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Provocation Study using Heart Rate Variability shows Radiation from 2.4 GHz Cordless Phone affects Autonomic Nervous System

Magda Havas, Jeffrey Marrongelle, Bernard Pollner, Elizabeth Kelley, Camilla R.G. Rees, Lisa Tully

IN: Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter. Giuliani, L. and M. Soffritti (Eds). 2010. An ICEMS Monograph, Ramazzini Institute. Eur. J. Oncol. Library Vol 5: 273-300.

Abstract

Purpose: The effect of pulsed microwave radiation on heart rate variability (HRV) was tested in a double blind study. *Method:* Twenty-five subjects in Colorado between the ages of 37 to 79 completed an electrohypersensitivity (EHS) questionnaire. After recording their orthostatic HRV, we did continuous real-time monitoring of HRV in a provocation study, where supine subjects were exposed for 3-minute intervals to radiation generated by a pulsed cordless phone at 2.4 GHz or to sham exposure.

Results: Questionnaire: Based on self-assessments, participants classified themselves as extremely electrically sensitive (24%), moderately (16%), slightly (16%), not sensitive (8%) or with no opinion (36%) about their sensitivity. The top 10 symptoms experienced by those claiming to be sensitive include memory problems, difficulty concentrating, eye problems, sleep disorder, feeling unwell, headache, dizziness, tinnitus, chronic fatigue, and heart palpitations. The five most common objects allegedly causing sensitivity were fluorescent lights, antennas, cell phones, Wi-Fi, and cordless phones.

Provocation Experiment: Forty percent of the subjects experienced some changes in their HRV attributable to MW radiation. For some the response was extreme (tachycardia), for others moderate to mild (changes in SNS and/or PSNS). and for some there was no observable reaction either because of high adaptive capacity or because of systemic neurovegetative exhaustion.

Conclusions: Orthostatic HRV combined with provocation testing may provide a diagnostic test for some EHS sufferers when they are exposed to electromagnetic emitting devices. This is the first study that documents immediate and dramatic changes in both HR and HRV associated with MW exposure at levels well below (0.5%) federal guidelines in Canada and the United States (1000 microW/cm²).

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