



Assessment of Reproductive Toxicity of Nanosilver on Male Albino Mice

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FAYOUM UNIVERSITY

2022



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A thesis submitted in partial fulfillment

Of

The Requirements for the degree of

Master of Science

In

Embryology & Comparative Anatomy

Demonstrator of Zoology Department

Faculty of Science

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ABSTRACT

Aim: Regarding fast development of the nanotechnology and its various applications, the present study was carried out to estimate the potential toxic effect of silver nanoparticles (AgNPs) on the fertility of male albino mice.

Material and methods: For the study 35 adult male mice were randomly divided into 5 groups (7 mice per group) the first group (**GP1**) was the control group which was orally administered distilled water, the other 4 treated groups orally administered AgNPs at doses of 62.5 mg/kg (**GP2**) and 125 mg/kg (**GP3**) body weight for 35 days and then they were left for natural recovery (**GP4**) and (**GP5**) for 15 days and they were allowed to mate. Changes in the body or testicular weights, sperm analysis (sperm viability, motility, count and morphology), blood hormones (testosterone, LH & FSH), total antioxidant capacity and damage in epididymal sperm DNA (comet assay) were investigated. Morphometric measurements, histopathological and immunohistochemical (PCNA) examinations of testicular tissue were carried out. **Results:** AgNPs showed a potential reproductive toxicity as they were found to have negative physiological and histopathological effects on mice orally administered low and high doses (62.5 and 125 mg/kg, respectively) for 35 days. The histopathological and immunohistochemical changes that were observed in the testicular tissue of AgNPs treated mice along with the disturbance of the studied biochemical parameters and comet assay results are consistent with the disturbance in sperm parameters detected in all AgNPs treated mice. Conversely, mice in GP4 (recovery of low dose) showed a remarkable improvement that was noticed in the testicular histology, PCNA reactivity, biochemical parameters and comet assay results that became more or less similar to the control group comparing to the other AgNPs treated groups. **Conclusion:** The results of this study confirmed that silver nanoparticles have a toxic effect on male mice reproductive system that leads to male infertility with high doses.

Key words: silver nanoparticles (AgNPs), reproductive toxicity, testis, sperm analysis, comet assay, morphometric and PCNA.