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Effects of 2. 45 GHZ electromagnetic field on development of teeth and surrounding tissues

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Aim: The aim of this study is to evaluate developmental effects of prenatal and postnatal exposure of 2. 45 GHz electromagnetic field (EMF) on teeth and its surrounding tissues.

Materials and Methods: This study was initiated with 24 pregnant Wistar albino rats after obtaining the necessary permits from The Ethical Committee of Suleyman Demirel University. Rats were divided into two groups as Control (n=12) and Experiment (n=12). Experiment group was exposed to 2. 45 GHz EMF for 2 hours in a day at pregnancy (21 days) and lactation (21 days) period. Also, offspring of these dams were exposed to EMF on lactation period. The exposure wasn't applied to control group (dams and offspring). 8 male offspring rats from each of the two groups were sacrificed under anesthesia when they were 7, 14 and 21 days old for the examination of development. Upper and lower jaw samples were examined histologically and immunohistochemically. In immunohistochemical examination for apoptotic activity caspase-3 (Anti-caspase-3 antibody (ab4051) Abcam, 1/50 dilution) was used.

Results: In samples which examined macroscopic, microscopic and immunohistochemical, there were no significant differences between the two groups in terms of development and apoptotic activity.

Conclusion: There was no difference in results of examinations between the experimental and control groups, suggesting that, exposed to 2. 45 GHz EMF 2 hours in a day does not interfere with development of teeth and surrounding tissues. However, EMF induced effects are not instantaneous such as chemical and environmental agents; they can be formed from the accumulation of cumulative interactions. Therefore nowadays, considering the increase of wireless networks use and duration of use, its sure that further studies including high number of subjects with longer-term exposure are needed.

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