



Spatial memory recovery in Alzheimer's rat model by electromagnetic field exposure

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Abstract

Introduction: Although studies have shown a potential association between extremely low frequency electromagnetic fields (ELF-EMFs) exposure and Alzheimer's disease (AD), few studies have been conducted to investigate the effects of weak magnetic fields on brain functions such as cognitive functions in animal models. Therefore, this study aimed to investigate the effect of ELFEMF exposure (50 Hz, 10 mT) on spatial learning and memory changes in AD rats.

Methods: Amyloid-b (Ab) 1-42 was injected into lateral ventricle to establish an AD rat model. The rats were divided into six groups: Group I (control); Group II (surgical sham); Group III (AD) Alzheimer's rat model; Group IV (MF) rats exposed to ELF-MF for 14 consecutive days; Group V (Ab injection+M) rats exposed to magnetic field for 14 consecutive days from day 0 to 14 days after the Ab peptide injection; Group VI (AD+M) rats exposed to magnetic field for 14 consecutive days after 2 weeks of Ab peptide injection from 14th to 28th day. Morris water maze investigations were performed.

Results: AD rats showed a significant impairment in learning and memory compared to control rats. The results showed that ELF-MF improved the learning and memory impairments in Ab injection+M and AD+M groups.

Conclusion: Our results showed that application of ELF-MF not only has improving effect on different cognitive disorder signs of AD animals, but also disrupts the processes of AD rat model formation.

Biography

Dr. Meysam Ahmadi (was born in 1980 in Shiraz, Iran). he obtained BSc. In Biology (Microbiology), MSc. In Cellular and Molecular Biology and PhD in Biophysics from Tehran University. In addition to, he has spent six months in Italy and studied the magnetic field effects on neural cells. He joined the Neuroscience Department in October 2014 as a faculty member.. He has collaboration with salento University (Italy). Techniques used in his laboratory include cellular and molecular assay such as cell culture, PCR, Western blotting and studies in animal models. He is interested to finding the mechanism of Electromagnetic fields action on Neurodegenerative, Alzheimer disease, Cancer, memory and learning.