

Experience of Polish Physicians on Electromagnetic Hypersensitivity

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Abstract—The aim of this project was to assess the knowledge of Polish physicians about the impact of electromagnetic fields (EMF) on human health, their knowledge of electromagnetic hypersensitivity (EHS), and their experiences with patients who consider themselves hypersensitive to EMF. A questionnaire survey was conducted among physicians in a traditional paper-based format, as well as using an online form. Responses were obtained from 355 doctors of various specialties and with different levels of experience, both clinical and scientific. A subjective and objective assessment of the respondents' knowledge about the impact of EMF on humans leads to the disturbing conclusion that their knowledge cannot be considered broad. For example, the subjective self-assessment of knowledge in 1/3 of the respondents is at a very low or low level. Physicians do not seem to be familiar with the WHO guidelines for dealing with people who perceive themselves as hypersensitive to EMF. Respondents are aware of the low level of their knowledge about EMF and most of them are ready to improve their qualifications in this field. They also see the need to spread reliable knowledge about the EMF and its impact on society. The low assessment of doctors' knowledge of EMF and EHS is even more concerning as EHS is a phenomenon many encounter in their daily professional practice. Almost 45% of physicians declared that they had to deal with patients who associated their symptoms with the impact of EMF, and some physicians claim that they deal with such patients even several times a month or more often. These findings may lead to significant for public health conclusions. EHS is not a marginal phenomenon, and physicians are striving to properly address this condition. At the same time, their knowledge about EHS and about EMF in general is limited. In such cases, they are unable to adequately help their patients and may become a source of unreliable or unverified information, which could lead to anxiety.

Keywords—*idiopathic environmental intolerance attributed to electromagnetic fields, electromagnetic hypersensitivity, non-ionizing radiation, electromagnetic fields*

I. INTRODUCTION

One of the health aspects related to the impact of non-ionizing electromagnetic fields (EMF) on the human body is "electromagnetic hypersensitivity" (EHS), formally

referred to as Idiopathic Environmental Intolerance attributed to Electromagnetic Field [1]. This phenomenon relates to individuals who associate their symptoms with low levels of electromagnetic field intensity of various origins. Qualification of people as hypersensitive to EMF (EHS+) is based on an interview and self-definition as a sensitive person. EHS is characterized by a wide spectrum of non-specific symptoms that EHS+ people attribute to the impact of EMF and associate with great variety of devices generating these fields [2]. Therefore, EHS cannot be assigned to a well-defined frequency range of non-ionizing EMF. These can be both constant and slow-changing electric and magnetic fields, as well as fields from radio ranges.

Since 2016, our team has been conducting research related to the impact of EMF on human health. One of the areas of interest is EHS, particularly the issue of estimating the prevalence of this condition in our country [3,4,5]. Several studies were conducted to assess the scale of this phenomenon and to identify the characteristics of EHS+ individuals in Poland. Taking into consideration the characteristics of this condition, a new criterion for qualifying respondents to the EHS+ group, was also proposed. It should be qualified for people who experience symptoms related to the operation of the field in situations where such symptoms are not experienced by others. Symptoms of hypersensitivity, on the other hand, should be strong and troublesome enough to motivate the patient to actively seek professional help in solving this health problem. A form of such active search can be, for example, a consultation with a doctor.

Our studies showed that approximately 1-2% of population in Poland meet the criteria defined in this way. This raises the question of what the EHS issue looks like from the perspective of doctors. Do Polish doctors have knowledge about EHS and do they meet with EHS+ people in their daily practice? The aim of the project was to study the experiences of Polish doctors with EHS+ patients, as well as to examine their knowledge of EHS.

II. MATERIALS AND METHODS

The study was conducted in the form of an anonymous survey, which was distributed in two ways: in the form of a Google form available online and in a paper-based format. The questionnaire contained 18 questions with the first 6 designed to determine participant's characteristics. Most of the inquiries were in the form of closed questions, in some defining an additional answer was possible. In the case of questions that were aimed at determining respondent's opinion on a specific topic, a five-point Likert scale was used.

The aim of the study was to assess the experience of Polish physicians with EHS+ patients and their opinions on EHS, as well as on the impact of EMF on health. The questions asked also aimed to characterize the patient population that the surveyed doctors dealt with in terms of the observed symptoms and the devices associated with their development. In addition, a request was made for self-assessment of the respondents' knowledge of EMF.

The study group was selected opportunistically. The research was conducted mainly in academic centers such as the Jagiellonian University, but some of the data was obtained during a large nationwide conference of family doctors, some was collected using an online form and information about the exact place of residence and work of the respondents was not available. The study group was not representative of Polish doctors or any specific part of this community, which is undoubtedly a methodological limitation.

The survey included 355 doctors with 229 questionnaires (64.5%) completed traditionally, and the remaining 126 (35.5%) completed online using a Google form. The majority of the respondents were women (205, 57.7%).

Regarding respondents' specialties, the most numerous were doctors during their specialization (32.0%), specialists with one specialty and more than 15 years of experience after obtaining it (22.0%), and physicians with more than one specialty and more than fifteen years of experience after obtaining their first specialty (20.0%). Therefore, it can be said that doctors with varying levels of professional experience took part in the study. The most common specialties were family medicine (26.2%), internal medicine (15.8%) and neurology (5.6%).

The experience in scientific work described by academic title was also diverse. Most of the respondents held the professional title of medical doctor (72.0%), and almost 20% had a doctoral degree in the discipline of medical sciences; 2.8% of responders had higher degrees. The survey was completed also by associate professors (2.5%) and full professors (2.0%). In relation to the population of Polish doctors, individuals with academic degrees were overrepresented in the study group since the study was conducted mainly in an academic center. This fact can be a potential source of errors in the interpretation of obtained data. The same applies to the category of the respondents' workplace. Almost 60% of participants declared their place of professional practice as an urban center with a population of over 500 thousand.

III. RESULTS

The respondents were asked to subjectively assess their knowledge about the impact of EMF on health (Fig. 1). The respondents were divided almost perfectly into three equal parts. A third of the respondents considered their knowledge about the impact of EMF on health to be insufficient, including about 9% who assessed it very negatively. On the other hand, 1/3 of the participants assessed the state of their knowledge positively, but the percentage of people declaring it as high was close to 5%. Leaving aside the question whether the subjective assessment of doctors' knowledge about the impact of EMF reflects their real knowledge, the results obtained are concerning, taking into account that the problem of EHS is a real issue for Polish doctors, which has been shown by the analysis of subsequent results.

The respondents were aware that the low level of knowledge about EMF is a considerable problem, and they saw the need to increase knowledge about the impact of EMF on health both among the general public and medical professionals. Almost 3/4 of the respondents believed that programs to broaden the knowledge of the society in this field should be implemented, and more than half of the respondents would like to take part in training on this subject (data not presented here as a plot).

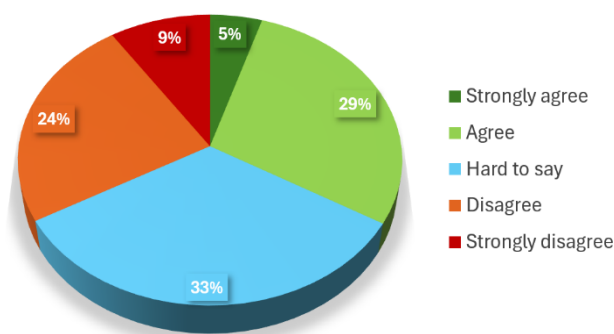


Fig. 1. Subjective assessment of the respondents' knowledge about the impact of magnetic fields on health. Assessment of the statement "I believe that I have sufficient knowledge about the influence of electromagnetic fields on health".

In another question, the respondents were asked to assess whether EMF in the radio frequency range (used e.g. by mobile phones, radio, Wi-Fi routers) with an intensity that meets generally accepted standards could have a negative impact on health. According to the current state of knowledge, low-intensity EMF does not adversely affect the human body. This assumption allows to set safe current limits for electrotechnical devices. Positive answers to this question may therefore indicate a low level respondents' knowledge about the impact of EMF on health. A summary of the answers given to the above-mentioned question is presented in Fig. 2. Almost half of the respondents, 46.0%, did not believe that EMF at low levels (considered safe) has a negative impact on human health, but quite a large percentage, almost 1/3 of respondents, claimed that this impact is negative.

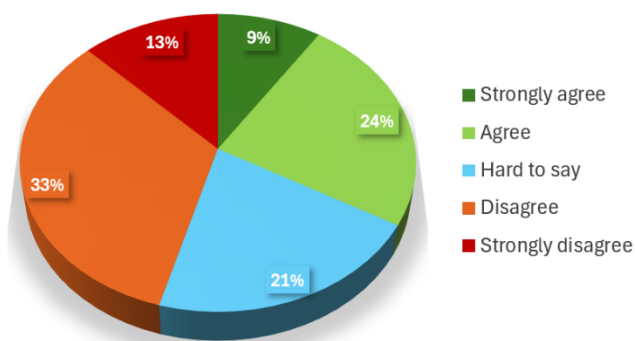


Fig. 2. Results for the question: "Please rate the statement: "Electromagnetic fields in the radio frequency range (used e.g. by mobile phones, radio, Wi-Fi routers) with an intensity that meets generally accepted standards may have a negative impact on health"."

Respondents were also asked for their opinion whether the symptoms attributed to the exposure to electromagnetic fields have a psychosomatic basis (Fig. 3). The psychosomatic basis of EHS is one of the postulated mechanisms, because the true mechanism of this phenomenon is unknown, therefore it is impossible to assess what kind of statements are true in this matter. Almost half of the respondents saw the mechanism of EMF hypersensitivity in psychosomatic phenomena, and only 1/4 of the participants were of the opposite opinion.

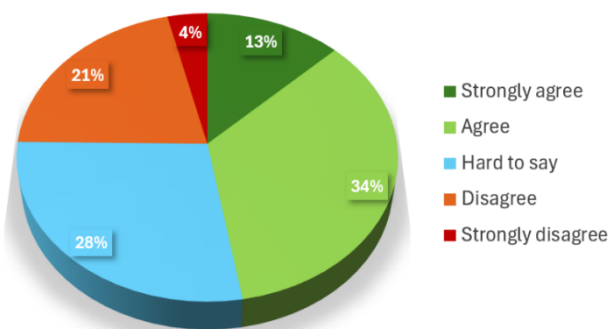


Fig. 3. Results for the question about the psychosomatic mechanism underlying the symptoms associated with the effects of EMF on the human body: "Evaluate the statement: Symptoms attributed to the impact of electromagnetic fields have a psychosomatic basis."

The most important objective of the study was to learn about the experiences of the medical community with people who associate their symptoms with the impact of the electromagnetic field present in the environment on their health. Therefore, the respondents were asked to specify how often they have to deal with patients who attribute their health symptoms to EMF during medical consultations (Fig. 4). Over half of the respondents had never dealt with this type of patient. Slightly more than 1/4 dealt with them very rarely, less than once a year. On the other hand, a small group of respondents estimated this frequency at the level of several consultations of this type per month or more often.

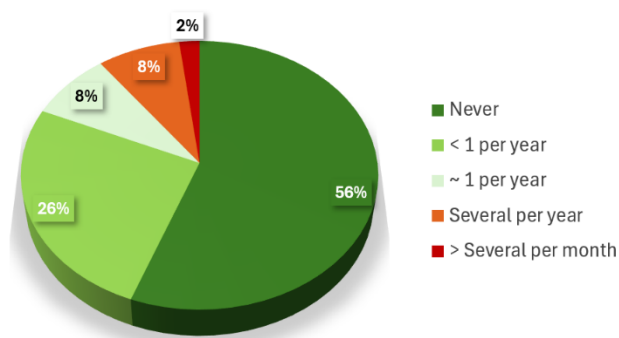


Fig. 4. Results for the question about the frequency of consultation of patients who associate their symptoms with the impact of EMF on their health. Answers to the question: "How often do you consult patients with electromagnetic hypersensitivity?"

Subsequent analyses took into account the answers of only those respondents who stated that they encountered patients sensitive to EMF. There were 157 such people, which constituted 44% of all respondents. The respondents who claimed that they were dealing with hypersensitive patients also tried to estimate the percentage of people who were consulted on issues related to the impact of EMF on their health. The results are shown in Fig. 5.

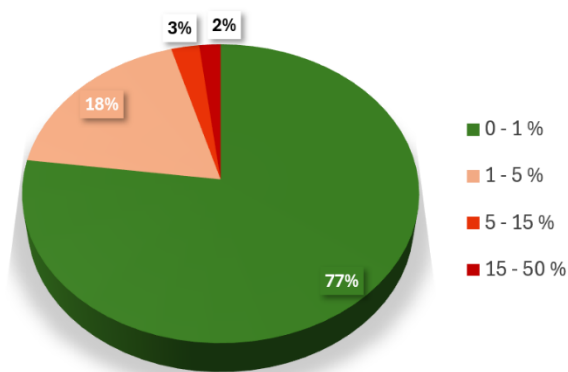


Fig. 5. Results of the assessment of the percentage of patients hypersensitive to EMF in relation to the total number of their patients. The question was formulated as follows: "What percentage of your patients have such health symptoms attributed to electromagnetic fields". The respondents chose one of the following answers: "0-1%", "1-5%", "5-15%", "15-50%" and "50-100%". The percentages in the graph refer to the number of physicians (157) who declared that they were dealing with EMF-sensitive patients.

The vast majority estimated the percentage of such patients to be less than 1%. Surprisingly, about 3% of responders estimated the prevalence of EHS patients for 1-5% and almost 2% of the respondents estimated their percentage in the range of 15-50%, but fortunately, no one chose the last answer, i.e. "50-100%". It should be clearly noted here that it was an intentional choice that only the first two scopes that the respondents had to choose from were realistic. If we assume that a Polish doctor sees 30 patients a day, then with an EHS percentage of 5%, he would have to deal with an average of one or two such patients every day. A percentage of 15% would suggest the number to be four or five per day.

IV. DISCUSSION AND CONCLUSION

The idea of researching the opinions and experiences of doctors on hypersensitivity is not new, as similar studies have been conducted in other countries [6,7,8]. The cited reports were written relatively long ago, and to the authors' knowledge, it is difficult to find more up-to-date studies on similar topics. According to the authors' knowledge, similar studies have not been conducted in Poland so far. The conclusions that may be drawn from the described project are consistent with previous results from other countries.

First, a significant number of doctors participating in the studies had to deal with patients who described themselves as hypersensitive to fields (Berg-Beckhof – ~61%, Leitgeb – ~66%). Although the study by Slottje et al. [8] shows that only about 1/3 of the surveyed family doctors, occupational medicine physicians and hygienists declare this type of experience, according to other reports cited [8], the percentage of European doctors who encountered individuals with EHS was approximately 68-75%. In the group of surveyed doctors in the described study, 44.2% of the respondents deal with this type of patients, and 10.2% declare that they encounter such patients relatively often.

The vast majority of the surveyed physicians to some extent or completely believed in the important role of environmental EMF for health, while the answers given by physicians in the questionnaires also revealed their poor knowledge of the properties of EMF and the risks associated with it. The majority of respondents subjectively declared insufficient knowledge about EMF and its impact on people, at the same time expressing the need and readiness to deepen this knowledge.

A disturbing conclusion from the above-cited papers is that physicians often discuss the alleged health risks associated with EMF with consulted patients, but their recommendations are very often not based on scientific evidence, while at the same time, can have serious consequences for the lives of patients. When consulting patients affected by EHS, doctors most often recommend lowering exposure, which is contrary to WHO guidelines. This included, for example, eliminating electrotechnical devices from the patient's environment or avoiding places that seem to be at risk of higher exposure to EMF. The authors of one paper [6] comment that it is quite remarkable that there is such a widespread contradiction between the opinions and conduct of physicians and the established international assessment of EMF health risks, especially since physicians deal with the problem of EHS quite often, according to their own declarations.

The international risk assessment of EMF on health and its relationship with EHS is described in documents published by the WHO [1], which include suggestions for doctors on how they should approach patients declaring EHS. Treatment of individuals affected by EHS should focus on health symptoms and clinical picture, rather than on the patient's perceived need to reduce EMF exposure or eliminate it from the environment. Any specific medical conditions that may be responsible for the reported symptoms should be identified and treated first. Subsequently, a psychological assessment should be considered to identify alternative psychiatric/psychological conditions that may cause the symptoms. An assessment of the place of work and residence should be undertaken in

terms of all other factors that may contribute to the onset of symptoms. The proper course of action may be to reduce stress and to improve work conditions.

For people with EHS with long-term symptoms and severe health consequences, therapy should be aimed at reducing symptoms and functional limitations. The procedure should be aimed at developing strategies for coping with the situation and encouraging patients to return to work and lead a normal social life.

Physicians' knowledge about the impact of EMF on human health, determined by themselves, is not sufficient. Only 1/3 of the respondents describe it as high or very high, with only one in 20 participants assessing their knowledge as very high, while one in 10 – as very low. It is reasonable to question whether the current knowledge of physicians in the face of the growing number of telecommunication and electrotechnical devices in the human environment and growing social concerns related to the exposure to EMF is sufficient. Notably, it is the medical community that has great potential in shaping attitudes and views on the impact and risks associated with the influence of EMF on health.

A study of doctors' experiences with people who associate their health concerns with the impact of EMF may lead to cautious conclusions that the community of Polish doctors is facing this problem, though it may not be as frequent as alarmist reports of some circles and media may report. It should be emphasized that the conclusions formulated based on this questionnaire survey must be formulated with caution due to the non-representativeness of the surveyed group.

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