Секция «Экспериментальные исследования»

Experimental study on the impact of radiofrequency electromagnetic fields on reproductive function

Научный руководитель – Фесенко Марина Александровна

Вуйцик Петр Александрович
Graduate (specialist)
Первый Московский государственный медицинский университет имени И.М. Сеченова, Москва, Россия
E-mail: pv1985@mail.ru

Radiofrequency electromagnetic fields (RF EMF) can negatively impact biological objects, different body systems and organs, including reproductive function [1]. Electromagnetic safety of the population has become a serious problem since the second half of the 20th century, and remains nowadays, since most of the population is affected by EMF of various frequencies and generation modes, the intensity of which is many times higher than the normal background [2].

The aim of the study was the evaluation of possible effects of whole-body RF EMF exposure on reproduction in pubescent male rats. We evaluated the effects of exposure to the 1890MHz DECT phone signal on the reproductive system of male rats to simulate the active use of the DECT phone during the whole work shift. The experiment was carried out in two sessions. During the first session animals were exposed to EMF in the near field of EMF source on a frequency of 1890 MHz, with power density (PD) being at $500\mu W/cm^2$, in the second session of experiment, exposure was run with two times less PD ($250\mu W/cm^2$). Exposure of one group of 12 animals was held for 10 days (5 days a week, three hours long). Study of radiofrequency electromagnetic field with power density at $500\mu W/cm^2$ proved that there is an impact on animals' reproductive system. The second week of exposure showed significant degrowth of seminal glands (mass coefficient 0,0073±0,00165, test groups - 0,0086±0,00079, $p<0,05$), the forth week also showed reducing trend in seminal glands mass gain. At the second week decline in osmotic resistance of sperm made 3,3±0,27% NaCl, test groups 4,9±0,44, $p<0,05$, by the forth week changes were even more evident (4,3±0,1% NaCl, test groups 3,5±0,1 $p<0,05$). There was also a tendency to lower sperm count in homogenate of epididymis swab in both groups. During the second session, after two weeks of exposure, (PD at $250\mu W/cm^2$) there were no statistically relevant dissimilarities. Up to the fourth week of exposure reproductive system changes were registered: statistically significant decline in osmotic resistance of sperm (3,9±0,07 % NaCl, test groups 4,17±0,05 $p<0,05$), as well as degrowth of seminal glands tendency. The group that underwent exposure for four weeks with a follow-on 2-week break revealed statistically important index of lower sperm count in homogenate of epididymis swab (66,73±6,04, test groups 88,27±5,34 $p<0,05$), as well as decline in osmotic resistance of sperm (3,77±0,07 % NaCl, test groups 4,19±0,08 $p<0,05$). The experimental data indicate a negative effect of the EMF frequency of 1890 MHz with PD 500 and 250 μW / cm^2 on the reproductive function of animals.

References

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