

PSYCHOSOMATIC AND PSYCHOSOCIAL ASPECTS OF RISK PERCEPTION

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Abstract: When evaluating perception of environmental risks some psychosocial and psychosomatic factors may be of fundamental importance. This is the case in particular where our knowledge of the true health consequences of exposure to given factor is incomplete or its action is within the range of values where we do not anticipate biological effect. This applies not only in the case of indoor environment related complains but as well e.g. to non-ionizing electromagnetic radiation and electro-ionic microclimate. A serious consequence of the syndrome of mass hysteria is the fact that due to differently motivated disinformation part of the population can really suffer from some psychosomatic symptoms. Those imply objective suffering and deterioration quality of life for those affected.

Keywords: Risk perception, environmental risks assessment, psychosomatic aspects, psychosocial aspects of risk, health an illness, scientific and social models.

1. Introduction

Scientific and social models of health and illness:

When contemplating the problem of a healthy environment in relation to a sick one, it is necessary to define the relationship of *health* and *illness* in general. Currently, health is conceived as a condition of physical, psychic, and socioeconomic wellbeing. Contrarily, illness involves an extensive set of different experience or behaviour of the affected person. Different experience in the negative sense against the generally accepted standard is implying the deteriorated or endangered subjective condition or social function, feeling of undesirability, of being unwelcome and/or unexpected. The illness induces

some activities which aim is an improvement of the condition (Bencko and Honzák, 1997).

Every society responds to such impaired function by charging a number of individuals or institutions, which duties are to evaluate and interpret the actual condition, and provide the necessary measures. Medicine, or more specific public health actors (being an institution and scientific discipline as well) whose representatives are usually the physicians, is expected to react to these social needs. Medicine tries to build up a scientific model of illness, its diagnostics, treatment and prevention, yet this model often is neither identical nor congruent with the social one. There is a difference between *illness* and *disease*, same as difference of views concerning the therapeutic and preventive approach (Bencko, 2011).

The priority of the scientific approach is the attempted objectivity and criticism in collecting data and interpreting them. On the contrary, the social model is mostly based on subjective and strongly emotional attitudes. Both, the expert and lay community, are not immune against the harmful influence of myths. Science, however, is closer to truth, but not exceptionally, the science-based as well as lay models tend to misinterpret the situation, as confirmed by history. Science using objective methods is able to reflect its own failures but the subjective views often resist any logical argumentation. Nevertheless, even science operates with some traditional elements. Max Planck had once put it, *the new scientific truth would not win by convincing the opponents, but rather by letting the opponents die, and the new generation then adopts a new, and own truth.*

If rationally removing harmful effects and providing for a healthy living environment we have to consider both the scientific and social aspects, i.e. the views and needs of people living in particular environment.

2. Assessment of Ecological and Health Risk Factors/settings:

The assessment of potential ecological and health risks rising from the planned industrial, transport, waste treatment facilities and other construction activities becomes an indispensable part of their audit. Of course, the public health aspect of such activities is no novelty any longer as all above cited projects had legally been controlled and approved by the district or regional public health authorities, within the scope of the preventive supervision.

Whereas the initial phase of risk assessment, its identification or potential human exposure are of pure scientific character, the actual risk assessment increasingly assumes the arbitrary aspects (e.g. safety coefficients), risk communication, its control and management by way of psychological aspects the decision making then becomes a sheer political issue (Bencko, 2010). As

illustrating examples we can use problems related to conflicting views concerning e.g. health effect of electromagnetic field and electronic microclimate (Goldsmith, 1996).

The present approach to quantitative risk assessment artificially separating physiologically based pharmacokinetic (PBPK) model and biologically based dose response (BBDR) model needs to be substantially improved. The modelling procedure must go beyond the current organ-tissue based PBPK model as well as the hard-to-modify two-stage BBDR model. It is clear that a model must be flexible and capable of incorporating information about pharmacokinetics and cell signalling response (Bencko, 2010).

A limitation of the present approach to risk assessment is low dose extrapolation of cancer incidence data from both animal (experimental) and human (epidemiology) studies that are most frequently based on models that assume linearity at low doses/exposures. There are situations in which this assumption could be considered unreasonable. However, because of the lack of data and no alternative methodology for risk extrapolation at hand, the model of low - dose linearity continues being used despite existence of qualitative evidence showing otherwise. This is specifically relevant in the case of many non-genotoxic carcinogens modulating mitogenic stimulation or suppression of apoptosis - processes regulated by signalling through its impact on gene expression. Dioxins (TCDD) can serve as example of non-genotoxic carcinogen, endocrine disrupter acting through the Ah receptor. It is a general consensus that to resolve this problem, we need to develop a methodology incorporating biological data on mechanisms operating at cellular or molecular level.

3. Psychic Infection and Mass Hysteria

As every expert knows dealing with clients may sometimes bring about a number of both material and psychological problems. Besides, addressing a group of individuals, who, moreover, feel endangered is more complicated still, especially when these groups previously organized in harmony and certain hierarchy start to change in disintegrated ones whose behaviour rather suggest the behaviour of masses or mob. The mass psychology may appear whenever a sufficient number of persons are gathering around one point of common interest.

The psychology of the group never makes a mere sum of the member's psychology but it has its own individual characteristics. The group as whole, shows better quality than the most inferior members, but the worse judgement and lower IQ compared to the best individuals of the group, and it is prone to getting influenced rather by emotion than reality. Another characteristic is

behaviour of the group as a mob (aggressive, panicking, etc.) whose doings are almost always worse than those of an individual (Ali-Gombe et al., 1996; Bartholomew, 1993; Rotham and Weintraub, 1995).

The basic characteristic of mass dynamics is the "psychic infection" due to increased suggestibility responsible for the sensation of symptoms and subsequent chain reactions. A person in the mob then is capable of acts he/she would never have committed as an individual on his own. The cases of mass psychoses are well known from many literary descriptions of "mass hysteria" in real or supposed exposure to the toxic substances, or in health problems symptoms connected with the sick indoor environment (sick building syndrome) usually found in air conditioned houses (Klein and Bencko, 1991; Klein, 1993; Ruhl et al., 1993; Chang et al., 1994; Holcátová and Bencko, 1997).

In such cases they can be considered "objective", i.e. the patient really suffers from them. They remind of symptoms of acute distress but they are less intensive and last for a longer time, e.g. for many days, weeks, or months. The affected is aware of the overall stress and tension, fright, shyness, of sensations of oppressiveness and worries, when addressing other people, and vague stressing uncertainty for the future. All these symptoms are accompanied by chronic fatigue, headache, insomnia and other sub-acute vegetative disorders. As the syndrome is not fully invalidating the patient feels chronically unwell in both his daily duties and his reaction towards other people. Often his capacity of sense making activities becomes reduced as the result of chronic fatigue and impaired concentration.

The symptomatology fully corresponds to the term "somatization" introduced in the ICD-10 international classification. The point is that emotion - here a very strong one - finds its vegetative correlate occurring in the somatic sphere. An important role in further development plays the "interpretative model" of the patient being *xenochthonous* in our case (the cause of all trouble comes from outside) and the patient is aware of it (sick building, nearby radar station, TV tower, waste incineration plant).

The mass reaction can practically manifest by two syndrome levels: in one prevails the state of anxiety, in other prevail motoric symptoms (e.g. the medieval processions of flagellants praying for aversion of pest). The symptoms may appear separately or combined, or occur in turn in the patient. Mass hysteria afflicts men less frequently than women, especially those living in poorer socioeconomic conditions. Mass hysteria is closely connected with the problems of "sick indoor environment" illness. Important here is the firm conviction of outside noxae responsible for any kind of symptoms, further tendency to hypochondria and stress and also hostile attitudes of the patient to anybody to blame for these conditions, in practice materialized by endless

weary court trials. In a sense, also collective insistence on UFO and other paranormal encounters belong to this category.

Yet, not all mass-occurring pathological symptoms are mass-hysteria-related. For example the mass poisoning of school children in the school canteen in London can be mentioned, manifested by gastrointestinal troubles shortly after the lunch. The complex microbiological, hygienic, and toxicological examination included a questionnaire for children, which showed a significant link between the symptoms and consumption of raw cucumber (relative risk 6.1). Microbiologically the cucumbers were safe but pesticide contaminated, as proved by toxicology. In the discussion the authors warn against any overhasty diagnosis of mass hysteria.

Even when the concentration of toxicants fails to reach the risk values, other factors may be involved, e.g. ambient temperature, air humidity, etc., which have up to now not been included in our models but which are able to objectively influence the clinical course, morbidity and mortality rate (Aldous et al., 1994). There even may occur combination of the actual infection and mass hysteria. In some people evident hypersensitivity to some substances exists: their pathophysiological reaction then is capable of psychogenic effects on the environment.

Nevertheless, we presume the psychosocial aspects may be of basic importance in understanding the potential health risks. The more so, we can expect such problems when our knowledge of actual health effects of human exposure is incomplete or the intensity of exposure oscillates in levels raising doubts as to possible biological effects (Cikrt et al, 1993; Bencko, 2010).

Very serious problems, mostly in psychologically unstable patients, are neuro-psychic and psychosomatic symptoms resisting to treatment. Despite the difficulty in objectivization they represent suffering that should not be underrated considering the quality of patient's life.

4. The Challenges for Prevention

The prevention of such conditions can either be systematic: early educational or popularisation campaigns, specific health education orientated to the development of industrial, transportation, or other types of constructions, and integration of the local civic activities in the program. The purpose of this should not be a cheap belittling of the risk but reasonable explaining of its acceptable rate, and also advantage likely to come from the realization of the structures. Any later efforts to inform the public about the true state of affairs is normally accepted with distrust or hate, in belief this information had been well-paid by the government, industry tycoon, army, or some other institution trying to camouflage the actual condition.

5. Conclusion

It is therefore recommended to carry out a relevant, competent epidemiological pilot study on potential incidence of some health problems (tumours, congenital malformations, etc.) still before starting the structures, to compare - using a set of reliable data, when the building had already been approved for use - the incident phenomenon with the previous conditions. Such a study, of course, is no alibi. In cases of positive findings the study could serve as basis for rational measures to minimize the health risk due to the operation of the particular facility. The concept of health risk minimalization must be included as a leitmotif in all stages of the design and realization, covering all potential risks for the environment and human health.

In medicine, until our days, the Hippocrates' statement still holds: Life is short, and Art is long; the occasion is fleeting, experience fallacious, and judgment difficult. The physician must not only be prepared to do what is right himself, but must also make the patient, the attendants, and externals to cooperate. If we honour this in therapy, we should do so in preventive medicine twice as much (Bencko, 2011).

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