

The analysis of an AC electromagnetic field for hemodynamics in human subjects

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This study focuses on the acute effects of non-thermal alternating current (AC) electromagnetic field (EMF) exposure (50 Hz, peak magnetic flux density B_{max} 180 mT, 15-min duration of exposure) on blood flow velocity in healthy human subjects. In a randomized, double-blind, and counterbalanced manner, the sham control (CTL) exposure, the EMF forearm, or neck exposure was carried out respectively (Figure 1). The values of the blood flow velocity rate in the CTL exposure was significantly decreased compared with the baseline value (Figure 2). The values of the blood flow velocity rate were significantly increased by the forearm exposure and were not significantly changed by the neck exposure compared with the sham control exposure (Figure 2). These EMF effects seem to be dose dependent and may be region specific. Further investigation on the effects is being conducted to clarify the interaction of EMF with hemodynamics as well as nervous system.

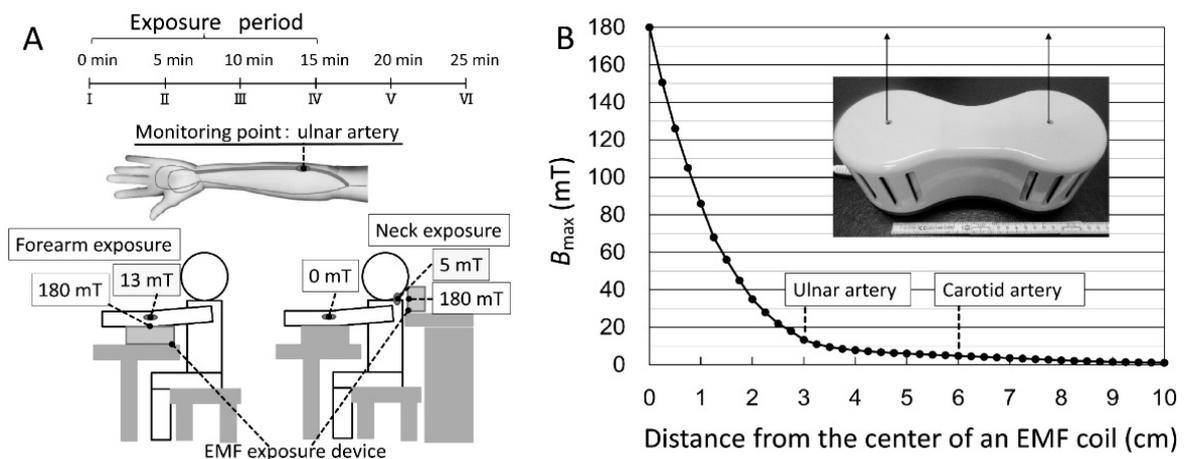


Figure 1. Experimental protocol (A) and EMF exposure values (B).

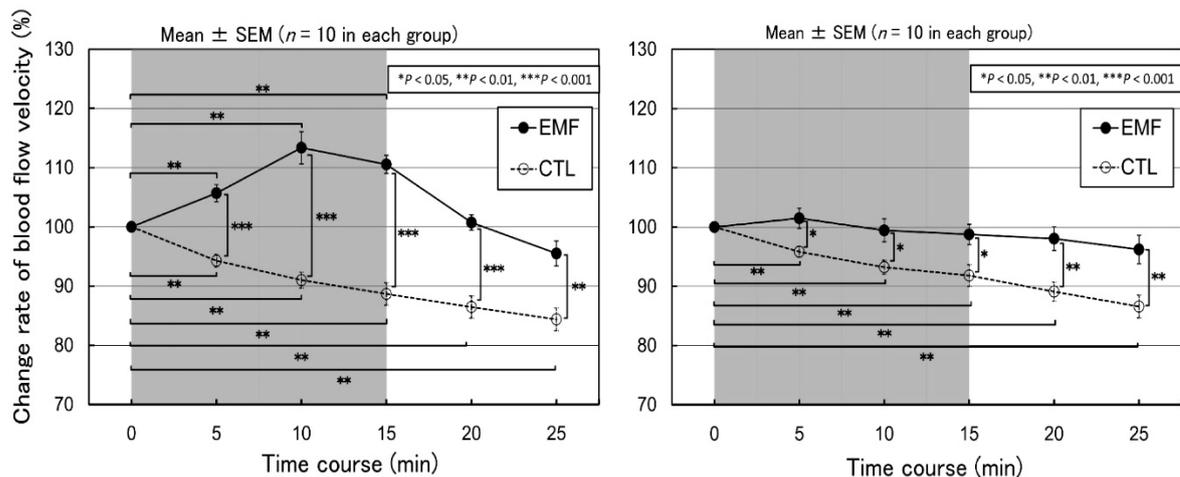


Figure 2. Effects of forearm (A) and neck (B) exposure on the blood flow velocity in an ulnar artery. EMF: electromagnetic field exposure, CTL: sham control exposure.