



Oral Presentation

doi: 10.5835/jecm.omu.30.03.021

Interaction of magnetic field-cardiovascular system as a potential risk

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ARTICLE INFO

ABSTRACT

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Keywords:

Electromagnetic field
Cell membrane
Heart rate
Heart rate variability

Electromagnetic pollution is an unavoidable reality in today's world and in our lives. There are many different sources of electromagnetic radiation like industrial electrical equipment, electrical appliances, medical instruments, such as magnetic resonance imaging (MRI), high electrical power lines. The first structures sensitive to electromagnetic fields are signal processing structures: Cell surface receptors, ion channels and ion entrance and exit through these channels, Ca^{+2} across the cell membrane, such as Na ion enters and leaves the ion binding, signal transduction (neurotransmitters, hormones, enzymes), ion transport, and its action on the activation of certain enzymes. Magnetic fields takes place is known about the mechanisms by which biological effects created by is limited. An external field applied to cardiac tissue, cardiac tissue changes in transmembrane potential, form a tap depolarized cells, while some parts, some parts will be hyperpolarized. Cardiac system, which is considered as the basic cells of the node input and output of ions into cells with the contract and loose, started warning, pumping blood to the body. Ion movements and input-output paths of these ions is the voltage-sensitive ion channels, the effect of the magnetic field on these structures, to create a serious and immediate risks to life. In electricity of the heart, two parameters are important. Heart rate (HR) and heart rate variability (HRV): HRV is defined as the cyclic changes in sinus rhythm in time. Providing information about the balance of sympathetic and parasympathetic HRV, a measure of cardiac tone. According to the results of different studies a common, long-term interactions with the magnetic field strength of at least some form of cardiovascular risks. A survey of 140,000 people working in high voltage transmission lines, high magnetic field workers exposed to a longer period of time, due to arrhythmia and acute myocardial infarction mortality rates were higher. In individuals exposed to magnetic fields in tesla level, there was not observed the risk of sudden cardiac death. But, decreasing in LF (low frequency) being one of the HRV parameters and increasing in HF (high frequency) being other one of HRV parameters were observed. The patients with pacemaker and stent can't take to MR fields in tesla level. The patients with HRV must take in the control of a doctor. Jeomagnetik fields and magnetic storms, it is considered to induce long-term cardiac problems. Cardiovascular risks of exposure to ELF magnetic fields for a period of 5-6 years is the result of a joint formed by several studies.

J. Exp. Clin. Med., 2013; 30: 276

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