

Association between electromagnetic field exposure and abortion in pregnant women living in Tehran

Dear Editor

With great interest, we have read the article by Abad *et al.* entitled "Association between electromagnetic field exposure and abortion in pregnant women living in Tehran" that is published in International Journal of Reproductive BioMedicine Vol. 14. No. 5. pp: 347-354, May 2016. In this article, the authors evaluated the possible associations between electromagnetic waves exposure level and the rate of miscarriage in pregnant women. The electromagnetic radiation, in this study, had a significant association with the increased abortion in women who were exposed to these radiations. These findings were based on the measurements of electromagnetic waves within the residential locations of the 413 samples, very close to the entrance door of their home, according to the standard instructions of ICNIRP. Over the past several years, our laboratories at the Ionizing and Non-ionizing Radiation Protection Research Center (INIRPRC) have expanded their focus on studying the health effects of exposure to some common and/or occupational sources of electromagnetic fields (EMFs) such as cellular phones (1-9), mobile base stations (10), mobile phone jammers (11, 12), laptop computers (13), radars (2), dentistry cavitrons (14) and MRI (15, 16). Although the paper authored by Abad *et al.* is a well-structured article and addresses a very challenging issue, it has some major shortcomings. The first shortcoming of this paper comes from this cardinal point that the authors have simply ignored the role of exposure to extremely low frequency EMFs (e.g. exposure of the pregnant women living in houses close to power lines). It is worth noting that the NARDA SRM-3000 used in their study operates in the frequency range of 27MHz-3GHz and cannot measure extremely low frequency EMFs. It is also worth mentioning that previous studies conducted in Iran indicated that the exposure to extremely low frequency electromagnetic fields is probably related to early spontaneous abortions (17). Another shortcoming of this paper comes from ignoring the role of mobile phone/cordless phone use by pregnant women in evaluation of the risk of abortion. It should be noted that some studies conducted in Iran showed that the use of mobile phones can be linked to the early spontaneous abortions (18). We hope that our comments help better understanding of the effects of EMF on the pregnancy outcome.

Seyed Mohammad Javad Mortazavi^{1,2} Ph.D., Seyed Alireza Mortazavi³ M.D., Maryam Paknahad⁴ M.Sc.

1. Medical Physics Department, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

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

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

4. Dentomaxillofacial Radiology Department, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran

Corresponding author:

Maryam Paknahad, Dentomaxillofacial Radiology Department, Shiraz Dental School, Ghasrodasht St., Shiraz, Iran. 7144833586

Email: paknahadmaryam@yahoo.com

Tel/Fax: (+98) 711 2292680

Received: 29 May 2016

Accepted: 4 December 2016

References

1. Mortazavi SMJ, Motamedifar M, Namdari G, Taheri M, Mortazavi AR, Shokrpour N. Non-Linear Adaptive Phenomena which Decrease the Risk of infection after Pre-Exposure to Radiofrequency Radiation. *Dose-Response* 2014; 12: 233-245.
2. Mortazavi SMJ, Taeb S, Dehghan N. Alterations of Visual Reaction Time and Short Term Memory in Military Radar Personnel. *Iran J Publ Health* 2013; 42: 428-435.
3. Mortazavi SMJ, Rouintan MS, Taeb S, Dehghan N, Ghaffarpanah AA, Sadeghi Z, et al. Human short-term exposure to electromagnetic fields emitted by mobile phones decreases computer-assisted visual reaction time. *Acta Neurologica Belgica* 2012; 112: 171-175.
4. Mortazavi SMJ, Mosleh-Shirazi MA, Tavassoli AR, Taheri M, Mehdizadeh AR, Namazi SAS, et al. Increased Radioresistance to Lethal Doses of Gamma Rays in Mice and Rats after Exposure to Microwave Radiation Emitted by a GSM Mobile Phone Simulator. *Dose-Response* 2013; 11: 281-292.
5. Mortazavi S, Mosleh-Shirazi M, Tavassoli A, Taheri M, Bagheri Z, Ghalandari R, et al. A comparative study on the increased radioreistance to lethal doses of gamma rays after exposure to microwave radiation and oral intake of flaxseed oil. *Iran J Radiat Res* 2011; 9: 9-14.
6. Mortazavi SMJ, Habib A, Ganj-Karimi AH, Samimi-Doost R, Pour-Abedi A, Babaie A. Alterations in TSH and Thyroid Hormones Following Mobile Phone Use. *OMJ* 2009; 24: 274-278.
7. Mortazavi SMJ, Daiee E, Yazdi A, Khabani K, Kavousi A, Vazirinejad R, et al. Mercury release from dental amalgam restorations after magnetic resonance imaging and following mobile phone use. *Pak J Biol Sci* 2008; 11: 1142-1146.

8. Mortazavi SMJ, Ahmadi J, Shariati M. Prevalence of subjective poor health symptoms associated with exposure to electromagnetic fields among University students. *Bioelectromagnetics* 2007; 28: 326-330.
9. Mortazavi SMJ, Motamedifar M, Namdari G, Taheri M, Mortazavi AR. Counterbalancing immunosuppression-induced infections during long-term stay of humans in space. *J Med Hypotheses Ideas* 2013; 7: 8-10.
10. Mortazavi SMJ. Safety issue of mobile phone base stations. *J Biomed Physic Eng* 2013; 3: 1-2.
11. Mortazavi S, Parsanezhad M, Kazempour M, Ghahramani P, Mortazavi A, Davari M. Male reproductive health under threat: Short term exposure to radiofrequency radiations emitted by common mobile jammers. *J Hum Reprod Sci* 2013; 6: 124-128.
12. Parsanezhad ME, Mortazavi SMJ, Doohandeh T. Exposure to Radiofrequency Radiation Emitted from Mobile Phone Jammers Adversely Affects the Quality of Human Sperm. *Int J Radiat Res* 2015; in press.
13. Mortazavi SMJ, Tavasoli AR, Ranjbari F, Moamaei P. Effects of Laptop Computers' Electromagnetic Field on Sperm Quality. *J Reprod Infertil* 2011; 11: 251-258.
14. Mortazavi SM, Vazife-Doost S, Yaghooti M, Mehdizadeh S, Rajaie-Far A. Occupational exposure of dentists to electromagnetic fields produced by magnetostrictive cavitrons alters the serum cortisol level. *J Nat Sci Biol Med* 2012; 3: 60-64.
15. Mortazavi SM, Paknahad M. Effect of magnetic resonance imaging on microleakage of amalgam restorations: an in vitro study. *Dentomaxillofac Radiol* 2016; 45: 20150187.
16. Mortazavi SMJ, Neghab M, Anooshe SMH, Bahaeddini N, Mortazavi G, Neghab P. High-field MRI and Mercury release from dental amalgam fillings. *THE IJOEM* 2014; 5: 101-105.
17. Shamsi Mahmoudabadi F, Ziaei S, Firoozabadi M, Kazemnejad A. Exposure to extremely low frequency electromagnetic fields during pregnancy and the risk of spontaneous abortion: a case-control study. *J Res Health Sci* 2013; 13: 131-134.
18. Mahmoudabadi FS, Ziaei S, Firoozabadi M, Kazemnejad A. Use of mobile phone during pregnancy and the risk of spontaneous abortion. *J Environment Health Sci Eng* 2015; 13: 34.

Author reply

Dear Editor

We are greatly thankful for the precious comments of the esteemed commentator, Dr. Mortazavi. Hereby, you can find my peer-to-peer response to his worthy comments:

First comment: As it is clear, our research is focuses on exposed electromagnetic waves rather than fields. We know that in the case of ELF, according to low frequency of 50 Hz, any wave radiation is impossible from low length cables or other electromagnetic sources, and only electric and magnetic inductions effect the receptor, that are all totally out of the scope of this article. Hence, the ELF frequency range is not included in the study with intent, so the comment should crucially not be considered as shortcoming of the study.

Second comment: It is obvious that the article focuses on downlink electromagnetic waves which are special types of electric field coupled with magnetic field radiating in the speed of light, which means electromagnetic waves down-coming from electromagnetic sources as the panel antennas installed on the cellphone towers, television broadcast towers, etc. to the human as subjects of susceptibility. In all measurements shown in the article, the downlink frequency range is set in Narda measuring instrument, not the uplink frequency ranges which are radiated from mobile phones or the other radiating devices used as accessories or laptop and so on mentioned at commentator's reference 18. As you know, so called uplink frequencies are the same for all samples studied, so can be rightly excluded from the study. Therefore the uplink frequency range is not set with intent.