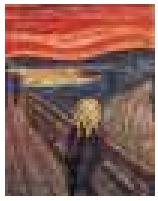
Symposium proceedings



Internationaal symposium

Understanding electrohypersensitivity - EHS

December 8, 2006
Utrecht – the Netherlands

Working group on electrical hypersensitivity
Platform health and environment

Opening address

Ladies and gentleman,

I have the privilege of organizing the first symposium that focuses on the problem of electrical hypersensitivity -or EHS as it is called nowadays. There have been several meetings in Europe before on the topic of EHS but the emphasis has usually been on the question whether the problem really exists. And on whether people can really suffer from exposure to electromagnetic fields (EMF) to which they have developed a curious and disabling hypersensitivity.
Today, our starting point is that such people exist, that they deserve attention and respect and that measures should be taken to make a normal life at home and at work possible for them. We hope to exchange knowledge and expertise from the speakers as well as from those participating in discussions.
We have here an assembly of some 65 participants, all with keen interest in this matter, without doubt. But we hoped for a larger representation of health authorities and press. Some are here anyway, but we keep trying to stimulate interest and public debate even better. With the ever-increasing impact of EMFs from digital electronics and cordless or mobile communication systems problems are bound to increase rapidly. Let's hope that our insights lead to a better understanding and general acceptance of the EHS problems and do something about it.
I wish you a meaningful meeting!

Dr. Hugo Schooneveld
Chairman of the Dutch working group on EHS, the WEO

Parade of authentic electrohypersensitive persons

Three adult persons report on the EMF factors causing their disabling sensitivity, the health problems that emerged as a consequence of the inflicted stress reactions, the measures taken to eliminate the most annoying EMFs and the way in which they rearranged their lives in order to keep fit for family relations and work and enjoy life.
Names and addresses of these persons are available on demand.

Symposium papers

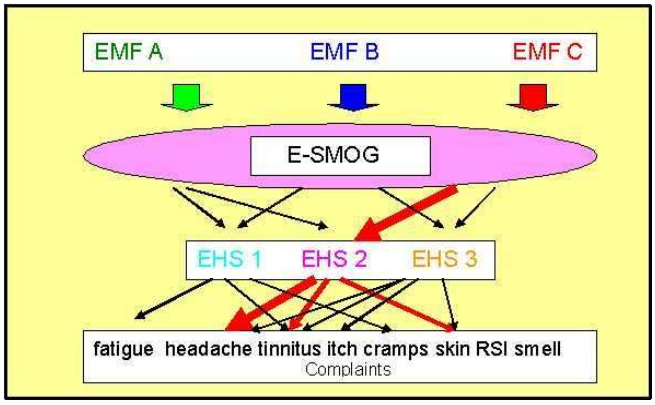
Overview of the EHS problem

by Hugo Schooneveld

- Working group on Electrical hypersensitivity –EHS
- Foundation of EHS

www.electroallergie.org

See the connection!
Some people develop electrical hypersensitivity to *certain* types of EMF and develop *certain* of the health problems related to conflicting fight/flight syndromes
EHS may occur in all ages, social classes and professions. Jobs with high or long exposure to low-frequency and pulsed high-frequency EMFs present relatively high health risks. These conclusions were drawn from questionnaires completed by 200 EHS people in the Netherlands.



Proposed scheme showing the strict individual relationship between physical character of disturbing EMF and specific type of stress response.
Follow the red line
'Electrosmog' contains EMF from several sources. Person *2* is sensitised only for source *C* and suffers from headache as his primary stress symptom.

Progression of EHS
Electrosensitivity usually increases and broadens over the years: thresholds are lowered, the range of disturbing EMFs widens. EMF field strengths causing discomfort may be several orders of magnitude lower than those accepted as safe by several health authorities. Complaints disappear after the removal of ambient magnetic and electric fields.

Perception of EMF
Most EMF types do not bother most of the people. Pulsed high-frequency fields from most types of wireless communication systems, some of the low or intermediate frequencies (up till some ten-thousand Hertz), and extremely-low frequencies (ELF) present a major hazard. Especially when the pulse shape is not sinusoidal or when pulses have steep flanks and occur non-continuously, such fields are to be feared. Fields radiating from electronic equipment are frequently disturbing, even when field intensities are well below 1nanoTesla (magnetic alternating fields) or below 1V/m (electrical fields). It is desirable that appropriate measuring equipment is developed to monitor such specific fields.

Recognition of EHS
Health authorities have so far failed to accept the existence of EHS and organizations like the European Commission and World Health Organization openly criticize research directed to solve basis questions and also discourage such research. This attitude is clearly unfair to those suffering from EHS and is jeopardizing attempts to comprehend the growing incidence of environmental diseases. Social and economic welfare is even put at risk.

Why are certain EMFs disturbing?
Many electronic parts wire networks emitting high or low frequencies may be disturbing and we want to know what the physical nature is of the disturbing parameter (if there is such a discriminator). EHS people are usually advised to limit the use minimal electric equipment and not to live under GSM/UMTS masts, to abandon their mobile phone and digital home phone of the DECT type. Further, all equipment equipped with digital power supply and LCD screen is to be kept at a distance as well as electric motor and generators of all types are potentially harmful. We are currently working on determining the relevant field parameters so that people may be given better advice as which fields to be feared and which are acceptable.

Delayed effects
Most EHS people report that harmful magnetic field effects take place a few to several hours after exposure to a certain field . This delay in response is the reason why the relation between exposure and effects is usually not seen and medical help is always inadequate. Information should be made public to prevent that too many people are invalidated by unknown exposures to EMF.

Diagnosis
To date, no biological marker is available to assess the state of electrosensitivity. Research should focus on the discovery of such markers for use in medical practices and field sanitation. It is vitally important for scientific experiments that volunteers are selected on the basis of sound biomedical diagnosis or on psychological and cognitive test results, or both.

Scientific experiments
Research on EHS needs a multidisciplinary cooperation for optimizing chances for success. Factors to be taken into consideration are, for instance:

- Selection of useful and well-screened volunteers for experimental and control groups
- Selection of provocation conditions relevant to personal and individual sensitivity reports
- Selection of the appropriate evaluation method, based on the individual's report.

Experiments not paying attention to individual differences in field sensitivity and effect are not to be taken seriously. There is a need for combined efforts in biomedical and psychological disciplines to work out the best way of assessing individual EHF problems.

Monitoring EMF-related Health Problems in the Netherlands

Miep Verheuvel, biologist MNGM

www.gezondmilieu.nl

The Dutch Monitoring Network Health and Environment (MNGM) is a non-profit, non-governmental organisation, which registers environmentally related health complaints since 1994. Health complaints as well as environmental factors are encoded and recorded in a nationwide database. Researchers and research institutes can make use of the data, founded exclusively on perception, to build hypotheses and ideas. The database is not of epidemiological or geographical significance. The system is comparable to the registration of adverse side effects of pharmaceuticals, after they have been released on the market. For this occasion we selected the physical environmental factors, according to EMF and present them as functionality of time. We discuss the numbers of individual complainers and the health complaints and compare the patterns of health complaints with the outcome of the inquiry on electrohypersensitive persons. It is shown that health complaints expressed by people affected either by HF EMF of base stations or by LF EMF radiating household electronics and electric appliances have much overlap. Fatigue, headache and insomnia are reported most frequently. Further, several of these persons reporting to the MGM appear to have a medical history of immunological derangements, multisystem diseases such as MCS, CFS, fibromyalgie, and damaged nervous system by organo-psychosyndrome , multiple sclerosis, Lyme disease and by medical treatments, hospitalization and narcoses. It is noteworthy that several of the health symptoms registered were already seen much earlier in East-European countries as described by Gordon in 1966.

Much remains to be investigated to reveal the biological mechanism leading to EHS. A plea is made for the establishment of a Centre for Environmental Health Research, with sections for home sanitation and a training facility for environmental physicians.

Sources of hazardous electromagnetic fields

Michiel Haas
Instituut voor Bouwbiologie en ecologie (NIBE)

www.nibe.org

Dr. Haas elaborated on all hazardous sources of EMFs outside, in the office and at home. Based on measured emissions of field strength and duration of exposure, he presented the following Top-10 sources of electrosmog: DECT phones - waterbed - electric alarm clock- wireless network - hand piece of mobile phone for kids - microwave oven - electric installations - electronic blanket - induction heater and TV. Haas' company - the NIBE- is using this and other information for designing 'healthy' housing and offices.
Further EMF sources are electronics in car, buses and trains, GSM handset, nearby base stations, overhead power lines, railway traction power lines, fluorescent advertizing in shopping malls, and overhead high-voltage power lines.
Conclusion: Electrosmog is an important reason for chronic tiredness, stress, aggression, depression, and other civilization illnesses, even cancer. In the past 100 years is the chance to get one of illnesses increased from 1:4000 to 1:2!

Electromagnetic Hypersensitivity: A still open question

Professor Dr. Norbert Leitgeb

Institute of Clinical Engineering, Graz University of Technology, Austria

There is no doubt, that an increasing number of persons suffer from non-specific health symptoms and, in case of missing medical explanation, attribute them to environmental electromagnetic fields. However, the term electromagnetic hypersensitivity is ill-defined. It is used in different context:

a) as a medical term attributed to afflicted patients irrespective of any causal relationship with EMF;
b) to describe the ability of individuals to perceive EMF at significant lower levels than most people;
c) to describe a yet hypothetical adverse interaction of environmental EMF with people of increased sensitivity.

By now, in spite of many attempts, no causal role of environmental electromagnetic fields in the development of adverse reactions could be proven nor was it possible to identify a specific symptom cluster to associate it with a clinical EMF syndrome. However, the awareness of the problem is high. An inquiry among Austrian physicians showed that an overwhelming percentage of them beliefs that environmental EMF could be associated with the initiation and/

or progression of non-specific health symptoms. It could be shown that the results of studies on EHS people critically depend on the strategy of selecting volunteers. This makes it difficult to draw a final conclusion from existing literature. In the meanwhile enough data from the general population could be collected to allow identification of persons with significantly increased electromagnetic sensitivity. This is done by repetitive measuring their perception ability for electric currents directly applied at their forearms. The threshold value and its variance have proven to be a valuable tool for such a differentiation.
People claiming to be electrohypersensitive show a higher than average sensitivity in this assay than an 'average' citizen. There is a clear difference among EHS people as to the time of the day when highest sensibility for electric stimulation of skin of underarm is reported. Therefore, daily fluctuations should always be taken into account.
In another experiment, people claiming electrosensitivity towards HF EMFs from mobile phone base stations were subjected to experimentation in their own bedroom. The question was if shielding the bed from such EMFs with HF reflecting cloth would allow these volunteers to sleep better. Experiments are still underway, but the first impression is that there is no clear-cut evidence that the presence or absence of such protective cloth could be truly noted.

Need of epidemiological studies on EHS effects.

Professor Dr. Lucas Reijnders,
Institute of biodiversity and ecosystem dynamics

There are as yet very few good epidemiological studies dealing with the potential risks of radiofrequency electromagnetic fields used for cordless communication. The few exceptions include the studies of Hutter and others (et al.) (concerning GSM base stations) and of Lönn et al. (dealing with handy's). This is partly a reflection of a more general imbalance between money spent on the development of new cordless technologies and money spent on preventing or limiting adverse unintentional effects thereof. This is in sharp contrast to the longstanding practice of preventing and limiting unintended effects of new chemicals. It may also be a reflection of the communication industries' unwillingness to face the possibility that unintended effects may occur.
At the present rate, it will take us probably a further 10-20 years before we have a reliable picture of unintended effects. In view of the general use of cordless technologies this would seem unacceptable. A crash program of epidemiological research (as a part of a more general crash program of empirical research) is needed. Obvious matters of interest for further epidemiological studies are potential effects on the central nervous system, tumour risk and within-population variability of sensitivity.

Lönn, S. et al. Mobile phone use and the risk of acoustic neuroma. Epidemiology 15 (2004) 653-659
Hutter, H.P et al. Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. Occupational and Environmental Medicine 63 (2006) 307-313

Funds for the program “EMF effects on health research”

Julia van Os
Zorgonderzoek Nederland / Medische wetenschappen (ZonMW)

Internet: www.zonmw.nl

Summary

The ZonMw organisation
The mission of ZonMw, the Netherlands Organisation for Health Research and Development, is to improve prevention, cure and care in the Netherlands by supporting and financing research, development and implementation. ZonMw is a national health council appointed by both the Ministry of Health, Welfare and Sport (VWS) and the Netherlands Organisation for Scientific Research (NWO). With an annual budget of €100 million we invest in fundamental and applied research of the highest quality. Where possible, we make sure the outcomes lead to effective practical innovations in health care and prevention.

Aim of the programme Electromagnetic Fields and Health
Scientific research into the health effects of exposure to electromagnetic fields and the impact of new technology on well-being have not kept pace with the technological developments. Scientists are therefore unable to respond adequately to the public’s questions. More and better targeted research is therefore needed in the Netherlands.

For this purpose ZonMW has developed the programme Electromagnetic Fields and Health. Aim of the programme is to substantially enhance the Dutch knowledge infrastructure in the field of electromagnetic fields (0-300 GHz) and health, giving the Netherlands its ‘own’ scientific authority in this area. The infrastructure will be set up in such a way that it makes a substantial contribution to the international research effort in this field. The aim will be to keep track of new electromagnetic field applications and to clarify some of the effects of electromagnetic fields. ZonMW takes great care in guarding the relevance, reliability, quality and independence of the research funded under the programme, irrespective of the results or the source of funding.
The Ministry of Housing, Spatial Planning and the Environment (VROM) has made this programme possible. The programme was launched in August of this year, has a duration of eight years and a budget of € 16.6 million. At this moment six different calls for grant applications are open. The deadline for application is December 15th 2006.

General conclusions

It was for the first time that a symposium was organized to study the problem of EHS from inside the group of electrosensitive people. EHS is a complex phenomenon: *Some* people suffer from *certain* electromagnetic fields (EMF) in their environment and produce *some* of the health complaints associated with activated stress syndromes. It concerns approximately 1,5% of citizens who develop chronic fatigue, concentration problems, insomnia, skin problems, tinnitus, pain in muscles and joints and some other inconveniences. EHS will never subside and the only practical remedy is to eliminate equipment and installations emitting the specifically disturbing EMFs.
Physicians and medical authorities don't usually recognize the real cause of health problems mentioned because each EHS person develops his or her own specific repertoire of disturbing EMF parameters and show individually programmed electrostress symptoms. When looking at

these people as a group, there is no obvious relation between average field strengths of EMFs and general stress symptoms. But on an individual basis there is a very strict relation, each person reveals his specific choice of disturbing EMF parameters and health effects. Given this complexity, it requires a different approach while experimenting with human volunteers. Unless clear data become available from such indispensable person-oriented experiments, a general acceptance of the EHS problem will proceed only slowly.

In experiments cited by some of the speakers (Leitgeb, Reijnders) it became clear that volunteers usually were not able to judge whether high-frequency EMFs were either or not present in experimental double-blind provocation studies in experimental settings. This lack of proper response can be taken by critics as evidence indicating that such people are not electrosensitive after all. On the contrary, it may as well be that no relevant stimuli were offered to the volunteers or that no relevant choice of answers was offered to choose from. It is rather the lack of basic knowledge that prevents us from designing the proper experiments.

Apart from the fact that much remains to be desired in designing experimental questions and approaches, the influence of human emotions is rarely taken into consideration. The sleeping experiments of Leitgeb, carried out at the people's own bedroom, represents a breakthrough in experimental approach. However, even under these conditions people who report decreased well-being caused by high-frequency EMS from GSM base stations cannot reproducibly state whether EMF-shielding curtains have - or have not- been wrapped around their beds.

One of the questions from the audience referred to the minimal group size of persons subjected to provocation experiments. Leitgeb's answer was: just one person. A single individual should allow experimentation under conditions defined by his personal preferences and reaction repertoire. To date, no such person has offered his services for the simple reason that frequently repeated exposures would make him very sick.

Present-day attention is focussed mainly on effects of high-frequency fields from GSM/UMTS base stations. Several speakers (Schooneveld, Haas, and Verheuvel) expressed the view that attention should be focussed also on fields in the homes such as those emitted by DECT telephones, WLAN and other wireless communication systems. Also low frequency fields should be considered. According to data from questionnaires, people suffering from EHS report that ordinary electrical or electronic appliances such as TV, PC, vacuum cleaners, electric (bed) heaters and blankets, alarm clocks may be disturbing. These items all emit low-frequency EMFs. People don't usually realize this due to the long incubation time between stimulus and effect. A delay of minutes to several hours or days is not unusual.

One of the requirements for work with volunteers is to ascertain that volunteers are fit for this purpose. Self-reported claims on electrosensitivity should be checked carefully and the criteria for such a check are rather 'soft', at the moment. There is presently no specific marker for EMF vulnerability. Besides, there are several other biotic and abiotic environmental factors that cause discomfort, such as allergens, odours, noise, UV light etc. All give the same array of 'vague health complaints'. Research should be directed towards elucidating key-identifiers for EHS. But first of all, test procedures must be developed to assess the 'quality' of volunteers as to responding reproducibly to applied EMFs in provocation studies.

On behalf of the Netherlands organization for health research and development. Julia van Os communicated on the fact that a budget of €16,6 million has been made available for research on possible effects of EMF on health. By December 15, research plans had to be proposed for funding. We all hope that good research projects bring some more light into questions as to which EMFs do affect what processes in the body such that so many health problems do emerge. All speakers were of the opinion that more research is needed to prevent that unnecessary harm is afflicted to people for the simple reason that signs of deleterious effects are ignored or overseen.

The audience responded with enthusiasm on the suggestion that meetings like this should be organized again in future. One of the objectives could then be to open communication with health authorities. Exchange of thoughts and experiences should help finding a common basis for

support and advice for EHS victims. These seek recognition of their problems and cooperation in attempts to improve working conditions in home or office. There is a good example in the municipality of Stockholm and some Swedish provinces. Authorities are all too eager to assist electrosensitives in making the necessary changes in accommodation which help to keep workers in good shape, regardless the exact diagnostic label of health complaints. Such a strategy should be adopted by every nation with a feeling for the needs of sensitised people.
This symposium has been made possible by a generous gift by the Dutch foundation for health and environment (PGM).

Hugo Schooneveld
E-mail: schooneveld@electroallergie.org

Postscriptum: The Powerpoint presentations of Schooneveld, Verheuvel, Haas, Reijnders and van Os van be viewed on website www.electroallergie.org of www.stichtingehs.nl.