

**WHO workshop on Electrical Hypersensitivity
Prague, Czech Republic
October 25-27, 2004**

WORKSHOP SUMMARY

Background

As societies industrialize and the technological revolution continues, there has been an unprecedented increase in the number and diversity of electromagnetic field (EMF) sources. These sources include high voltage power lines, radars, video display units associated with computers and TVs, radio and television broadcasting stations, mobile phones and their base stations, microwave ovens as well as security, anti-theft devices, automated highway toll systems and fluorescent lights. While these sources have made our life richer, safer and easier they have been accompanied by concerns about possible health risks due to their EMF emissions.

For some time a number of individuals have reported a variety of health problems that they relate to their exposure to EMF. The EMF levels to which these individuals are exposed are generally well below recommended exposure limits and are certainly far below those known to produce any adverse effects.

The reported sensitivity reactions include a wide range of non-specific symptoms, which afflicted individuals attribute to exposure to EMF. The symptoms most commonly reported include dermatological symptoms (redness, tingling, and burning sensations) as well as neurasthenic and vegetative symptoms (fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitation, and digestive disturbances). Some individuals are so severely affected that they cease work and change their entire lifestyle, while others report mild symptoms and react by avoiding the fields as best they can.

The reported symptoms are not part of a recognized syndrome and have been generally termed as “electrical hypersensitivity” or “electromagnetic hypersensitivity” (EHS). However, the term EHS is ill-defined and is frequently used in two different contexts:

- as a medical condition based on the afflicted person’s interpretation of the cause of their ill health, but irrespective of any established causal relationship;
- to describe the ability of certain individuals to perceive or react to EMF at significantly lower levels than most people.

Workshop objectives and scope

To address the issue of potential electromagnetic hypersensitivity, the World Health Organization (WHO) convened a Workshop on "Electrical hypersensitivity" in Prague in October 2004. This meeting was co-sponsored by the European Commission Coordinated Action EMF-NET, the European Cooperation in the Field of Scientific and Technical Research (COST 281), and the Ministry of Health of the Czech Republic. The meeting comprised a 2-day international meeting, open to all persons who wished to contribute and/or attend (see [Rapporteur report](#) for further details). This was followed by a 1-day working group meeting, which included the speakers, the WHO secretariat and other interested parties (see [Working Group report](#) for further details). The working group meeting included break-out sessions on the

following topics: (i) Characterization, diagnosis and treatment, (ii) Research needs, and (iii) Policy options.

The purpose of the Workshop was to conduct a thorough review of the scientific evidence to determine if there is a relationship between EMF exposure and the symptoms reported by EHS individuals and what further research is necessary to fill any gaps in knowledge about the condition and its management. In addition, the Workshop reviewed what had and could be done to assist EHS individuals.

Conclusions from the workshop

EHS is characterized by a variety of non-specific symptoms that differ from individual to individual. The symptoms are certainly real and can vary widely in their severity. For some individuals the symptoms can change their lifestyle.

The term "Idiopathic Environmental Intolerance (IEI) with attribution to EMF" was proposed by the working group to replace EHS since the latter implies that a causal relationship has been established between the reported symptoms and EMF. The term IEI originated from a workshop convened by the International Program on Chemical Safety (IPCS) of the World Health Organization (WHO) in 1996 in Berlin. IEI is a descriptor without any implication of chemical etiology, immunological sensitivity or EMF susceptibility. Rather it has been described as:

- an acquired disorder with multiple recurrent symptoms,
- associated with diverse environmental factors tolerated by the majority of people,
- not explained by any known medical, psychiatric or psychological disorder.

IEI incorporates a number of disorders sharing similar non-specific medically unexplained symptoms that adversely affect people and cause disruptions in their occupational, social, and personal functioning.

The majority of studies indicate that IEI individuals cannot detect EMF exposure any more accurately than non-IEI individuals. By and large well controlled and conducted double-blind studies have shown that symptoms do not seem to be correlated with EMF exposure.

There are also some indications that these symptoms may be due to pre-existing psychiatric conditions as well as stress reactions as a result of worrying about believed EMF health effects, rather than the EMF exposure itself. It was added that IEI should not be used as a medical diagnosis since there is presently no scientific basis to link IEI symptoms to EMF exposure.

Recommendations for medical evaluation

Whatever its cause, IEI can be disabling for the affected individual. Treatment should focus on the health symptoms and the clinical picture by performing:

- a medical evaluation to identify and treat any specific conditions that may be responsible for the symptoms,
- an assessment of the workplace and home for factors that might contribute to the presented symptoms. These could include indoor air pollution, excessive noise, poor lighting (flickering light) or ergonomic factors. A reduction of stress and other

improvements in the work situation might be appropriate. EMF might be assessed to ensure that levels of exposure meet existing standards and recommendations.

- a psychological evaluation to identify alternative psychiatric/psychological conditions that may be responsible for the symptoms.

Some studies suggest that certain physiological responses of IEI individuals tend to be outside the normal range. In particular, the findings of hyper reactivity in the central nervous system and misbalance in the autonomic nervous system need to be followed up in clinical investigations and the results for the individuals taken as input for possible treatment.

Under the umbrella of WHO's EMF project, internationally qualified physicians should develop a "best practice" protocol for managing IEI individuals and provide this information to national health authorities for implementation at the local level.

Research recommendations

Because EMF has not been established as a causative factor for symptoms of IEI individuals, the focus of research should be on characterizing their physiological responses.

Normally there are two types of human studies conducted to determine the toxicity of an agent. First, epidemiological studies can be used to inform on the occurrence of a disease. However, for IEI, epidemiological studies are not considered helpful because the definition of an IEI individual is still lacking and so it is not possible to design a useful study. Second, provocation studies on human volunteers can usually inform on issues such as causality and other aspects of the symptoms. To date provocation studies with double blind exposure sessions have failed to verify a causal relationship between electric, magnetic or electromagnetic fields and symptoms. If provocation studies are to be considered, they should be properly designed and include ethics committee approval.

Advice to national authorities

National authorities should not ignore the plight of IEI individuals as it affects some 2-3% of populations in a number of countries. Governments need to provide general physicians with appropriate advice based on information provided by qualified experts. To that end, it was recommended that WHO issue a fact sheet that contains information on the symptoms of IEI individuals, indicating that, at present, these symptoms cannot be attributed to EMF, warn against commercial products to shield against EMF and provide advice on how best to manage IEI.

Governments should also note that IEI patients have real symptoms, but that there is no scientific evidence of causal link with EMF exposure, and therefore no grounds to use IEI as a diagnostic classification. Further there is no indication that lowering internationally accepted limits would reduce the prevalence of symptoms attributed to EMF. More generally, governments should anticipate problems with new technologies, develop adequate general risk communication strategies, provide balanced information and promote dialogue on related issues.