

The effects of paricalcitol on rat peripheral nerve following exposure to 1800 mhz electromagnetic fields

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Abstract

Objective: Widespread of wireless communication technologies (especially mobile phone and wireless internet usage) in all areas of daily life causes an increase in possible risks and problems about human health. There are some studies on the effect of electromagnetic field (EMF) on peripheral nerves. But results of these studies are contravertal. In this study, it was aimed to investigate the effect of 1800 MHz electromagnetic field on peripheral nerves and the role of paricalcitol which is an antioxidant.

Method: In experiments, GSM stimulator with 2W/m output power and 1800MHz frequency was used as a source of electromagnetic field. 28 adult rats were divided into four groups as G1 (control), G2 (for 30 days, three times a week, 0,02 µg paricalcitol), G3 (for 30 days, one hour a day EMF with 1800MHz) and G4 (for 30 days, one hour a day EMF with 1800MHz and for 30 days, three days a week 0,02 µg paricalcitol). Specific absorption rate (SAR) was calculated as 0,048 W/kg. Compound motor nerve action potential (CMNAP) was measured with electromyography, level of malondialdehyde and activity of catalase measured with biochemical methods, diameter of axone and myelin was measured by using histological techniques.

Results: In the EMF group (G3) the values of CMNAP amplitude was significantly lower and latency was significantly longer than the value of the other groups. ($p<0,05$). Score of G is calculated with diameter of axone divided by diameter of myelin, was less than the other groups ($p<0,05$).

Conclusion: In conclusion, it was observed that, the exposure of EMF with 1800 MHz for 30 days one hour a day, caused a damage like peripheral neuropathy by creating damage of axon and myelin on nerves. It was thought that, paricalcitol which is an antioxidant substance, may have a contribution in the recovery of this damage.

Keywords: Antioxidant, electromagnetic field, paricalcitol, peripheral nerve.