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Electromagnetic hypersensitive Finns: Symptoms, perceived sources and treatments, a questionnaire study

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Abstract

The aim was to analyze the subjective experiences of Finns who describe themselves as suffering from electromagnetic hypersensitivity (EHS), their symptoms, self-perceived sources of the health complaints and the effectiveness of medical and complementary alternative therapies. A total of 395 questionnaires were mailed to self-diagnosed EHS persons. Of the participants 345 belonged to a Finnish self-help group and 50 came from outside of the group. The return rate of the study was 52.1% (206) and 80.9% of the respondents were women. Before the onset of EHS the most common health complaints were different types of allergies (35.1%, 68). During the acute phase of EHS the most common symptoms were nervous system related: "stress" (60.3%, 117), "sleeping disorders" (59.3%, 115) and "fatigue" (57.2%, 111). The sources that were most often reported to have triggered EHS were: "personal computers" (50.8%, 94) and "mobile phones" (47.0%, 87). The same devices were also claimed to cause the most symptoms during the acute phase. After the acute phase of EHS had passed, the respondents still claimed to react to these same digital and wireless devices while their reactions to basic electrical appliances were reduced. According to 76% of 157 respondents the reduction or avoidance of electromagnetic fields (EMF) helped in their full or partial recovery. The best treatments for EHS were given as: "dietary change" (69.4%), "nutritional supplements" (67.8%) and "increased physical exercise" (61.6%). The official treatment recommendations of psychotherapy (2.6%) and medication (−4.2%) were not significantly helpful. According to the present results the official treatment protocols should take better account the EHS person's own experiences. The avoidance of electromagnetic radiation and fields effectively removed or lessened the symptoms in EHS persons.

Keywords: Electromagnetic hypersensitivity (EHS); Electromagnetic fields (EMF); Questionnaire study; Symptoms; Diet; Antioxidants; Supplements; Psychotherapy; Complementary alternative (CAM) therapies

1. Introduction

According to World Health Organization (WHO) electromagnetic hypersensitivity (EHS) manifests as a variety of non-specific symptoms and differs between individuals. WHO does not consider EHS as a medical diagnosis and the collection of symptoms is not associated with any known syndrome. The most common symptoms associated with EHS are dermatological, neurasthenic and vegetative symptoms. For long-lasting symptoms WHO recommends therapy for persons suffering from EHS and also notes that physicians should not be overly concerned about the reduction of electromagnetic fields (EMF) based on the individual's requests [1]. In Finland the officially recommended treatment for EHS is psychotherapy [2].

Previous studies have typically focused on population based surveys and the prevalence of EHS has been estimated at 1.5% in Sweden [3], 5% in Switzerland [4], 3.2% in California [5], 3.5% in Austria [6] and 4% in the UK [7]. In Taiwan the prevalence of EHS in the general population has been estimated at a surprisingly high percentage, 13.3% [8]. It has been suggested in the research literature that different ethnicities may have variable EHS risk [5].

For this study the prevalence of EHS in the general population was not addressed nor was the study group compared to the general population. This study did not seek to prove a causal relationship between EHS symptoms and electromagnetic field exposure (EMF).

Our study aim was to analyze the subjective reported experiences of Finnish people who describe themselves as

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suffering from EHS as there have been no previous studies about EHS symptoms and treatments in Finland. Similar studies have already been made in Switzerland (2004) [9] and Japan (2012) [10]. The questionnaire was designed to find answers to three main questions about the participants and their EHS related symptoms: the types of symptoms, the self-perceived sources for their symptoms, and the scope and effectiveness of different kinds of medical care and complementary alternative medicine (CAM) therapies.

2. Subjects and methods

The questionnaire was designed to survey EHS related health complaints, the environments and electrical equipments the subjects associated with their symptoms and the efficacy of medical or alternative remedies in subjects who had sought to get help in their symptoms.

In March 2011 a pilot questionnaire was arranged and mailed to 50 participants in order to test the questionnaire material for unforeseen omissions or problems in the phrasing of questions. Out of the 50 participants 23 returned their questionnaire i.e. the return rate was 46%. The returned material was helpful and minor adjustments were made to the questions.

The adopted questionnaire was mailed to the participants between July 2011 and January 2012. Initially the participants were selected from the membership registry of a self-help group, but later approximately 50 additional people claiming to suffer from EHS, but not directly involved with the self-help group who had heard of the study by word of mouth and asked to participate in the study. The questionnaire forms were sent to all who requested it. In total 395 forms were mailed and the return rate was 52.1% as 206 returned questionnaires. In this group 12 forms were disqualified from the study due to either being inadequately filled or the respondent did to not suffer from EHS themselves.

Out of the 194 valid responses 80.9% (157) were from women and 19.1% (37) were from men. The average age of the respondents was 55.4 years (27–98). The percentages of age-groups were (20–29) 1.1%, (30–39) 13.4%, (40–49) 19.9%, (50–59) 22.0%, (60–69) 29.0%, (70–79) 13.4% and 1.1% in age group (80–99) (Fig. 1).

In previous studies EHS symptoms have been typically related to skin conditions of the face and chest and various neurovegetative symptoms [11,12]. In the present study a list of 68 varied health complaints were reported. In addition to the typical EHS symptoms the list also included many generic health symptoms, which are generally not associated with EHS. The symptoms were grouped into 10 different categories. Symptoms of the nervous system, dermatological symptoms, symptoms generally located around the head as eye and ear symptoms, symptoms of the mouth, heart and lung symptoms, symptoms of the airways, muscle and joint symptoms and other problems.

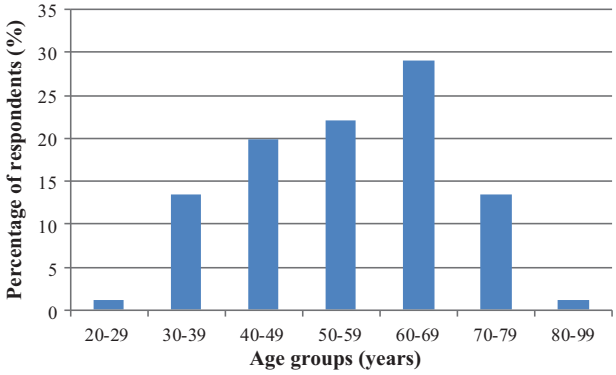

Fig. 1. Age distribution of respondents ($n = 186$).

The participants were requested to answer to which phase of EHS the symptoms were related. The questions were given as multiple choices for each symptom. The possible answers were 'none', 'before the onset of EHS', 'during the acute phase of EHS' and 'currently persisting'. The frequency and severity of the symptoms was not assessed further in the questionnaire. The concept of the acute phase of EHS exists in some member questionnaires of self-help groups [13] but is seldom found in peer-reviewed literature. In practice we have interviewed many people who have described to having experienced an 'acute phase' in their EHS syndrome. In this study we wanted to use this definition in order to analyze symptoms and reactions to different sources EMFs at different stages of EHS.

The questionnaire included two questions about the electrical devices and sources associated with the EHS symptoms. An open question asked which devices or sources they first associated with the onset of health complaints. It was followed by a multiple selection question with a list of 50 typical electrical home appliances (vacuum cleaners, electrical heating elements, refrigerators), electronic devices (personal computers, flatscreen TVs, compact fluorescent lights) wireless devices (mobile phones, wireless internet routers, mobile phone base station towers) and other types of commonplace electromagnetic emission sources. The answer options were about the perceived sources for symptoms during the different phases of the progression of EHS: none, before the emergence of EHS, during the acute phase of EHS or still persisting.

The perceived efficacy of medical and complementary alternative treatments in regards to EHS was evaluated by a multiple choice question. The medical treatments included: psychotherapy, medications, removal of dental amalgam fillings, dietary changes, vitamin B12 and other supplements, increased physical exercise. The CAM treatments included: natural dietary supplements, solarium, acupuncture, chiropractic/naprapathy/osteopathy, traditional bone setting therapy, physiotherapy, homeopathy, reflexology, shiatsu. Participants were given the answering choices 'Helped considerably', 'Helped somewhat', 'No effect' and 'Worsened the situation'. These were respectively given weighing