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The effect of single 30 minute long 3G EMF exposure on auditory evoked potentials, automatic deviance detection and spontaneous EEG

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Potential effects of 30 min irradiation of a Universal Mobile Telecommunication System 3G mobile phone (MP) were investigated on human cortical auditory evoked potentials (AEPs), automatic (pre-attentive) change detection indexed by mismatch negativity (MMN) and spontaneous EEG (sEEG). We analyzed 26 and 8 healthy young volunteers' AEPs and sEEG, respectively. In the AEP experiment, 1 kHz ($P=0.9$) tone was used as standard and 1.5 kHz tone ($P=0.1$) as deviant stimuli. Both AEPs and sEEG experiments were designed as double-blind tasks where the subjects were exposed to either genuine or sham irradiation in two separate sessions. Each session was comprised of two 10 min long recording blocks. In each experiment (AEP, sEEG) the subjects' task was to watch a documentary film with no sound when EEG was recorded from midline electrodes (Fz, Cz, Pz). Between the blocks, subjects were exposed to either sham or genuine EMF irradiation. We found no significant effect of EMF irradiation on the amplitude and latency of the P50, N100 and P200 AEP components and the MMN for both standard and deviant stimuli. The analysis did not show any significant effect of EMF irradiation on the delta, theta alpha I, alpha II, beta I and beta II power of frequency bands. In summary, our data do not support the notion that a single 30 min long 3G EMF exposure interferes with auditory evoked potentials, automatic change detection and the spontaneous EEG.

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