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Changes in low density lipoprotein susceptibility to oxidation under the exposures of AC magnetic fields *in vitro*

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Background and Aims: There has been some suggestion that exposure to electromagnetic fields may affect the course of cardiovascular disease in human. Low density lipoprotein (LDL) modifications such as peroxidation have an important role in the pathogenesis of atherosclerosis. The aim of present study was to investigate the effects of different AC magnetic fields on LDL oxidation in vitro.
Methods: LDL was isolated from fresh pool serum by sequential density gradient ultracentrifugation. Cooper induced oxidation of LDL was measured by continues monitoring of formation of conjugated dienes at wavelength of 234 nm under the exposure of 0.25, 0.5, 1 and 2 mT AC magnetic fields at 37°C. A solenoid cylinder contain 1200 turns with an AC regulated power supply was used to produce suitable current in solenoid.
Results: The lag time were decreased from 54.6 ± 2.6 in control to 48.2 ± 2.9, 50.3 ± 1.9, 47.4 ± 2 and 40.1 ± 2.6 and the propagation rate of LDL oxidation were increased from 622.6 ± 11.2 to 630.5 ± 14.1, 664.4 ± 19.3, 687.4 ± 10.8 and 745.8 ± 17.1 in 0.25, 0.5, 1 and 2 mT AC magnetic flux densities respectively.
Conclusions: It is concluded that the susceptibility of LDL to oxidation may increased under the exposure of low AC magnetic flux densities invitro in a dose dependent manner.

Keywords: AC magnetic field; ox-LDL; LDL zeta potential; LDL aggregation; Atherosclerosis