



Effect of electromagnetic radiation exposure on fertility of male Wistar rat and protective role of herbal extract

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Advancements in telecommunication sector results in increasing exposure to electromagnetic radiation, which has been correlated with augmented incidence of male infertility (1). Therefore, the present study was aimed to analyze the effect of EM radiation (2115MHz) exposure on the reproductive system of male Wistar rats. Additionally, the possible antioxidant protective effect of herbal extract (pomegranate juice) was also evaluated. Pomegranate juice is known to be rich in vitamin C, polyphenolic compounds such as anthocyanins, ellagic, gallic acids which act as good antioxidant (2).

For experimental study animals were divided in five groups (control, sham exposed, exposed, herbal plus exposed and herbal only). Each group consist of 6 rats, animals were exposed to 2115MHz radiation for 45 days (2hrs/day). The animals were placed in a specially designed Plexiglas hexagonal cage and were exposed to above mentioned frequency in an anechoic chamber. The herbal treated groups were given 1ml of pomegranate extract orally. On completion of exposure time period, animals were sacrificed and body to organ ratio (testis, epididymis, prostate) was determined. Sperm count, motility, viability, testis histopathology and seminiferous tubular diameter were evaluated. Different Oxidative stress parameters such as SOD, GSH, TAC was measured. Free radical level (reactive oxygen and reactive nitrogen species) was determined by EPR spectroscopy. Sperm nucleus maturation and sperm DNA integrity was assayed by aniline blue staining and sperm chromatin structure method respectively.

Exposure to radiations did not induce significant changes in the body to organ weight ratio. However, the exposed group showed changes in sperm parameters such as decrease in sperm count, viability, motility and decrease in seminiferous tubules diameter. Additionally, significant alteration in oxidative parameters along with morphological changes was observed in exposed group of rats. No significant change in DNA structure was found in exposed group. On the other hand, herbal exposed group showed enhanced sperm count and increase in sperm motility and viability in comparison to exposed group. Similarly, testis histopathology results revealed the protective role of herbal juice. Likewise, EPR analysis suggested an enhanced free radical generation in exposed group of rats that was reduced in the herbal groups (both herbal plus-exposure and herbal only).

The study thus indicated that continuous exposure to mobile phone radiation can lead to oxidative stress which induces biochemical and morphological changes in rat sperms. However, pomegranate extract has a protective role against oxidative damage induced by exposure to radiation.

References

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