akgul E., Gunaydin U., Toprak S. Non – overdose drug – related deaths. Forensic Scie Inter Vol 136, Suppl. 1, 2003, p 311.
8. Grasaasen K., Philipsen H. H., Pedersen M. U., et al. Annual Report of the Drugs situation in Denmark 2001. Kopenhagen, 2001, p. 130.
9. Grass H., Behnsen S., Kimont H. – G., Staak M., Kaferstein H. Drug – related fatalities in Cologne 1989 – 2000 with special reference to methadone. Medicina Legalis Baltica, 2002 Nr. 13 p. 120 -127.
10. Grimalauskienė O. National Report on the Drugs Situation in Lithuania 2000. Vilnius, 2000, p. 113.
11. Institut fur Therapieforschung. Germany Drud Situation 2000. Reitox Ref 2000, p. 193.
12. Khodasevitch T., Volgram J. The investigations of drugs in biological fluids and post-mortem material in Latvia. Medicina Legalis Baltica, 1999, nr. 10, p. 185 – 189.
13. Klaipėdos priklausomybės ligų centro ataskaitos apie psichikos ir elgesio sutrikimus vartojant psichoaktyvias medžiagas 1997 – 2002 m.
14. Kringsholm B., Steentoft A. Deaths among drug addicts in East Denmark in 1992 – 1999. Medicina Legalis Baltica, 2002 Nr. 13, p. 145 – 148.
15. Kringsholm B., Steentoft A. Deaths among drug addicts in East Denmark in 1992 – 2000. Journal of Forensic Medicine, 2003, p 284.
16. Lietuvos AIDS centro duomenys 2002. http://www.aids.lt
17. Nociar A. National Report on the drugs situation in Slovakia 2000. Bratislava, 2000. p. 95.
18. Oyefeso A., Ghodse H., Clancy C., Corhery J., Goldginch R. Drug abuse related mortality: a study of teenage addicts over a 20 – year period. Soc Psychiatry Psychiatr Epidemiol 1999 Aug; 34(8): 437 – 41.
19. Preti A, Miotto P, De Coppi M. Deaths by unintentional illicit drug overdose in Italy, 1984-2000. Drug Alcohol Depend 2002 May 1; 66 (3); 275 – 82.
20. Quaglio G., Talamini G., Lechi A., Venturini L., Lugoboni F., Mezzalani P. Study of 2708 heroin related deaths in north – eastern Italy 1985 – 98 to establish the main causes of deaths. Addiction 2001 Aug; 96 (8): 1127 – 37.

21. Seidler D, Schmeiser-Rieder A, Schlarp O, Laggner A N. Heroin and opiate emergencies in Vienna: analysis at the municipal ambulance service. Clin Epidemiol 2000, 53 (7), p. 734 – 41.
22. Shah R., Uren Z., Baker A., Majeed A. Trends in deaths from drug overdose and poisoning in England and Wales 1993 – 1998. J Public Health Med 2001 23 (3), p. 242 – 6.
23. Simonsen K. W., Anderson L. S., Jansen B. T., Kronborg K., Fischer K. V. Fatal poisonings among drug addicts in the country of Funen in 1995 – 1996. Ugeskr Laeger 1999 Dec 13; 161 (50): 6918 – 22.
24. Subata E. Nelegalių narkotikų ir alkoholio vartojimas. Pranešimas apie žmogaus socialinę padėtį Lietuvoje, Vilnius 1999, p. 157 – 163.
25. Toprak S., Pac M., Ersoy G., Akgual E. Drug overdose deaths in Istanbul. Forensic Scie Inter Vol 136, Suppl. 1, 2003, p. 310 – 311.
26. Valstybinio psichikos sveikatos centro statistiniai duomenys, 1997 – 2003 m. http://www.vpsc.lt
27. Virtanen A. National Report on the Drugs Situation in Finland 2001. National Research and Development Centre for Welfare and Health, STAKES, 2001, p. 178.
28. Volgram J. The analysis of fatal and non - fatal intoxications in Latvia (1995 –2000). Medicina Legalis Baltica, 2002, Nr. 13, p. 132 – 135.
29. VŠĮ Klaipėdos ligoninės AIDS centro duomenys, 1995 – 2003 m.m.
30. Vuori E., Ojanpera I., Nieminen R. Death among drug abusers in Finland. 4th Congress of the Baltic Medico – Legal Association, Estonia, Tartu, August 22 – 25, 2001.

SUICIDE PREVENTION AND OPPORTUNITES FOR YOUNG PEOPLE IN LITHUANIA

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SUICIDE AS A PROBLEM OF SOCIETY

In many countries, suicidal behavior constitutes a major public and mental health problem and a considerable drain on resources in both primary and secondary health care settings. In numerous countries, the number of suicides is significantly higher than the number of deaths due to traffic accidents. There are age and gender specific cultures of suicidal behavior. In many countries in same age groups, especially the younger age groups, suicide is ranked after accidents as one of the leading causes of death. Due to the changing age pyramids in some countries the problem of suicidal behavior among the elderly is also increasing. In recent years, especially in Europe, the rank order of suicide rates among the various countries has changed. This is partially due to the splitting up of countries. On the other hand, some countries have published official suicide rates for the first time in their history. This paper will provide a short overview of the latest available suicide figures in the world.

Suicide is the taking one's one life on one's authority. While suicide is not the major cause of death, it involves quite a big amount of people who are successful in their self-destructive efforts.

Because of the generally strong negative public attitudes about suicide, there are several reasons to question the accuracy of suicide statistics. For example, various local and state agencies are involved in clas-

sifying the cause of death. Research shows that judgments of officials are not uniform in determining whether a death is accidental, homicidal, suicidal, or due to natural causes. The resources available, the procedures used, the local laws, the willingness of officials to classify a suspected suicide as accidental, and the willingness of relatives and friends to tamper with evidence are all important factors. Thus the study of "official" statistics on suicide must be examined with considerable caution.

The number of people who attempt suicide is big. Young people are more likely to be *victims* of crime than any other section of society. Research suggests that women attempt suicide more often than men — at least twice as often. But men are more successful in committing suicide than women.

Some people think that by talking about suicide, the attention might encourage others to commit the act of suicide. Actually, the opposite is true. Open and honest discussion is the best prevention for suicide as well as any emotional, or even physical condition. How many people have been saved from Cancer because they shared a concern with someone who then helped them to seek help. Talking about suicide gives thought to the consequences and victims left behind. And with a little help and time, almost anyone can be helped with suicidal feelings. **But it has to be talked about first!**

Studies have shown that as many as fifty percent of the general public have seriously considered suicide as a solution to our problems., some time in everyone's life, everyone has had, at least, a passing thought of the suicide option. The danger is when a person thinks about suicide while they have depression - when thoughts have a hard time escaping the entrapment of a clouded brain.

Many people just don't realize that depression can cause so many problems or so much pain. Sometimes even people who are depressed don't take their condition seriously enough. Some people have the mistaken belief that depression comes from weakness or is a character flaw. This myth causes some people to hide their depression. Feeling embarrassed, they may avoid getting help.

Lithuania distinguishes by high rates of suicide. The tendency of growth of this rate is especially noticed during the last few years.

In Lithuania young people are experiencing the transition in their own special way. They have enormous opportunities, but even greater challenges at the very beginning of their adult life. They have the future

in their own hands, which for some youth is an ideal situation, while for many others is too challenging, regardless of their age and status in society. The chances that young people have for success depend both on the attitudes of society and on youth oriented in education, employment and human rights.

As we see it, a major problem is that many of the abused teens are "only" being abused emotionally now, so social service workers do not put a high priority on such cases. They are simply too overworked. Another problem is that often they are not even aware of suicidal teens before it is too late. Even when they are aware they can do very little to fill the teens' unmet emotional needs or to stop their emotional pain. Psychiatrists often try to put the teen on medication. But medication does not fill their emotional needs, nor does it make their parents better fathers or mothers.

From our observations, the greatest source of pain for these teens is feeling a lack of caring, respect, acceptance, support, and understanding from their own parents or gaurdians. To oversimplify, one can say it is coming from a lack of love - the love a parent normally gives those human beings entrusted to them. But the social services workers can't force parents/ guardians to give love. Nor can they force them to show caring, respect, acceptance, etc. Neither can they force them to feel caring, respectful, accepting towards their children and teens. If the feelings are not there, the behavior will never follow.

A social services worker in one country told us that they never prosecute emotional abuse cases since they are so overworked with physical and sexual abuse cases. Emotional abuse is also harder to see than other forms of abuse, perhaps especially for those who have experienced it.

Emotional abuse is also harder to prove in a court of law. This seems to be a flaw in our child protection services. As mentioned, studies show that emotional abuse can be more damaging than physical abuse. Another problem is that society, in general, is not designed to give parents the emotional competency training which they need. Parents are not trained in emotional skills and they are not tested for emotional intelligence or emotional competency.

THE SUICIDE PROCESS

Many people feel uneasy talking about suicide, in part because of a social taboo on talking or learning about suicide. One popular myth is that suicide should not be mentioned around depressed people because it would plant the idea in their minds. But most mental health professionals agree that people who have suicidal wishes can benefit by talking about their feelings.

Attitudes toward suicide have varied widely throughout history. In ancient Egypt people considered suicide a humane way to escape intolerable conditions. For centuries in Japan people respected instances of hara-kiri (ritual suicide with a dagger) as a way for a shamed individual to make amends for failure or desertion of duty. During World War II Japanese Kamikaze pilots considered it an honor to perform suicidal missions by crashing their airplanes into an enemy target. In India women were once expected to burn themselves on a funeral pyre after their husband died, a custom known as suttee.People are generally aware of suicide as a mean for terminating an untenable life situation. And while many people may think of self-destruction at one time or another, relatively few people take that course of action.

The scientists suggest that the suicide syndrome involves a three-step process. First, the person feels that there is no solution to the problem, except suicide. Second, the person begins to blame oneself for the situation. And third, the person experiences suicidal fantasies and mentally plays out the suicidal act.

Increased social isolation almost always accompanies suicide. There is usually a long history of problems. Some event occurs that triggers new difficulties or embellishes old difficulties. Because one is unable to resolve these difficulties, social isolation increases, and, ultimately, the person begins to feel totally helpless in solving the difficulties, except through suicide.

Most authorities on suicide believe that it is a social process. It involves learning. Unsuccessful attempts at suicide often cause others to change their behavior with regard to the suicidal person. Thus the suicidal person may attempt suicide to gain attention, change other's behavior, secure sympathy, and the like. It is almost always attempted while others are near.

MYTHS ABOUT SUICIDE

There are at least five distinct myths about suicide and suicidal people. As in the case of most myths, there is likely to be some substance to the myth, but the myth also involves so much exaggeration that it becomes counterproductive. These myths include:

1. People who talk about committing suicide never commit suicide.
2. People commit suicide without giving any warning.
3. People who attempt or commit suicide always want to self-destruct.
4. Suicide is the act of a person who is seriously emotionally disturbed or has serious mental illness.

The fourth myth about suicide - that is, people who commit suicide are mentally ill - requires some comment. First, people who commit suicide are not generally mentally ill nor do they suffer from temporary insanity. Family members, however, are often convinced that „no one in his or her right mind" would commit suicide, and their lost loved one is no exception. Second, obviously some mentally ill people do commit suicide, but there is a clear lack of evidence that the illness is the "cause" of the suicide. Third, in terms of current evidence, probably less than 25 % of all suicides involve people who are diagnosed as mentally ill. Finally, most people experience some "hopelessness" at some stage in their lives. Research indicates that a sense of hopelessness is clearly associated with suicide. And very rational people experience such hopelessness.

REACTIONS OF SURVIVORS

A suicide in the family causes serious emotional strain of survivors. If a child self-destructs, parents are often ripped by guilt, blaming themselves for not recognizing the problem in time. People outside of the family will also blame parents for the lack of sensitivity and awareness. If a parent self-destruct, children blame themselves and become so overwhelmed by guilt that they often become emotionally disturbed. A child typically has more difficulties in coping with suicide than an adult. Adults are more capable of neutralizing their guilt. We know that sorrow and guilt following a suicide are much more extensive than sorrow and guilt following the accidental death of a family member. Finally, research suggests that these and other debilitating symptoms often remain for many months after the suicide.

WHAT ARE THE MOST IMPORTANT PROBLEMS FOR YOUNG PEOPLE TODAY?

Today in Lithuania, young people are more "liberal, socially mobile and receptive to change" than people over 30 years old. Many young people think that they are not so well integrated in society. They often feel ignored or unprepared to compete on the labor market. What is striking though is that young people in many cases do not seem to be so interested in changing "this social alienation". So for example, according to the survey carried out in 2000, more than half of young people did not know about any organizations established specifically for them.

Due to the changing economic and social environment, the prestige of educated people has been increasing, thus, more and more young people seek better education. Out of the total number of schoolchildren who finished lower secondary school, almost all of them continued further. A bigger number of young people are inclined to work as high qualified specialists. Therefore, more schoolchildren, after finishing upper secondary schools, tend to seek further education.

The major concerns for young people in Lithuania are identified as unemployment and job security. Youth unemployment is becoming a key issue. According to the Labour Exchange, in 2001, on average, every fourth person registered with the Labour exchange was under 29 (with the total unemployment of 12%). According to the labour force survey, however, the actual unemployment level among young people is twice as high as the registered one.

The unemployment rate of young people is higher as compared to that of adults, nevertheless,

tendency of decline is being observed. Higher unemployment rate is characteristic to men and

urban residents. Young people having lower education face the most serious problems of

unemployment.

Feeling responsible for the future, young people try to attain better education and strengthen

their position within the labor market.

The suicide rate varies by age group. Suicidal behavior has numerous and complex causes. The biology of the brain, genetics, psychological traits, and social forces all can contribute to suicide. Although people

commonly attribute suicide to external circumstances, such as divorce, loss of a job, or failure in school, most experts believe these events are triggers rather than causes in themselves.

The majority of people who kill themselves suffer from depression that is often undiagnosed and untreated. Because depression so often underlies suicide, studying the causes of depression can help scientists understand the causes of suicide.

Lithuanian rebirth is set in a framework of disaster. The high mortality rates, decline of health, all educational indicators are in the danger zone, decline in the standard of living, growth of unemployment. The number of homeless people is now rising sharply.

The social identity is mostly based on national identity, dignity, self-respect, self-esteem and responsibility of people. Social identity is expressed as knowing and also as the feeling: of dependence to society and of responsibility to it and also as the wish to belong to it. It means, that each member of the society is aware about identity (is educated), will belong to the society (he/she participates in social life) and can achieve identity (the social conditions ensure a worthy human life).

The main threats to social identity in Lithuania are poverty, unemployment, increasing criminality. Social differentiation of the population becomes more pronounced than is acceptable for a normal society. For the majority of the population living standards remain low.

Economic poverty emphasizes breakdowns experienced in other areas, for example, the weakening and the breakdown of social ties, relationship difficulties, social discredit, exclusion and loss of identity. The personal and social impacts of unemployment, in their own turn, include poverty, financial hardship, incur debts, homelessness or overcrowding, the weakening of family ties or family dissolution; disintegration, isolation, erosion of confidence and self-esteem, atrophy of work skills, ill health. Poverty and unemployment keep individuals out of the society.

Poverty-related social exclusion is the most persistent danger to social identity and social cohesion. On the other hand, we can not describe the poor as a category or even a social class in the real sense of these terms. But poverty manifests itself not only in malnutrition, unemployment or homelessness. The biggest threat to social identity lies in the fact that poverty does not allow people to take full advantage of their citizenship. Many people, who may not actually be starving, are

Teenagers experience strong feelings of stress, confusion, self-doubt, pressure to succeed, financial uncertainty, and other fears while growing up.

For some teenagers, divorce, the formation of a new family with step-parents and step-siblings, or moving to a new community can be very unsettling and can intensify self-doubts. In some cases, suicide appears to be a "solution."

Depression and suicidal feelings are treatable mental disorders. The child or adolescent needs to have his or her illness recognized and diagnosed, and appropriate treatment plans developed. When parents are in doubt whether their child has a serious problem, a psychiatric examination can be very helpful.

SUICIDE "SIGNS"

Many of the symptoms of suicidal feelings are similar to those of depression. **Parents should be aware of the following signs of adolescents who may try to kill themselves:**

There are many behavioral indicators that can help parents or friends recognize the threat of suicide in a loved one. Since mental and substance-related disorders so frequently accompany suicidal behavior, many of the cues to be looked for are symptoms associated with such disorders as depression, bipolar disorder (manic depression), anxiety disorders, alcohol and drug use, disruptive behavior disorders, borderline personality disorder, and schizophrenia.

Some common symptoms of these disorders include:

- Extreme personality changes
- Loss of interest in activities that used to be enjoyable
- Significant loss or gain in appetite
- Difficulty falling asleep or wanting to sleep all day
- Fatigue or loss of energy
- Feelings of worthlessness or guilt
- Withdrawal from family and friends
- Neglect of personal appearance or hygiene
- Sadness, irritability, or indifference
- Having trouble concentrating
- Extreme anxiety or panic
- Drug or alcohol use or abuse

- Aggressive, destructive, or defiant behavior

Tragically, many of these signs go unrecognized. And while suffering from one of these symptoms certainly does not necessarily mean that one is suicidal, it's always best to communicate openly with a loved one who has one or more of these behaviors, especially if they are unusual for that person.

There are also some more obvious signs of the potential for committing suicide. Putting one's affairs in order, such as giving or throwing away favorite belongings, is a strong clue. And it can't be stressed more strongly that any talk of death or suicide should be taken seriously and paid close attention to. It is a sad fact that while many of those who commit suicide talked about it beforehand, only 33 percent to 50 percent were identified by their doctors as having a mental illness at the time of their death and only 15 percent of suicide victims were in treatment at the time of their death. Any history of previous suicide attempts is also reason for concern and watchfulness. Approximately one-third of teens who die by suicide have made a previous suicide attempt. It should be noted as well that while more females attempt suicide, more males are successful in completing suicide.

If a child or adolescent says, "I want to kill myself," or "I'm going to commit suicide," always take the statement seriously and seek evaluation from a child and adolescent psychiatrist or other physician. People often feel uncomfortable talking about death. However, asking the child or adolescent whether he or she is depressed or thinking about suicide can be helpful. Rather than "putting thoughts in the child's head," such a question will provide assurance that somebody cares and will give the young person the chance to talk about problems.

If one or more of these signs occurs, parents need to talk to their child about their concerns and seek professional help when the concerns persist. With support from family and professional treatment, children and teenagers who are suicidal can heal and return to a more healthy path of development.

TEENAGE SUICIDE

Most everyone at some time in his or her life will experience periods of anxiety, sadness, and despair. These are normal reactions to the pain of loss, rejection, or disappointment. Those with serious mental ill-

nesses, however, often experience much more extreme reactions, reactions that can leave them mired in hopelessness. And when all hope is lost, some feel that suicide is the only solution. **It isn't**.

According to the National Institute of Mental Health, scientific evidence has shown that almost all people who take their own lives have a diagnosable mental or substance abuse disorder, and the majority have more than one disorder. In other words, the feelings that often lead to suicide are **highly** treatable. That's why it is imperative that we better understand the symptoms of the disorders and the behaviors that often accompany thoughts of suicide. With more knowledge, we can often prevent the devastation of losing a loved one.

The Internet has given teens a new, safe place to express their thoughts and feelings. It has helped them feel less alone by making connections with others in similar life situations. Many of them find it much easier to write and chat about their lives online than to talk to someone in person or even anonymously on the phone. For those who won't talk to anyone else, for whatever reasons, the Internet has proven to be a lifeline.

The Internet has also provided unprecedented real-time access to their daily lives. They can chat and write about events in their homes as they are happening, or minutes after. Talking to them and listening to their stories years has helped us understand the cause and effect relationships between how they are treated and how they think, feel and act. We have had literally had an insider's view of what goes on in abusive homes. We have also learned how schools are often emotionally unsupportive or worse.

Talking to these teens and reading their online writing has opened our eyes to how incredibly thoughtful, sensitive and perceptive young people can be even in their early teens and pre-teens. It also increased our understanding of how much emotional pain they can be in, and where this pain comes from.

As we talk to them we try to build their self-esteems, give them some healthier coping skills and increase their emotional knowledge and understanding. There is a great need and a great opportunity for this type of help.

From my work I believe there is a direct and very strong connection between repeated abuse and suicidal feelings. While physical and/or sexual abuse by the parents and guardians has been present with every

teen we have helped, our observations support the research which shows that emotional abuse does the most lasting damage. In most cases there has been physical abuse up to around age 12. By then the fear of the parents is well established. After that, the abuse is primarily emotional.

Sometimes, though, the physical and/or sexual abuse also continues up to the time the adolescent is legally able to leave the parents. By this point there is often almost nothing left of the person's self-worth and self-esteem. Even if they are still alive physically, their souls and spirits have been all but killed. It takes an exceptionally resilient person to survive 16 or 18 years of abuse, but some do. Others, however, find the emotional pain too great and either kill themselves or make repeated attempts to do so.

CAUSES

While the reasons that teens commit suicide vary widely, there are some common situations and circumstances that seem to lead to such extreme measures. These include major disappointment, rejection, failure, or loss such as breaking up with a girlfriend or boyfriend, failing a big exam, or witnessing family turmoil. Since the overwhelming majority of those who commit suicide have a mental or substance-related disorder, they often have difficulty coping with such crippling stressors. They are unable to see that their life **can** turn around, unable to recognize that suicide is a permanent solution to a temporary problem. Usually, the common reasons for suicide listed above are actually not the "causes" of the suicide, but rather triggers for suicide in a person suffering from a mental illness or substance-related disorder.

More recently, scientists have focused on the biology of suicide. Suicide is thought by some to have a genetic component, to run in families. And research has shown strong evidence that mental and substance-related disorders, which commonly affect those who end up committing suicide, **do** run in families. While the suicide of a relative is obviously not a direct "cause" of suicide, it does, perhaps, put certain individuals at more risk than others. Certainly, the suicide of one’s parent or other close family member could lead to thoughts of such behavior in a teen with a mental or substance-related disorder.

Research has also explored the specific brain chemistry of those who take their own lives. Recent studies indicate that those who have at-

tempted suicide may also have low levels of the brain chemical serotonin. Serotonin helps control impulsivity, and low levels of the brain chemical are thought to cause more impulsive behavior. Suicides are often committed out of impulse. Antidepressant drugs affecting serotonin are used to treat depression, impulsivity, and suicidal thoughts. However, much more research is needed to confirm these hypotheses and, hopefully, eventually lead to more definite indicators of and treatment for those prone to suicide.

HOW TO HELP

Since people who are contemplating suicide feel so alone and helpless, the most important thing to do if you think a friend or loved one is suicidal is to communicate with him or her openly and frequently. Make it clear that you care; stress your willingness to listen. Also, be sure to take all talk of suicide seriously. Don't assume that people who talk about killing themselves won't really do it. An estimated 80 percent of all those who commit suicide give some warning of their intentions or mention their feelings to a friend or family member. And don't ignore what may seem like casual threats or remarks. Statements like "You'll be sorry when I'm dead" and "I can't see any way out," no matter how off-the-cuff or jokingly said, may indicate serious suicidal feelings.

One of the most common misconceptions about talking with someone who might be contemplating suicide is that bringing up the subject may make things worse. This is **not** true. There is no danger of "giving someone the idea." Rather, the opposite is correct. Bringing up the question of suicide and discussing it without showing shock or disapproval is one of the most helpful things you can do. This openness shows that you are taking the individual seriously and responding to the severity of his or her distress. Also, **never** assume that someone who is determined to end his or her life can't be stopped. Even the most severely depressed person has mixed feelings about death, wavering until the very last moment between wanting to live and wanting to die. Most suicidal people do not want death; they want the pain to stop. The impulse to end it all, though, no matter how overpowering, does not last forever.

If the threat is immediate, if your friend or loved one tells you he or she **is** going to commit suicide, you must act immediately. Don't leave the person alone, and don't try to argue. Instead, ask questions like,

"Have you thought about how you'd do it?" "Do you have the means?" and "Have you decided when you'll do it?" If the person has a defined plan, the means are easily available, the method is a lethal one, and the time is set, the risk of suicide is obviously severe. In such an instance, you **must** take the individual to the nearest psychiatric facility or hospital emergency room. If you are together on the phone, you may even need to call the police. Remember, under such circumstances no actions on your part should be considered too extreme—you are trying to save a life. An overwhelming majority of young people who hear a suicide threat from a friend or loved one don't report the threat to an adult. Take all threats seriously—you are not betraying someone's trust by trying to keep them alive.

OTHER SERIOUS CONSIDERATIONS

Don't automatically assume that someone who was considering suicide and is now in treatment or tells you that he or she is feeling better is, in fact, doing better. Some who commit suicide actually do so just as they seem to be improving. One reason for this may be that they did not have enough energy to kill themselves when they were extremely depressed, but now have just enough energy to go through with their plan. Another reason for suicide during a seeming improvement is that resigning oneself to death can release anxiety. While it's not good to monitor every action of someone who is recovering from suicidal thoughts, it is important to make certain that the lines of communication between you and the individual remain open.

While it may seem a bit obvious, it should also be mentioned that it is extremely advisable to bar teens who are suicidal from access to firearms. Nearly 60 percent of all completed suicides are committed with a firearm. And while having a firearm does not in itself promote suicidal behavior, knowing that one is accessible may help a troubled teen formulate his or her suicidal plans.

RESISTANCE TO REPORTING ABUSE

The teens we talk to are highly resistant to reporting abuse in their homes. They have learned it is dangerous to tell the truth to anyone. They have learned not to trust adults. We are discovering, in fact, that

one of the most damaging forms of abuse is convincing a child or teen that it is dangerous to tell the truth. This is what has happened to virtually every one of the teens we have worked with. These young people have learned they will be attacked, invalidated, disbelieved and punished for telling the truth.

They have also been made to feel guilty for hurting their parents, breaking up families, etc. One 15 year old told us it was her fault for breaking up the family when she reported that her step-father was abusing her. She told us she could have just put up with it till she was 16 when she could move out.

Another teen told us she was afraid no one would believe her since one time when she was 11 she reported to her school leaders that her mother was hitting her, but instead of believing her and taking real action, they believed her mother, who said the girl was a compulsive liar and was just trying to get attention. Now, besides feeling afraid she won't be believed, she is afraid her parents will just make her life more miserable if she reports the abuse. So instead of reporting it, she tried to kill herself recently. She talked to us that evening and told us she had cut her wrists. She asked us not to report it, but we felt obligated to call an ambulance and were able to get one sent to her house, even though we only had limited information about where she lived. She and her father thanked us later, but the mother who she lives with has taken away her Internet in an attempt to try to stop her from telling us what is really going on inside the home.

It is difficult for anyone to admit that they have been abused. It is especially difficult when the abusers are your own parents. Teens know that they will be talked about; that everyone at school will find out. This is extremely hard on them. They all yearn to be "normal." They know they will be treated differently by their peers. They also know there will be investigations and lots of questions and it will be extremely uncomfortable at home. They are afraid of punishment and retaliation if they report their own parents. When we have urged teens to report what is happening they say things like, "It is so easy for you to tell us to report it. You just don't understand how hard it is for us."

For many teens, even if they thought the authorities would believe them, they know there is no place to go once they have told the truth about their own parents. This makes it much harder for the teen to report

abuse and it makes our work and the work of all caring people much, much harder.

DRUG ADDICTION OF TEENAGERS: MYTH OR REALITY?

Today voices talking about new danger - drug addiction at schools - are heard more and more loudly. It is not easy to say how reasonable these fears are, as no serious and exhaustive researches have been made in Lithuania till today. The only obvious thing is that such phenomenon really exists, but its extents are unclear - they might be exaggerated by Mass Media, or might be unimaginable neither by Government, parents or teachers.

Impression is that this problem is absolutely new and unexpected, maybe that's the reason it seems so threatening.

In Western countries LSD is marketed to younger children with colourful designs or cartoon characters; children are re-selling prescription drugs as drugs; an animal tranquilliser called Ketamine is used; drugs help to maintain energy during all-night dance parties characterised by "rave" music. It is not new in Lithuania as well - more and more teenagers get to hospitals after poisoning by drugs.

The anti-drug education is not strong enough to counterpoise "education" received from surrounding environment, picked up from their peers and popular culture. Children are perceptive to novelties, and they receive news from movies, TV, video cassettes, CDs, magazines, websites and chat rooms. The fashions and tendencies of our contemporary culture propagate sometimes shocking values. Child or teenager is surrounded by lots of various messages about what is "good" about such substances as alcohol, tobacco or drugs. TV characters live in wealth and splendour off drug money; website urge legalisation of marijuana; hero of favourite movie star in his latest film is smoking cigar all the time; popular song describes how beautiful is Milky Way in the effect of drugs,.."Messages" related to drugs, alcohol, cigarettes can reach teenagers absolutely unexpectedly - from advertising published in the magazine, song played in a supermarket, saying of movie hero. These "messages" usually do not promote "the use" directly, but they are reinforcing impression that use is "normal" thing.

The truth is that adolescence is not easy period of human life, because young person is experiencing sudden body's changes, accompanied by mood changes and feeling of insecurity; he seeks to find out who is he and tries to adapt. According popular st, ereotypesteenagers are rebel and prone to danger, sometimes even to self-destruction, and influence of peers is very important for them. It is not surprising that during this period lots of young people try alcohol, tobacco and other drugs. For example, according to results of one American survey, the average age at which teens start using tobacco is a little past 12 years old; the average age at which they start drinking alcohol is almost 13; and the average age at which they start smoking marijuana is 14. Although the majority of young people do not use these substances, some children are using at even younger ages than these.

Why do children begin to use drugs? Parents think that their friends urge them to do that. But according the data of Department of Health and Human Services, young people themselves indicate these reasons why they use drugs:

1. To feel grown up
2. To fit in and belong
3. To relax and feel good

Young people are more inclined to start using drugs and engage in risky drug activities.Previously, the main drug resource was **opium preparations** made from poppies at **home** conditions. Currently **the latter** drugs of plant origin are being changed by synthetic ones.

According to the results of the survey on Lithuanian young people conducted by Sociology

88% of young people reported that they had never used drugs and refused trying them. Such an attitude is mostly characteristic to women and young people older than 24 years of age. 5.1% of young people have not used drugs but they consider them to be worth trying. Such an attitude is popular among young people under 19 years old and men. 0.8% of young people tend to use drugs occasionally. 0.3% of youth reported that they used drugs constantly. Speaking about propaganda against drug usage, young people are in favors of disciplinary and "repressive" ways of punishment.

As children reach adolescence, peer influences on personal behaviour can take on increasing importance in determining the use of drugs, alcohol, and cigarettes. If teenager thinks that his peers will disapprove and

denounce him, it's high probability that he won't begin using any of these substances.

Many young people harbor no hope for their futures, and turn to drugs and crime to quell their despair.

Deaths among young people rose by approximately 30% in both urban and rural areas. **The shift towards socially-related causes of death** As in previous years, most deaths fall into three main categories - circulatory system diseases, tumors and non-medical causes. They have become the principal cause of death among young and adult males: 80% of urban and 82% of rural deaths among young men (15-29) were not caused by illness, but by accidents.

WHAT PARENTS CAN DO?

If your child seems depressed and withdrawn, the experts suggest that you watch him carefully. Poor grades, for example, may signal that your teen is withdrawing at school. It is important that you keep the lines of communication open by expressing your concern, support, and love.

It's also important to seek outside help and support for your teen. Make an appointment with a mental health professional and go with your teen to the appointment. Share your concerns and fears about suicide openly with the professional so that any problems, such as major depression, can be evaluated and treated.

Remember that any ongoing conflicts between a parent and child can fuel the fire for a teen who is feeling isolated, misunderstood, devalued, or suicidal. Get help to air family problems and resolve them in a constructive way. Also let the mental health professional know if there is a history of depression, substance abuse, family violence, or other stresses at home, such as an ongoing environment of criticism.

Contact

It is well known that one of the most effective means to be applied to a person, who intends to commit suicide or is thinking of it, is an accepting contact, full of human understanding and support. It is a deeper contact, set up between two people, one of whom is in hopelessness, doubts, ambivalence of life and death, experiencing the feeling of deep isolation, and the other, prepared to help, wanting and having skills to do so,

as well as is accessible at the moment when the caller urgently needs him / her.

I am sure that expansion of work of telephone emergency services is a very promising sphere in suicide prevention, such as crisis prevention and intervention centres are indeed necessary.

It is psychological help line services that presently become the initiators of establishment of crisis prevention / intervention / postvention centres. **Contact, based on trust.**

The first Lithuanian psychological help line was established in 1982. It is Vilnius Psychological Counselling Line, which now works 24 hours a day.

In 1991, the first psychological help line (Vilnius Youth Line), run by trained *volunteer counsellors,* was established. All psychological help lines have an informational bank of psychological, medical and social support services. With the help of the informational bank, clients can receive information about other services, necessary for solving their problems.

I am aware that many face the same question; how can a telephone conversation help, especially if the help is provided by a volunteer counsellor and not by a professional of mental health? I will try to briefly answer these two questions.

Psychological help lines are of the easiest accessibility to people who think of suicide, undergo psychological crises or have other problems in their lives. This is especially valid for psychological help lines which operate 24 hours or at night. It is then the only possibility to directly address a person who is trained to listen and to help.

The staff members provide a listening ear to those in despair and tell callers where they can go to receive professional help.

In carrying out suicide prevention, an important role is played by services, which can provide specialised and general emergency help, that is by crisis prevention / intervention centres, or services that perform their functions. In Lithuanian, the function of suicide and crisis prevention / intervention is performed by telephone emergency service (psychological help lines). It is worth mentioning that workers of the vast majority of all Lithuanian psychological help lines, apart from direct help by phone, perform many more preventional functions, such as education of society (how to recognise suicidal behaviour and what to do when one knows that somebody intends to commit suicide), training of groups of society (volunteers, professionals, youth, etc.).

Property and social differences increase, social differentiation of the population is becoming more pronounced than is acceptable for a normal society. The middle stratum — base of stability of democratic society — is not increasing but decreasing.

These boundaries are strongly felt psychologically: the differences cause huge emotional conflicts. People remain silent, but the dissatisfaction is deep.

Alongside with the property differences the contrasts in education increase as well. Problems of accessibility of education in a broad sense are very acute.

Alongside the growing insecurity of incomes, the other serious social problem, breaking the social identity, is emerging: the loss of job security and the steady growth in official and unofficial unemployment. Some categories of people lost their jobs first: elderly women, workers with disabilities, young people, who have no specialization or profession. Hidden and open unemployment was steadily growing. The social stigma of unemployment is strong in society, and many people cannot overcome this psychological barrier.

The criminalisation of society and the rise in the crime rate threaten personal security.

Harsh economic realities, accompanied by the uncertainties over the future and the erosion of traditional social norms put additional strains on the individual. The disillusionment undermined people's abilities and caused apathy. People are becoming less careful with their lives and health, are lacking self-esteem.

In conclusion, I believe we must address the notion of teenage suicide with considerable energy. As mentioned before, they are our future. In this paper, I have wished to clarify some of the facts and figures about this topic, some of the causes, and possible things that can be done. In addition, it seems that Transactional Analysis has a great deal to offer in this area and to a large extent this has not been tapped yet. I hope for the sake of our future, this alters.

Suicide experts agree that there is rarely one single reason to explain why a person committed suicide. Suicide is usually the result of a complex set of factors that all contribute in one way or another to a person’s decision to commit suicide. Suicide memorials and contagion play just one small part in the potential suicide victim’s actions. *At Issue: Teen Suicide* examines some of the conditions that contribute to a pe-

rson’s decision to commit suicide, as well as the prevalence of teen suicide.

Most people who are depressed or who are thinking about suicide don't or won't talk about how they are feeling. They feel worthless. They have no hope. They deny their emotions or think that talking about their emotions will be a "burden" on others because no one cares. Or they are afraid others will make fun of them.

That's understandable, because when someone mentions suicide, others may treat it as a joke or deny it. Those reactions only make the problem worse. So, if a friend or relative brings up the subject, take it seriously and take some time to talk about it.

Žu-11 The Suicide Formula: monografija. – Vilnius: Mykolo Romerio universiteto Leidybos centras, 2004. – 208 p., 4 lentelės, 9 grafikai.

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Viena skaudžiausių šių dienų problemų Lietuvoje – didžiausias Europoje savižudybių skaičius. Daugelį metų ieškoma Vos problemos atsiradimo priežasčių ir bandoma rasti kovos su šiuo reiškiniu būdų. Šioje monografijoje stengiamasi įvairiais aspektais pažvelgti į priežastis, galinčias išprovokuoti savižudybes ar savižudišką elgesį: analizuojamos psichosomatinės tarpusavio priklausomybės, potrauminis stresinis sindromas, seksualinė prievarta prieš moteris, agresija ir savižudybės, terorizmas ir stichinės nelaimės, narkotikų įtaka savižudybėms ir jaunimo savižudybių prevencija.

Ši knyga skiriama teismo medikams, psichologams, psichiatrams, teisininkams ir visiems, dirbantiems savižudybių prevencijos ir jų padarinių tyrimo srityje.

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