

The Microwave Syndrome or Electro-Hypersensitivity: Historical Background



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Symptoms of Electro-Hypersensitivity (EHS)



- EHS is one of a series of syndromes, called “ideopathic environmental intolerance” or “medically unexplained symptoms” characterized by fatigue, headache, weakness, memory impairment, sleep disturbances and a general feeling of ill health.
- EHS frequently co-exists with chronic fatigue syndrome, multiple chemical sensitivity, Gulf War Illness, fibromyalgia and several other less common diseases.
- The cause of each of these disorders is unknown, but at least for some of them there is an initial triggering event.

Historical Perspectives on EHS



- Western countries have generally considered that there can be no adverse biological effects of electromagnetic fields (EMFs), including radiofrequency (RF) fields, that are not mediated by tissue heating.
- The Soviets, on the other hand, reported years ago that individuals experienced headache, fatigue, difficulty in concentration, depression, emotional instability and irritability when exposed to RF fields at intensities much lower than those causing measureable tissue heating, and set exposure standards accordingly.

The Soviet View



- “...EMFs can have non-thermal effects and that living organisms of diverse species – from unicellular organisms to man – are extremely sensitive to EMFs. Some of the discovered features of the biological action of EMFs clearly do not fit the Procrustean bed of the heat theory.” (V. Parin, 1970, in a forward to a book reviewing Soviet bioelectromagnetic research, quoted by Maisch, 2010).
- “Procrustean” means that we all are not equally vulnerable to EMFs.

Health Effects of RF Radiation



- Beginning in 1953 the US Embassy in Moscow was irradiated with microwaves at up to $18 \mu\text{W}/\text{cm}^2$ and frequencies from 0.6 to 9.5 GHz.
- While no elevations of cancer were found, many people developed “microwave sickness”, consisting of depression, irritability, difficulty in concentrating and memory loss (Pollack, 1979).
- Most authorities ascribed these symptoms to anxiety.
- “Microwave sickness” is EHS!

Early EHS Studies in the West



- In a series of reports (1962, 1965, 1967) Frey reviewed Western studies showing effects of RF on brain and behavior, and concluded that there were changes not mediated by tissue heating. He concluded that “peak rather than average power density was determined to be the more important variable in the study of the effect of modulated low power density RF energy on biological functions”.
- This is a particularly important conclusion given recent studies on the particular potency of “smart meter” RF in triggering EHS and of “dirty electricity”. Smart meters use very high intensity, short duration pulses.

Reports of Excessive Exposure to Radar



- Forman et al. (JOM 24: 932: 1982) reported on two men accidentally exposed to microwaves. Both exhibited symptoms of headaches, insomnia, irritability and emotional lability even after a 12-month follow-up.
- Schilling (OEM 54: 281: 1997) reported on three men acutely exposed to 785 MHz RF who immediately developed EHS symptoms that lasted over a 3-year follow-up. Later (OM 50: 49: 2000) he reported on six antenna engineers acutely exposed in two separate incidents. Four developed EHS with no improvement over 3-4 years follow-up. Headache, loss of stamina, malaise and lassitude were the major symptoms.

Is EHS Real or Psychosomatic?



- Rea et al. (J Bioelect 101: 241: 1991) studied 100 people who reported effects of low energy EMFs and tested them in a blinded fashion. Twenty-five responded to applied EMFs but not to “blanks”. Thus they concluded that only 25% of reported EHS persons showed true responses to applied fields.
- Others have reported an inability of persons reporting to have EHS to distinguish whether or not the ELF or RF is on (Rubin et al., 2005; Eltiti et al., 2007), while McCarty et al. (2011) reported on a single individual who showed a statistically significant ability to report adverse symptoms when ELF fields were on.

The History of RG, age 38



- RG was a healthy technical expert hired to repair RF generating equipment in a room with 15 radios in 2011. All supposed to be off, but six were not.
- After 1.5 hours at work he developed a headache, nausea and dizziness. At an emergency room he had mild burns on face, head and neck.
- A month later he has constant headache, dizziness, photophobia, nausea, confusion and difficulty with cognition.
- He came to my office 2.2 years later at which time he suffered from constant headaches, confusion, memory loss, pains, nausea, vertigo and constant anxiety and depression.
- He has all the symptoms of EHS, triggered by an acute RF exposure.

The History of JJ, age 41



- JJ was involved in home repair when he touched a live electric wire and lost consciousness for about 30 seconds. He fortunately did not suffer cardiac arrest.
- Subsequently he was fatigued, had severe photophobia and severe headaches, which he had never experienced before.
- Four years later he has constant dizziness, frequent headaches, vertigo and nausea. All symptoms are made worse in the presence of EMFs, especially RF.
- This case is unusual in that the development of EHS was precipitated by an electrocution event.

Another JJ, age 41



- JJ, an engineer, and his wife, a physician, were both healthy until returning home after a summer vacation.
- Within days of returning home both developed intense headaches, tinnitus, heart palpitations and insomnia.
- While they were away a bank of smart meters had been installed directly below their bedroom.
- Even after removal of the smart meters both remain electrosensitive, with headaches the major symptom upon any RF exposure.

Does EHS Develop After an Acute Event?



- These reports suggest that an acute exposure to EMFs and even electric current can trigger EHS.
- Most individuals who report that they are electrosensitive do not identify an acute event as a trigger, but there may have been one that they just haven't identified. Alternatively their symptoms may not be due to EMFs.
- It is very unlikely that the sudden development of EHS which lasts for years after an acute exposure is due only to psychological factors.

Considerations



- A number of people report that they developed EHS after a smart meter was installed on their or a neighbor's home. This may be the “acute” event.
- The studies of Rea et al. suggest that up to 75% of people who report being electrosensitive may not be. This is not to dismiss their symptoms, but rather to suggest that the cause is something other than EMFs or RF.
- It is important to develop objective tests to determine true EHS, while at the same time acknowledging that some symptoms are psychological in origin.
- There needs to be much further study of peak intensity rather than average power.

Conclusions



- EHS is real, but not everyone who thinks they are electrosensitive is.
- EHS is related to other disease syndromes characterized by similar symptoms. Much more study is needed to determine what are the triggering events and especially what are the mechanisms of action.
- We cannot expect to develop effective treatments (other than reducing exposure) until we understand the mechanisms responsible for expression of EHS.
- Investigations of EHS should acknowledge its similarity and probably basic mechanisms in common with other syndromes expressing similar symptoms.