DIFFERENT ASPECTS OF ELECTROMAGNETIC HYPERSENSITIVITY

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**Objectives**

Diseases obviously or possibly caused by environmental factors in general like Multiple-Chemical-Sensitivity (MCS)-Syndrome, Idiopathic Environmental Intolerance (IEI) or Chronic-Fatigue-Syndrome (CFS) are an increasing problem of modern industrial societies. Also the group of self-reported electromagnetically hypersensitive persons (E.H.) is growing throughout Europe and several countries world-wide. The electromagnetic fields regarded by these group to be responsible for bodily complaints are often in the very low amplitude range, typically orders of magnitude below the limits. Though interactions of strong electric and magnetic fields with living matter are well-known and authoritative restrictions are based on those interactions, the scientific evidence for the link between weak fields and clinical symptoms remains poor. The spectrum of approaches to the nature of this phenomenon is also broad. Some researchers ask if those phenomena represent a real sensitivity. Others claim a specific pattern of symptoms. A situative reaction or a behaviour caused by the media society we live in is also discussed. Our own research is committed to identify hypothetical causal links between the technically produced electromagnetic fields and sensations, clinical pictures or certain patterns of symptoms like fatigue, concentration failure, sleep disorders etc.

**Methods**

In the past years, we examined about 40 E.H. persons in our laboratory. These persons and healthy volunteers as controls are asked to describe individual subjective symptoms connected with electromagnetic exposure in their everyday life. The social situation, internal and neurological status and behaviour were adequately documented by specialists. In a provocation study, E.H. persons as well as controls were exposed two times (with a short recreation period) to a series of ten field situations. Since medical or psychological questionnaires described in literature normally do not provide sound data concerning special sensivities, we asked patients and healthy control persons (probands) to guess or even to „feel” in two consecutive sessions whether or not extremely low frequency (ELF) fields were switched on. The 50-Hz-fields were switched on or off at random on a stochastic basis ten times during one session. The probability of fields being activated was 50 %. This method is normally used in sensory physiology in order to detect subliminal sensory excitations. Additionally blood samples were taken for melatonin determination by radio-immunoassay.

**Results**

Results of the up to now approximately 40 experiments do not show significant differences in scores of groups of patients and controls. There were also no detectable correlations between scores and various parameters like patterns of symptoms, environmental factors, social positions and others. Results of narrative interviews insinuate in many cases reactions which are dominated by a special situation and intensified by mass media influences. In order to assess endocrinological parameters in terms of the melatonin hypothesis we determine plasma melatonin levels to find deviations from normal range. Preliminary results do not show significant differences of plasma melatonin levels between groups of patients and healthy controls. This negates the idea of a connection between electromagnetic hypersensitivity and the so-called „low-melatonin-people” which are known in literature.

**Discussion and Perspective**

Critical limitation of hitherto studies on self-reported electromagnetically hypersensitive persons are on the one hand a somewhat improper representation of everyday life field situations possibly leading to the complaints and on the other hand an often uncertain determination of the endpoint in matters of a medically clear diagnosis. These difficulties enable different interpretations and vulnerability of results. For future research we are planning to provide a more complex electromagnetic environment with low and high frequency components, adapted to the situation described by the E.H. persons in order to correspond to the issue of frequency selectivity reported by several persons convinced to suffer from electromagnetic hypersensitivity. The extended study design we are composing should cover also physiological measurements and subjective stated sensations of the persons under test. The aims are provocation of E.H. symptoms for scientific research reasons on the one hand and help to avoid or reduce symptoms to aid these persons on the other hand.

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