

ANPED Briefing paper MCS

Environment-related diseases: Multiple Chemical Sensitivity

Environmental diseases: many causes, many symptoms

While environmental law is very important to prevent health problems, health effects of environmental degradation are hard to assess, especially population-wide long-term effects of the ambient environment. Environmental standards usually are derived from animal studies, employing a safety factor of 100. The standard is supposed to protect the whole population, but there is mounting evidence that this is not the case. Current state of knowledge suggests, that there are vulnerable subgroups, such as children, whose sensitivity may lay several orders of magnitude below the standards. Then there are background concentrations of a cocktail of chemicals, to which the entire population is continuously exposed. Since an unexposed control group is hard to find, adverse effects to health are hard to assess. Chronic exposure to a mixture of environmental factors may work out very differently in different people, depending on genes and life history. Community health studies in polluted area usually show a heightened morbidity and a high percentage of unspecific symptoms such as headache, skin and lung problems, sleep disorders, chronic fatigue, concentration problems and a host of other symptoms. A common feature of environment-related health problems is that they are heavily disputed by professionals, or even debunked as a stress-related disorder, which has nothing to do with environmental quality. Yet, there is plenty of evidence that we have an emerging health problem, affecting millions of people, from background exposures alone.

Chemical intolerance, a growing public health problem

The past three decades we have seen an unprecedented rise in asthma and allergies, which still continues. Some 25% of children currently born in industrial countries are predisposed to asthma or allergies, and this figure is still rising at an astonishing rate. This figure is markedly lower in Eastern Europa, which suggest one or more factors associated with Western society. Among environmental factors suggested are chemicals from consumer products and higher exposure to electromagnetic fields (standards for EMF are an order of magnitude lower in Eastern Europe than in the US and Western Europe). Prenatal expose to development disruptors (like POPs, plasticizers and synthetic fragrances) disturb development of the immune system, central nervous system and lung. Traffic-related particulate matter has shown to afflict lung development in schoolchildren. Although there is still a lot of uncertainty to the causes, it requires little imagination to predict the consequences. More sensitive people implies more people with hypersensitivities, people who get really ill from current exposure. Even if the standards were adequate in the first place: if the population becomes more vulnerable as a whole, an increasingly larger percentage will no longer be protected.

Hypersensitivity to chemicals or odours is not necessarily an asthmatic or allergic response. Many people experience adverse reactions to environmental chemicals, which are not allergic by nature. These non-allergic responses are called *intolerances*, because the mechanisms involved are different from allergies in the classical sense. Chemical intolerance is a widespread phenomenon. Various epidemiological surveys indicate a prevalence of 15-37% (in the US). It is not yet recognized as a public health concern, because most people are intolerant to some 3-5 common environmental substances, such as cleaning agents, perfumes, tobacco smoke or solvents. As long as exposure to these substances can be avoided, there is not much of a problem. Allergy and asthma patients can

mask their symptoms with immunosuppressive medication. MCS patients cannot, either because of adverse reactions to drugs, or because the drugs suppress only a part of the symptoms.

Multiple Chemical Sensitivity

Multiple Chemical Sensitivity (MCS) is a condition, where very small concentrations of a great number of chemicals can invoke a number of adverse reactions. MCS patients fall ill from ambient environment at home or at work or both. MCS patients typically have a history of previous exposures and increasing sensitivity to an ever expanding number of substances. Severe cases combine intolerance with allergies and live very secluded life, taking great pains to keep their home free of all sorts of chemicals. The prevalence of MCS is estimated 2-6%, depending on the definitions employed. (For information: prevalence of diabetes is 6.3 % in the US.)

As of yet, there is no medical consensus about the definition, the causes, the mechanisms the prevalence or even the existence of MCS. The numerous symptoms and affected organ system suggest that MCS is a label for a number of different diseases, with a number of different environmental determinants. This feature is shared with Gulf War Syndrome, Sick Building Syndrome, Chronic Fatigue Syndrome and many others. In fact, there is considerable overlap in symptoms too, also with other more or less contested diseases like fibromyalgie, food allergy, OPS or organopsychic syndrome (solvent-related occupational disease). Despite this overlap of symptoms, there is a practical reason for the MCS label: MCS patients are most vulnerable to environmental triggers and their primary concern is how to survive our present environment.

Environmental diseases and recognition

Current evaluation of the Gulf War Syndrome concludes that 1) there is a number of severe health problems, which probably have been caused by environmental exposures during the Gulf War, 2) there is not a single agent to be blamed for the Gulf War Syndrome 3) Gulf War Syndrome is not a single disease 4) authorities' unwillingness to acknowledge the reported diseases as real and connected with the Gulf War has added considerable to the suffering of patients. Similarly, in the organopsychic syndrome, exposed workers have gone a long way before the disease was acknowledged. But although it is an official disease, there is still considerable difficulty with the diagnosis. It is a diagnosis by exclusion of other, known conditions corresponding with the symptoms AND there has to be a documented history of massive exposure. Many MCS patients recognize themselves in the OPS description, but were either only once exposed to a high dose of environmental chemicals, or for a prolonged time to lower concentrations, or their exposure status is not documented.

Only few countries have adapted their legislation in such a way, that MCS is acknowledged as occupational disease. Clinical facilities are practically non-existent and there is pitifully little funding for research.

MCS , does it exist?

The fact that a disease is unexplained automatically classifies it as a 'somatoform disorder', allegedly caused by psychiatric mechanisms. Since most social support and care systems are organized about a distinction between the mind or the body, this qualification places MCS patients in an unfavourable position when they express their needs. Yet, there is no doubt, that among MCS patients there is a higher incidence of psychiatric disorders, but not more so than among other chronic diseases. Given the profound impact a chronic disease has on a person's life, the group is most vulnerable to psychiatric disorders *resulting* from their condition. Cognitive psychotherapy has been proved effective in improving health of most chronic conditions, including rheumatism, cancer and chronic fatigue syndrome, probably because it addresses the results of the disease. There is no data about psychotherapy and MCS.

There is also some evidence that MCS patients' sensitivity to environmental contaminants may be a conditioned response, a psycho neurological feedback loophole run awry (neurobehavioral

sensitization), but that doesn't make MCS a psychiatric disorder. One subpopulation of MCS patients has genetic abnormalities, related to the body's enzymes of detoxification. Another subset shows abnormalities in the hypothalamic pituitary axes. Abnormalities in growth hormone and insulin-like growth factor have been found in 25% of the related disorder fibromyalgia. Given that there is evidence of a general heightened sensitivity to stimuli in patients with related disorders such as fibromyalgia and chronic fatigue syndrome, multiple sensitivity may well be a symptom of an underlying disturbed balance of the nervous and/ or endocrine system.

So far, there is ample reason to conclude that MCS is the result of a number of vulnerabilities, as well as a number of initiating factors.

Women, a vulnerable group

Typically women are hugely (5 to 8 fold) overrepresented in MCS and related disorders. Partly, this may be due to behavioural differences, partly because women in general are more vulnerable to chronic disorders. For one thing, mortality among male patients with MCS and related disorders have a higher mortality than female patients. Yet, menstrual disorders, including PMS and endometriosis are among the frequently mentioned symptoms. There is some evidence, that both are related to environmental exposures. At the moment, there is a huge gender gap in toxicology and epidemiology of occupational diseases. Recently, epidemiological evidence showed that smoking costs women 11 years of life expectation. For men, it is 3 years.

The female body has a larger fat percentage, which makes women's bodies a dump place for fat-soluble persistent chemicals. Apart from adverse effects to the women themselves, this constitutes a hazard to babies in the womb, because these substances are mobilized during pregnancies.

Is MCS the tip of the iceberg?

It could be. The case of MCS and related disorders shows how difficult it is to diagnose environment-related disease, despite the severity of symptoms. The public health problem could, in fact, be much more extensive than the considerable prevalence of MCS and related disorders suggest. Many patients seeking primary care suffer from symptoms that cannot be related to a known, medically acknowledged disease. By default, such complaints are diagnosed as psychogenic. Depression, chronic fatigue and burn out amount to tremendous social costs in terms of absenteeism of work and primary care. It seems that the term 'somatiform' or 'psychogenic' disorders is as much a garbage can of poorly understood symptoms as any disease with unknown cause. Yet the staggering prevalence of chemical intolerance and the tremendous rise of asthma and allergies bode ill for the future.

MCS patients as canaries of modern society

Miners used to take caged canaries into the mine. The birds, typically much more vulnerable to mine gas, gave early warning, so that the miners could get away in time. Regardless their special vulnerabilities, which they don't seem to share with the rest of the population, there is ample reason to heed the warning they provide and to reduce exposure.

There are more than 100.000 chemicals in use, and 99% have not been properly evaluated for subtle, chronic and prenatal effects

Chemical consumption worldwide is rising and toxic waste as well as environmental pollution is causing huge health problems in the developing world

There is mounting evidence that prenatal exposure affects lung function, immune system and development of the nervous system, thus contributing to population vulnerability to environmental stressors

MCS may very well be only the tip of the iceberg, given the widespread phenomenon of chemical intolerance and the problems people with asthma and allergies experience with ambient environment

Environmental policy and MCS

WHO has acknowledged, that we know too little of chronic exposures to cocktails of environmental stressors, and that environmental legislation is inadequate in protecting the most vulnerable groups. There are issues of environmental justice here, because exposure to chemical pollution is, in many cases, unavoidable. Problematic chemicals for allergic and asthmatic people as well as for people with chemical intolerance include solvents, pesticides and synthetic fragrances, substances which are practically everywhere.

The lack of recognition of environmental disease is a huge problem for individuals and groups suffering from local sources of pollution. It is impossible to prove the relation between health complaints and environment, usually leading to debunking the community health problems.

At the moment, the EU is preparing legislation (REACH) to evaluate all chemical substances on the market for adverse effects to health and environment, with maximum transparency to consumers and the general public. At the same time, a lobby of the chemical industry and other economic interest groups, including the US government exerts huge pressure to weaken the REACH proposal. This should not happen.

Governments are currently in denial. But they need to act now to reduce exposures and to take special care to protect children and other vulnerable groups. They also need to invest in research into MCS and related disorders.

Weblinks

Human Ecology Action League, <http://members.aol.com/HEALNatnl/index.html>
Environmental Health Network of CA, <http://users.lanminds.com/%7ewilworks/ehnindex.htm>
Support Network for the Aldehyde and Solvent Affected, www.ncchem.com/supald.htm
Chemical Injury Information Network, www.ciin.org/
Australian Chemical Trauma Alliance Inc, <http://members.ozemail.com.au/~actall/index.htm>
MCS Survivors, www.mcsurvivors.com/
Gulf War Veteran Resource Pages, <http://www.gulfweb.org/>

Further reading

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The Interagency Workgroup on Multiple Chemical Sensitivity. A Report on Multiple Chemical Sensitivity. Atlanta: Agency for Toxic Substances and Disease Registry, August 24, 1998, p 45
American College of Environmental and Occupational Medicine, 1999. Position statement MCS, <http://www.acoem.org/guidelines/article.asp?ID=46>