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Effects of exposure to low level radiofrequency fields on acetylcholine release in hippocampus of freely moving rats.

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Abstract

Some central cholinergic effects have been reported in animals after acute exposure to radiofrequency electromagnetic field at low intensity. We studied **acetylcholine** (ACh) release in the brain of freely moving **rats** exposed for 1 h during the day to a 2.45 GHz continuous wave radiofrequency field (RF) (2 or 4 mW/cm²) or exposed for 1 or 14 h during the night to a 800 MHz field modulated at 32 Hz (AM 200 mW/cm²). Measurements were performed by microdialysis using a membrane implanted through the upper CA1 region of the hippocampus. After irradiation with the 2.45 GHz RF, **rats** exposed at 2 mW/cm² did not show a significant modification of ACh release, whereas those exposed at 4 mW/cm² showed a significant 40% decrease in mean ACh release from hippocampus. This decrease was maximal at 5 h post exposure. Exposure to the 800 MHz RF for 1 h did not cause any significant effect, but exposure for 14 hrs induced a significant 43% decrease in ACh release during the period 11 p.m.-4 a.m. compared to control **rats**. In the control group we observed an increase of ACh release at the beginning of the night, which was linked to the waking period of **rats**. This normal increase was disturbed in **rats** exposed overnight to the 800 MHz RF. This work indicates that neurochemical modification of the hippocampal cholinergic system can be observed during and after an exposure to low intensity RF.

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