Effect of 35.5 GHz millimeter waves on reproductive parameters of male Wistar rat

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Abstract

The increased usage and wide application of millimeter waves(MMW) in different spheres of public domain makes it important to have a better understanding of any possible health impacts caused by them. Mobile communication 5G bandwidth and weather broadcasting radar works on millimeter waves. The aim of present study is to find out the effect of these radiation on reproductive system of male Wistar rat. Animals were divided into three groups Control, Sham-Exposed, and Exposed with 6 rats in each group. The experimental group was exposed to 35.5GHz frequency for 2 hrs/day for 60days in a specially designed anechoic chamber. At the end of exposure cauda epididymis and testis were excised out and various sperm parameters sperm count, viability, morphology, sperm mitochondrial activity was evaluated [1]. Testis morphometery (seminiferous tubular diameter and germinal epithelial height) were measured and histopathological analysis was done by johnson scoring. Ultrastructure analysis of sperm morphology was done by Scanning Electron Microscope (SEM). For oxidative stress analysis, Lipid peroxidation, FRAP assay, SOD, Total SH level were evaluated. For the DNA integrity comet assay was performed on testis. Results showed a statistically significant decrease in sperm count and sperm viability in exposed group animals.SEM analysis showed changes in sperm head morphology. Histopathological changes also showed significant changes in seminiferous tubules and alteration in spermatogenesis in exposed group. Lipid per oxidation in testis and sperm also showed a significant increase in exposed group. Further comet assay result also showed significant damage in exposed group. In conclusion results indicated that long term exposure to millimeters waves may affect male infertility.

Keywords: Millimeter waves (MMW), Radio Frequency Radiation (RFR),Wistar Rat**,** Oxidative stress.

References

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