Time dependent effects of RF-EMR on Mouse Leydig Cell (TM3): In-Vitro study

Pooja Jangid[1], Umesh Rai[2], Rajeev Singh[1,3*]

1. Department of Environmental studies, Satyawati College, University of Delhi, Delhi-110052, India

2. Department of Zoology, University of Delhi, Delhi 110007, India

3. Department of Environmental science, Jamia Millia Islamia University, Delhi-110025, India

*Email- 10rsingh@gmail.com

ABSTRACT

With the advancement of modern technologies exposure to radiofrequency electromagnetic radiations (RF-EMR) has become inevitable, since humans are unable to avoid EMF sources including Wi-Fi, electric cables, microwave ovens, radios, telecoms, Bluetooth devices, etc,. These radiofrequency radiations have become a threat to human health and a major concern to male fertility. Thus, the current study focuses on the effects of cellular phone radiations on the male reproductive parameters including cell viability, cell proliferation, testosterone production, apoptosis, cell cycle, and ROS generation in a time dependent manner. Mouse leydig cells (TM3) were exposed to mobile phone radiations at different time points (15 min, 30 min, 45 min, 60 min, 90 min, 120 min), to examine the effects of radiofrequency radiation. Cell viability and ROS generation showed no statistically significant ($p<0.05$) effects. Whereas other parameters (cell proliferation, testosterone levels, apoptosis, cell cycle distribution) showed significant effects following irradiation. Cell proliferation rate was decreased at a considerable rate after 45 minutes of exposure. A similar trend was observed in case of testosterone levels and showed a significant reduction at 45 minutes and onwards following irradiation. On the other hand, a considerable rise in the number of apoptotic cells was seen after exposure at 60, 90, and 120 minutes. Additionally, leydig cell cycle distribution (Go/G1, S, and G2/M phases) was also found to be altered as compared to control. Hence, the findings of our study confirmed the negative effects of

radiofrequency electromagnetic radiations emitted from mobile phones on cell proliferation, cell apoptosis, testosterone production and cell cycle distribution, which could be a sign of inducing infertility in males.