Iranian J Publ Health, Vol. 43, No.12, Dec 2014, pp.1724-1725

Letter to the Editor

Introducing a Novel Multi-Phase Method for Effective Screening of the Individuals Diagnosed with Electromagnetic Hypersensitivity

Seyed Mohammad Javad MORTAZAVI [1, 2], Faroogh KHADEMI [3], Seyed Alireza MORTAZAVI [3]

1. Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC), School of Allied Medical Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

2. Dept. of Medical Physics and Medical Engineering, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

3. Student Research Committee, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

***Corresponding Author:** Email: mmortazavi@sums.ac.ir

(Received 11 Oct 2014; accepted 05 Nov 2014)

Dear Editor-in-Chief

Here we introduce a novel multi-phase method for effective screening of the patients diagnosed with Electromagnetic hypersensitivity (EHS). EHS is a phenomenon usually characterized by non-specific symptoms such as redness, tingling, burning sensations, fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitation and digestive disturbances after exposure to electromagnetic fields (EMFs). EHS is characterized by a variety of non-specific symptoms, which afflicted individuals attribute to exposure to EMF. The symptoms most commonly experienced include dermatological symptoms as well as neurasthenic and vegetative symptoms. The collection of symptoms is not part of any recognized syndrome. World Health Organization (WHO) believes that EHS reveals as a variety of non-specific symptoms, which differs among different individuals. WHO suggests that EHS individuals, health-care professionals and employers should be informed about possible adverse health effects of exposure to EMF by the governments (1). Now there is a debate over whether EHS is unrelated to the presence of electromagnetic fields and to date the etiology of EHS is not clearly understood. The population based surveys performed over the past years have estimated the prevalence of EHS in some cities/countries; e.g. 1.5% in Sweden (2), 5% in Switzerland (3), 3.2% in California (4), 3.5% in Austria (5), 4% in the UK (6), and an extraordinary rate of 13.3% in Taiwan (7). It is hypothesized that ethnicities may play a basic role in determining the EHS risk (4). Some studies have shown that the avoidance of electromagnetic fields can help in full or partial recovery (removed or lessened symptoms) in a large proportion of EHS persons (8).

However, it is found interestingly that individuals with psychiatric problems are more likely to report sensitivity to electromagnetic fields (9). We have previously published reports on the health effects of exposure to different sources of electromagnetic fields such as mobile phones and their base stations, mobile phone jammers, laptop computers, radars, dentistry cavitrons and MRI (10-12). For introducing a method for screening of the patients diagnosed with electromagnetic hypersensitivity, we used a calibrated ICU monitoring system for recording the patient's biological parameters such as systolic and diastolic blood pressure, mean arterial pressure, oral and peripheral temperature, heartbeat and respiration. Our method is

composed of six consecutive phases; I: patient was exposed to mobile phone microwave radiations for 10 minutes. II: sham exposure for 10 minutes. III: same as phase I but the patient was informed that the mobile phone was on (in the talk mode). Phase IV, the patient was sham exposed and was informed that the mobile phone was switched off. V: same as phase I but the patient was given incorrect information (he/she was told that the mobile phone was switched off). VI: same as phase II but the patient was given incorrect information (he was told that the mobile phone was on). In each phase, patients were asked if they could feel the presence of electromagnetic fields. Our preliminary results show that EHS patients cannot recognize real and sham exposures in different phases of the experiment. Furthermore, monitoring of the patient's biological parameters in each phase could not show statistically significant differences between the means of biological parameters in real exposure and sham exposure phases. Altogether, our preliminary findings confirm that under blind conditions, exposure to EMFs cannot trigger any subjective symptoms. Based on the findings of our multi-phase method, it can be hypothesized that neurological symptoms such as headache in EHS patients is not caused by the presence of electromagnetic fields. These findings lead us to this conclusion that psychological factors possibly play an important role in electromagnetic hypersensitivity.

Acknowledgements

The authors declare that there is no conflict of interests.

References

1. World Health Organization (2005). Electromagnetic fields and public health. Fact sheet No 296. Geneva: *WHO Media Centre*.
2. Hillert L, Berglind N, Arnetz BB, Bellander T (2002). Prevalence of self-reported hypersensitivity to electric or magnetic fields in a population-based questionnaire survey. *Scand J Work Environ Health*, 33-41.
3. Schreier N, Huss A, Röösli M (2006). The prevalence of symptoms attributed to electromagnetic field exposure: a cross-sectional representative survey in Switzerland. *Soz Praventivmed*, 51: 202-209.
4. Levallois P, Neutra R, Lee G, Hristova L (2002). Study of self-reported hypersensitivity to electromagnetic fields in California. *Environ Health Perspect*, 110: 619.
5. Schröttner J, Leitgeb N (2008) Sensitivity to electricity–temporal changes in Austria. BMC Public Health 8: 310.
6. Eltiti S, Wallace D, Zougkou K, Russo R, Joseph S, et al. (2007). Development and evaluation of the electromagnetic hypersensitivity questionnaire. *Bioelectromagnetics*, 28: 137-151.
7. Meg Tseng M-C, Lin Y-P, Cheng T-J (2011). Prevalence and psychiatric comorbidity of self-reported electromagnetic field sensitivity in Taiwan: A population-based study. *J Formos Med Assoc*, 110: 634-641.
8. Hagström M, Auranen J, Ekman R (2013). Electromagnetic hypersensitive Finns: Symptoms, perceived sources and treatments, a questionnaire study. *Pathophysiology*, 20: 117-122.
9. Tseng MCM, Lin YP, Hu FC, Cheng TJ (2013). Risks Perception of Electromagnetic Fields in Taiwan: The Influence of Psychopathology and the Degree of Sensitivity to Electromagnetic Fields. *Risk Anal*, 33: 2002-2012.
10. Mortazavi SMJ, Taeb S, Dehghan N (2013). Alterations of Visual Reaction Time and Short Term Memory in Military Radar Personnel. *Iran J Publ Health*, 42: 428-435.
11. Mortazavi SMJ, Rouintan MS, Taeb S, Dehghan N, Ghaffarpanah AA, et al. (2012). Human short-term exposure to electromagnetic fields emitted by mobile phones decreases computer-assisted visual reaction time. *Acta Neurol Belg*, 112: 171-175.
12. Mortazavi SA, Tavakkoli-Golpayegani A, Haghani M, Mortazavi SM (2014). Looking at the other side of the coin: the search for possible biopositive cognitive effects of the exposure to 900 MHz GSM mobile phone radiofrequency radiation. *J Environ Health Sci Eng*, 12: 75.