

SENSITIVITY TO NON-IONISING RADIATION IN IRELAND

Abstract

Over the last more than 20 years, accounts of individual's apparent sensitivity to electromagnetic radiation (EMR) have been published in several countries. Studies in these different jurisdictions have estimated the prevalence of this condition to be between 1 and 5% in the general population. Recent research in Sweden has found that the number of people reporting symptoms that they associated with this sensitivity has been rising rapidly. In Ireland, the number of people who describe themselves as sensitive to radiation from mobile telephone base stations, mobile telephones and other electromagnetic appliances has also been increasing. These individuals report experiencing a range of symptoms when they are exposed to such radiation. These symptoms can vary from mild to severe and some can be extremely debilitating. A possible explanation is that people who are affected in this way have a physiological sensitivity to environmental stressors such as EMR.

The Irish Doctors Environmental Association (IDEA) is a group of doctors and other health professionals who wish to highlight possible links between changes in the environment and health. To this end, IDEA undertook a descriptive study of 16 people in Ireland who appeared to be sensitive to exposure to EMR. The study involved applying a structured questionnaire to a self-selected group of individuals who experienced symptoms that they related to exposure to electromagnetic radiation. The participants were then examined by a doctor and a range of laboratory investigations was conducted on them.

While the findings on physical examination and from the laboratory tests did not establish any common abnormalities among the participants, the results of the questionnaire did demonstrate the debilitating nature of this syndrome. The main outcome of the study was to emphasize the importance of looking further at the nature and etiology of the sensitivity that was described.

This study was funded by the Eithne Naylor legacy, which is gratefully acknowledged.

Irish Doctors' Environmental Association (IDEA).

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Introduction:

The health effects of electromagnetic radiation (EMR) have long been of interest. Electromagnetic radiation includes electromagnetic fields (EMF) and electromagnetic radiation, infrared and optical radiation, and ionizing radiation. National and international guidelines exist to limit exposure to these types of radiation and to protect individuals from the possible hazards of exposure to them, both in the short and the long-term.

Electromagnetic radiation is produced power lines, mobile telephones, by the base stations for those phones and by other commonly used electrical appliances. Apparent sensitivity to exposure to the non-ionizing electromagnetic radiation produced has been reported in certain individuals in many countries. Studies in these different countries have estimated the prevalence of this sensitivity to be between 1 and 5%. In Ireland, an increasing number of people have reported a variety of symptoms of varying severity that appear to be related to exposure to EMR.

The Irish Doctors' Environmental Association (IDEA) is a group of medical doctors and allied health professionals who are interested in investigating and highlighting possible links between the environment and our health. The organisation recognises the existence of a group of people who appear to be sensitive

to EMR and decided to undertake a descriptive study of the symptoms experienced by these people in Ireland.

Method:

A self-selected group of individuals who all believe that they are sensitive to electromagnetic radiation was identified from the membership of the Irish Electromagnetic Radiation Victims Network (IERVN), a self-help group who are lobbying to increase awareness of this problem. The members who agreed to participate in the study were subjected to an interviewer-applied structured questionnaire, the answers to which were written down by the questioner, who was an experienced nurse. The interviews were also tape-recorded for quality control and to allow the answers to be reviewed. A general physical examination was then conducted by a medical doctor. Subsequently, where the participant's family doctor was agreeable, a range of blood tests was arranged which included a full blood count, a white cell count, an ESR, liver function tests, serum urea and electrolytes, a test for Brucellosis and serum proteins.

Results:

Ten women and six men participated in the study. Their ages ranged from 26 to 74 years at the time of the study, giving an average age of 50.1 years. Half of the participants were married and another quarter had previously been married, including one who was widowed. They had a range of occupations including builder, salesperson, teacher, civil servant, accountant, manager and businessperson. Just over one quarter were currently still able to work, while half attributed their inability to work to the severity of the symptoms they were experiencing. There were no trends or commonalities in their family histories, though those who were currently in relationships all reported that their partner's health was good.

A majority of the participants (13 out of 16) gave a history of one or more significant physical diseases: 5 of the respondents had diabetes; 7 had hypertension; 8 had had a cancer; 4 had asthma; 4 had eczema; and 6 gave a history of allergies. In addition, 6 of the respondents reported suffering from anxiety and 3 suffered from depression. Ten participants took regular medication.

Despite the level of serious illness among the participants, half of the participants reported that their current health was good, with no other health problems apart from the symptoms arising from exposure to electromagnetic radiation.

Thirteen of the participants experienced a similar pattern of symptoms, though of varying severity. They reported experiencing a range of symptoms, which they mostly related to exposure to electromagnetic radiation. Three quarters (12) of the participants reported that, when they were affected, they experienced sensory changes as a result of their presumed sensitivity. Other common symptoms that were reported included becoming fatigued (14), becoming increasingly lethargic (12), becoming increasingly clumsy (14), experiencing confusion (11), experiencing paraesthesia (tingling) (12), experiencing buzzing (13) and feeling dizzy. Ten of the participants reported experiencing temperature changes, becoming hotter or colder when they were affected. More than half of those interviewed had symptoms of an affective disorder with low mood, mood swings, difficulty sleeping, dreams and tearfulness. Fourteen of the participants felt that a change of location helped to relieve their symptoms and seven felt that rest helped. Twelve participants felt that their symptoms had got worse over time.

The participants related their symptoms to exposure to sources of electromagnetic radiation, most commonly to proximity to mobile telephone base stations, to mobile telephones or to power lines. Fourteen of the respondents felt that their symptoms got worse on increasing exposure to sources of EMR, that is increasing proximity.

The quality of life for all of those who participated in the study was generally rated as poor. Half were unable to work and all had a very restricted social life, being unable to easily go out and feeling that they were 'prisoners' in their own home, even though for most their home environment was extremely uncomfortable.

The physical examination and laboratory investigations revealed no consistent abnormalities. The majority of the test results were within the normal range with only an occasional abnormal result, which could generally be explained by pre-existing conditions.

Discussion:

There are many experiments which have demonstrated that electromagnetic radiation and electromagnetic fields have physical effects on living tissues. Initially concern focused on the possible thermal effects of non-ionizing radiation in the human body. In 2000, the World Health Organisation (WHO) produced a background paper on 'Electromagnetic fields and public health; Cautionary Policies', which advocated a precautionary approach to exposure to EMF. At the same time, in the UK, the Stewart Independent Expert Group on Mobile Phones concluded that the balance of evidence suggested that exposure to radiofrequency radiation at levels below the limits set in national and international guidelines did not adversely affect the health of the general population. However, they also recommended that the precautionary approach should be used, particularly in discouraging children from unnecessary exposure. Research in the US and Denmark failed to establish a link between the use of mobile phones and various cancers. Links were found between high levels of exposure to extremely low frequency EMF and childhood leukemia, but such exposure is rare. Other studies in Sweden and the UK only pointed to weak links between EMF exposure and health effects. However, these studies did not focus on sensitive individuals

The non-thermal effects of EMR/EMF have been increasingly described as affecting the well-being of small numbers of people in many different countries who appear to be sensitive to electromagnetic fields. In 2003, a Dutch Government study confirmed links between exposure to EMF and well-being in sensitive subjects but as yet no biological mechanism for this sensitivity has been established. There are reports in the medical literature detailing the physiological impacts caused by exposure to this type of radiation at normal levels. However, there have been no long term studies of the health impact of continuous exposure to non-ionizing radiation. The symptoms reported by participants in the present study are similar to those described in studies in other countries.

Conclusion:

This descriptive study demonstrates the devastating effects that exposure to electromagnetic radiation and electromagnetic fields appears to have on seemingly sensitive individuals. The self-selected group of study participants described a range of symptoms which varied in intensity from mild to disabling and which appeared to be largely related to exposure to EMR/EMF. The Irish Doctors' Environmental Association remains concerned at possible adverse health impacts from exposure to non-ionizing radiation and believes that further research is required to investigate the relationship between this exposure and the symptoms that are experienced. Phase 2 of this research will investigate the effect of screening individuals from this pervasive radiation on the symptoms they experience using double blind techniques. The Irish Doctors Environmental Association would also be happy to collaborate with other organisations interested in research in this area.

Acknowledgements

The Irish Doctors' Environmental Association (IDEA) are grateful to the Irish Electromagnetic Radiation Victims Network (IERVN) for their assistance in helping us to identify participants for this study. We would also like to acknowledge the co-operation of all of the participants who kindly gave their time and submitted themselves to the detailed questionnaire, a physical examination and the laboratory tests. We hope that this study will lead to an improved understanding of their condition. In addition, we are grateful to Ms. Phil Coffey and Dr. Zulfiya Mamaeva who conducted the field work for us.

This study was funded by the Eithne Naylor legacy, which is also gratefully acknowledged.

Appendix:

Irish Doctors' Environmental Association (IDEA)

Position Paper on Electro-Magnetic Radiation

The Irish Doctors Environmental Association believes that a sub-group of the population are particularly sensitive to exposure to different types of electro-magnetic radiation. The safe levels currently advised for exposure to this non-ionizing radiation are based solely on its thermal effects. However, it is clear that this radiation also has non-thermal effects, which need to be taken into consideration when setting these safe levels. The electro-sensitivity experienced by some people results in a variety of distressing symptoms which must also be taken into account when setting safe levels for exposure to non-ionizing radiation and when planning the siting of masts and transmitters.

1. An increasing number of people in Ireland are complaining of symptoms which, while they may vary in nature, intensity and duration, can be demonstrated to be clearly related to exposure to electro-magnetic radiation (EMR).
2. International studies on animals over the last 30 years have shown the potentially harmful effects of exposure to electro-magnetic radiation. In observational studies, animals have shown consistent distress when exposed to EMR. Experiments on tissue cultures and rats have shown an increase in malignancies when exposed to mobile telephone radiation.
3. Studies on mobile telephone users have shown significant levels of discomfort in certain individuals following extensive use or even, in some cases, following regular short-term use.
4. The current safe levels for exposure to microwave radiation were determined based solely on the thermal effects of this radiation. There is now a large body of evidence that clearly shows that this is not appropriate, as many of the effects of this type of radiation are not related to these thermal effects.

The Irish Doctors' Environmental Association believes that the Irish Government should urgently review the information currently available internationally on the topic of the thermal and non-thermal effects of exposure to electro-magnetic radiation with a view to immediately initiating appropriate research into the adverse health effects of exposure to all forms of non-ionizing radiation in this country, and into the forms of treatment available elsewhere. Before the results of this research are available, an epidemiological database should be initiated of individuals suffering from symptoms thought to be related to exposure to non-ionizing radiation. Those claiming to be suffering from the effects of exposure to electro-magnetic radiation should have their claims investigated in a sensitive and thorough way, and appropriate treatment provided by the State. The strictest possible safety regulations should be established for the installation of masts and transmitters, and for the acceptable levels of potential exposure of individuals to electro-magnetic radiation, in line with the standards observed in New Zealand.