

عنوان مقاله:

Detrimental effects of cerium oxide nanoparticles on testis, sperm parameters quality, and in vitro fertilization in mice: An experimental study

محل انتشار:

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خلاصه مقاله:

Background: Cerium oxide nanoparticles (CeOY NPs) as an important nanomaterial have a wide range of applications in many fields and human beings' exposure to this nanomaterial is unavoidable. The effects of CeOY NPs on the male reproductive system are controversial. Objective: To determine the effects of the administration of CeOY NPs on the testis tissue, sperm parameters, and in vitro fertilization (IVF) in mice. Materials and Methods: Twenty-four male mice were divided into three groups (n = λ /each): one control and two experimental groups receiving CeOY NPs at doses of ۵۰ and ۱۰۰ mg/kg body weight, respectively, for ۳۵ days. At the end of the experiment, the diameter of seminiferous tubules (SNTs), epithelial height of SNTs, spermiogenesis index in testes, sperm parameters (count, motility, viability, and morphology), sperm chromatin condensation, DNA integrity, and IVF assays were analyzed. Results: Histological results showed that the tubular diameter, the epithelial height of the SNTs, and the spermiogenesis index were significantly decreased in the experimental groups receiving CeOY NPs. All sperm parameters in the experimental groups were significantly reduced and, additionally, the percentages of immature sperms and sperms with DNA damage were significantly increased in groups treated with CeOY NPs compared to the control. Furthermore, the rates of IVF and in vitro embryo development were decreased. Conclusion: Collectively, the current study showed that oral administration of CeOY NPs in mice had detrimental effects on the male reproductive system through inducing testicular tissue alterations, decreasing sperm parameters quality, and also diminishing the IVF rate and in vitro .embryonic development

کلمات کلیدی:

Cerium oxide, Testis, Sperm, Fertilization, Mice., نانوذرات اکسید سریوم, بیضه, اسپرم, لقاح, موش.

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