

MEETING ABSTRACT

Open Access

Effects of exposure to extremely low-frequency magnetic field of 2 μ T intensity on spatial memory and learning in mice

Morteza Kafaei^{1*}, Maryam Tehranipour¹, Alireza Haghpeima²

From 1st International Congress on Neurobiology and Clinical Psychopharmacology and European Psychiatric Association Conference on Treatment Guidance Thessaloniki, Greece. 19-22 November 2009

Background

Extremely low-frequency magnetic fields (ELFMF) have been reported to produce a variety of biological effects, interfere with the activity of the brain and may cause behavioral and cognitive disturbances. Some efforts have been made to investigate the incidence of ELFMF on human health and animal physiology and behavior. In the present study, we examined the effects of chronic exposure (1 and 2 weeks) to an extremely low-frequency magnetic field (ELFMF) of 2 μ T intensity on memory in rats using a Morris water maze.

Materials and methods

We examined the changes in spatial learning and memory by the Morris water maze test after 1 weeks of daily exposure of rats to a 10-Hz and 30-Hz magnetic field of 2 μ T for either 1 or 4 h.

Results

We found that chronic exposure to ELF MF reduced the latency to find the hidden platform and improved long-term memory of former location of platform without affecting motor activity.

Conclusions

These findings for the first time indicate that chronic exposure to ELF MF exerts a positive effect on the acquisition and maintenance of spatial memory.

Acknowledgements

The authors are grateful to Islamic Azad University of Mashhad, Iran for support.

Author details

¹Department of Biology, Faculty of Science, Islamic Azad University, Mashhad Branch, Mashhad, Iran. ²Department of Physics, Faculty of Science, Islamic Azad University, Mashhad Branch, Mashhad, Iran.

Published: 22 April 2010

References

1. Liu T, Wang S, He L, Ye K: Chronic exposure to low-intensity magnetic field improves acquisition and maintenance of memory. *Neuroreport* 2008, **19**(5):549-52.
2. Naomi MS, Jennifer MH, Shelly K, Kavaliers M, Frank S, Pratoa W: Analgesic and behavioral effects of a 100 μ T specific pulsed extremely low frequency magnetic field on control and morphine treated CF-1 mice. *Neuroscience Letters* 2004, 30-33.
3. Yu F, Cangkai W, Jianhong W, Yanlin L, Yuanye M: Long-term exposure to extremely low-frequency magnetic fields impairs spatial recognition memory in mice. *Physiology and Pharmacology* 2008, 797-800.
4. Hooge R, Deyn P: Applications of the Morris water maze in the study of learning and memory. *Brain Rev* 2001, **36**:60-90.

doi:10.1186/1744-859X-9-S1-S129

Cite this article as: Kafaei et al.: Effects of exposure to extremely low-frequency magnetic field of 2 μ T intensity on spatial memory and learning in mice. *Annals of General Psychiatry* 2010 **9**(Suppl 1):S129.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



¹Department of Biology, Faculty of Science, Islamic Azad University, Mashhad Branch, Mashhad, Iran