

[P-63]**Extremely Low Frequency-electromagnetic Fields Have a Latency to Evoke Anti-Apoptotic Machinery in Leydig Cells**

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The potential risk of extremely low frequency-electromagnetic fields (ELF-EMF) exposure to human has been debated to date throughout the world. Although several experiments for the risk assessment have been performed in vivo as well as in vitro, it is quite clear that there are no critical and sufficient evidences for the establishment of the theory, yet. In the present study, we tested whether ELF-EMF (60Hz) can directly give an influence to cellular destiny (cell death vs. cell survival). The Leydig cells (TM3) were cultured under the ELF-EMF exposure (0.5mT~1.5mT) by Helmholtz-based exposure apparatus set inside of the CO₂ incubator. The ELF-EMF exposure did not cause a change of cell cycle even under very high intensity of ELF-EMF (1.5mT). Depolarization of mitochondrial membrane potential (MMP) was not occurred in 0.5 and 1.0 mT exposed group, but the MMP significantly decreased in 1.5 mT exposure. Anti-apoptotic proteins [X-chromosome-linked inhibitor of apoptosis protein (XIAP), survivin and bcl-2] and proapoptotic proteins (Bax, cytochrome c, caspase-3) have been studied by western blot analysis as well as immunocytochemistry. The up-regulation of Bax, cytochrome c release from mitochondria, caspase-3 activation were not seen in ELF-EMF-exposed cells, indicating that ELF-EMF is not able to induce cell death(apoptosis) under the acute exposure even with strong intensity in this cells. More importantly, most of anti-apoptotic proteins were up-regulated in response to ELF-EMF which suggests that the ELF-EMF may act as a potential physical apoptotic factor. We are aware that the ELF-EMF intensity employed in this study is quite higher than that human might be realistically exposed from living and occupational environments. However, it is carefully assumed that ELF-EMF have a latency to damage the cells under certain circumstances (i.e.,prolonged long-term exposure). The further precise studies in this research area are keenly needed in near future.

Keyword : ELF-EMF, Leydig cell, cell survival, apoptosis