

THE NATURE OF SELF-REPORTED ELECTROMAGNETIC HYPERSENSITIVITY: IDIOPATHIC ENVIRONMENTAL INTOLERANCE OR SPECIFIC PERCEPTIVE FACULTY: AN INTERDISCIPLINARY APPROACH TO ELECTROMAGNETIC HYPERSENSITIVITY.

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Objectives:

The effects of weak electromagnetic fields (Fig. 1) on the human organism are widely known. Investigations in recent experiments couldn't reveal any effects. Prospective investigations over long time intervals cannot be done by ethical reasons. That is why several retrospective studies have been carried out during which humans suffering from unclear health problems were examined in their residential situation. An assessment of their historical field exposure of the last several years was accomplished. Even in these studies significant differences between patients and healthy control persons or between more and less field exposed persons couldn't be detected. However, the possibility could not be ruled out that certain persons (Fig. 2) react on field exposure situations more intensively than others. That is why we wondered whether a special oversensitivity to electromagnetic fields might be detected by a sophisticated method. During the eighties and later, electromagnetic hypersensitivity has continuously gained significance and caused public concern as regards threshold values of field intensities and the biological effects of electromagnetic fields. Szuba and Szmigielski contributed to this research (10). Generally speaking hypersensitivity to electricity is defined as the capacity to actually perceive electric and magnetic fields which cause bodily complaints and illnesses (6). In most cases those states of illness comprise anything from neurological disturbances to severe health problems as Leitgeb points out (5). Even neurophysiological experiments with flickering light couldn't clear up the phenomenon of electromagnetic hypersensitivity sufficiently (9). Our own approach to the subject is based on the following hypothetical assumptions formulated by David, Fachner, Kentner and Reißerweber (1, 2, 3, 4, 7, 8): 1. Hypersensitivity to electricity is an attempt to explain certain symptoms which have caused considerable pain in the person concerned, while all medical treatments hitherto employed, have failed. 2. The complaints of the patients are similar to the symptoms which are described in the literature and the media as being typical for hypersensitivity to electricity. They might thus serve as an explanatory means. 3. Hypersensitivity to electricity is an allergic reaction to electric and magnetic stimulation. Environmental factors may have a chemical

impact on the person involved and thus may reinforce the potential for the perception of electric and magnetic fields.

Methods:

Studies asking probands directly if they can feel an electromagnetic field normally didn't provide satisfying results. Therefore we tried to elucidate unconscious influences in a statistical manner by exposing persons who are convinced to suffer from electromagnetic hypersensitivity to a series of field situations. Those persons were then asked to guess the existence or non-existence of field exposures and to write them down. The guess probabilities of each person were then correlated with the symptoms they reported about hoping that we could find a positive or negative correlation. A positive correlation would speak in favour of a general idiopathic environmental intolerance (IEI) presenting a lot of symptoms a part of which could be electromagnetic hypersensitivity. This is current opinion in the U. S. A negative correlation would speak in favour of a selective perceptive faculty in regard of electromagnetic fields independent from other effects. Each of the 24 persons suffering from electromagnetic hypersensitivity was exposed to a stochastic sequence of time intervals with or without magnetic field exposure situation (frequency: 50 Hz sinusoidal field; flux density: 10 microtesla; duration: 2 minutes) in a chamber shielded from electromagnetic influences. 24 healthy control persons underwent the same procedure. Probands had to guess if fields were switched on or off.

So 24 patients who are convinced that they do in fact strongly react to electricity as well as a similar number of the control group were confronted with the following experiment: After relevant information on personal living conditions, housing conditions and an anamnesis was obtained in each individual case, the patients were exposed to a magnetic field of 10 μ T at a frequency of 50 Hz, generated by a coil. The magnetic field was activated for 2 minutes or deactivated, i.e. the succession of the intervals was determined on a stochastic basis and generated by a computer programme. Hereafter the patients were informed that the electromagnetic field was shut off for another 3 minutes. After that they were confronted once more with the possibility that the electromagnetic field might be activated. The probability of the electromagnetic field being activated was 50 % by means of a calculatory computer program. These phases were continued until a total time of 65 minutes was reached. While being confronted with the possibility that the electromagnetic field is switched on the proband was invited to talk about his perceptions or fill in a form serving as a scale, which had been prepared for that purpose. He was asked to give his opinion on whether the electromagnetic field had been switched on or not. On the basis of the information obtained, the score could be deduced for each single person (Fig. 3). This test procedure was carried out twice. Since the results of

the experiment do not provide enough validity as such, the investigation was complemented by a short internal and neurological examination, an anamnesis, a questionnaire concerning the symptoms felt as well as another one concerned with the individual's opinions on health and illness to preclude hypochondriac tendencies. Additionally, the patients were invited to talk about their personal living conditions in an open atmosphere.

Preliminary results:

More women than men participated in the experiment (in total 17 women and 7 men).

The results scored in the double-blind trial were as follows: In the two tests 15 patients scored more than 50% in either one of the two tests, but these results cannot claim major significance. Also the result of a control group cannot claim significance.

The symptoms most frequently named, referred to
exhaustion (22 cases, 92%)
sleep disorders (18 cases, 75%)
concentration failure (16 c., 67%)
allergies (15 c., 63%)
back pains (14, 58%)
headache (13 c., 54%)
feeling of inner pressure (13 c., 54%)
crawling sensations (10 c. 42%)
depression (10 c., 42%)
cardiac pains (6 c., 25%)
hypertension (4 c., 25%)
IEI (Idiopathic environmental intolerances 6 cases, 25%.)

Most of the persons were aged between 42 and 55.

On account of their symptoms 8 patients can only work in part-time employments or are not able to attend to work regularly. (33%). 4 patients are not able of carrying out any work at all. They are pensioners. 4 patients suffer from mobbing or from too high demands on the job.

5 patients suffer from a burn-out syndrom as a result of a long medical history.

Discussion:

It is remarkable that 15 patients suffer from allergies, dental metals or prothesis dental, certain food ingredients, pollinosis, nickel, plastics, palladium, aspergillois.

With 7 probands increased levels of mercury, PCB, PCP, lindan, cadmium or formaldehyde could be stated. 10 patients had a removal of amalgame done, which relieved their symptoms. 10 others stated that they suffered from depression and only one patient of these group had received psychological assistance. Only 4 patients asked for psychological assistance and 12 seeked help by a building expert's assistance but no one has had a longer psychological treatment. 6 are classified as IEI. They are convinced that being intoxicated by chemicals, they are inclined to electromagnetic hypersensitivity. The internal and neurological examination didn't give significant results either.

Electromagnetic hypersensitivity should then be regarded as an environmental illness. Currently throughout Germany there exists an increasing awareness (Fig. 4) of health problems being caused by environmental factors. Since illnesses which are due to the environment, have only recently received more attention in medical science, there is only limited knowledge in this field.

This lack of knowledge and the consequent insecurity may lead to projections as to the environment and its role in promoting illnesses. Projections are fostered both by the patients concerned and a society which is used to receiving clear diagnosis and therapies.

The patients feel that they are left alone with the symptoms they suffer from, since medical science does not provide the exact treatment that they would expect from a professional doctor. If an organical diagnosis cannot be made, patients will usually not receive medical treatment at all.

It is remarkable that nearly all patients accept this conception of illness. Hence they tend to emphasize a duality of body and psyche. Psychological determinators and socially relevant hardships are generally not accepted as causal determinators. They believe that one external factor is the cause of their complaints and are disappointed that there is no organical diagnosis. They think that psychological knowledge is prematurely applied to their case, and that, thus, their real suffering is not taken seriously.

Many patients have developed a strong psychosomatic tendency. They tend to attribute their symptoms to certain situations. This, in turn, will lead to the fact that the symptoms are stabilized. In the case of our patients, their perceptions and sensations are extremely focused on electromagnetic fields. These cognitive causal links (an external factor is regarded as the cause of the illness) belong to the field of psychosomatics:

Electric current is everywhere and consequently the own body is selected as a location of symptoms, which will help to psychically stabilize the individual, when no adequate protection and no prescriptions against the manifold pressures and demands of society can be found.

The person who defines himself as hypersensitive has nearly the same symptoms as patients with hypochondriac tendencies.

A validated questionnaire showed, however, that there are no significant results which would prove, that these patients tend to hypochondria.

The hypothesis that a proneness to hypersensitivity to electricity is due to allergies or toxical substances in the environment has to be substantiated as yet.

Summary:

Results were evaluated and did't reveal clear differences (Fig. 5) between hit frequencies (scores) of groups of electromagnetically hypersensitive persons and healthy control persons. Correlations between hit frequencies and most frequently mentioned symptoms like exhaustion, concentration failure, headache, allergies, feeling of inner pressure and so on could not be found either (Figg. 3 and 6).

The symptoms most frequently named, referred to exhaustion (22 cases), sleep disorders (18 c.), concentration failure (16 c.), allergies (15 c.), headache (13 c.), feeling of oppression (13 c.), crawling sensations (10 c.), depression (10 c.), cardiac pains (6 c.), hypertension (4 c.) and IEI (Idiopathic Environmental Intolerances, 6 c.). On account of their symptoms 8 patients can only have part-time jobs or are not able to attend to work regularly (33%). 4 patients are not capable of carrying out any work at all. They are pensioners. 4 patients suffer from mobbing or from too high demands on the job. It is remarkable that 15 patients suffer from allergies, dental metals or dental protheses, certain food ingredients, pollinosis, nickel, plastics, palladium, aspergillosis. With 7 patients increased levels of mercury, palladium, PCB, PCP, lindan, cadmium or formaldehyde could be stated. 10 patients had a removal of amalgame done, which relieved their symptoms. 10 others stated that they suffered from depression, and only one patient of these group had received psychological assistance. 6 are classified as IEI. They are convinced that being intoxicated by chemicals, they are inclined to hypersensitivity to electricity. In the two tests that were carried out, 18 patients scored more than 50% in either one of them, but these results cannot claim major significance, compared with the control group.

Conclusions:

Regarding the small number of persons integrated into the study the conclusion of the evidence of an electromagnetic hypersensitivity independent from symptoms is not yet possible. Even if a slight tendency towards the above mentioned negative correlation may be observed.

Patients who are convinced that they are hypersensitive to electricity do not have a history of psychiatric illness and do not meet criteria for diagnosis used in psychiatry. It is remarkable that all patients attempt to find a cause which would explain their symptoms and have tested several traditional methods which regard to their efficiency. Most of them are disappointed and refuse to accept definitions of illness used by formal medicine. They tend to emphasize a duality of body and psyche and wish that one single cause be at the root of their problems. Psychological determinators and socially relevant hardships (Fig. 7) are generally not accepted. It is thought that a premature recurrence to psychiatric knowledge for the explanation of psycho-social conflicts is too often done, and that, consequently, the real burden of suffering is not taken seriously. The hypothesis that a proneness to hypersensitivity to electricity is due to allergies or toxical substances in the environment has to be substantiated as yet. We are indebted to Mrs. D. Klunker and Mrs. F. Gholamrezaei for excellent technical assistance.

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