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Study on the effect of *Spirulina platensis* on the histomorphometric and histological structure of rat testicular tissue exposed to iron oxide nanoparticles

Abbas Pirzadeh[1], Hassan Morovvati[2*] and Mohsen Abbasi[3]

[1] PhD Student of Histology, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
[2] Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
[3] Associated Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran

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Abstract

Repeated exposure to iron oxide nanoparticles can lead to structural disorders in the testicles and have negative effects on the individual's reproductive function. On the other hand, spirulina algae can reduce these effects by having antioxidant properties and abundant vitamin source. The purpose of this study was to investigate the effects of spirulina algae on tissue changes in the testes of rats induced using iron oxide nanoparticles. After acclimatization, 36 Wistar male rats were randomly divided into the following 6 groups. The first group: control, the second group: 15 mg/kg body weight of iron oxide nanoparticles, the third group: 300 mg/kg body weight of spirulina algae, the fourth group: 15 mg/kg body weight of iron oxide nanoparticles and 300 mg/kg algae body weight. spirulina at the same time, fifth group: 15 mg/kg of body weight of iron oxide nanoparticles for 14 days, then 300 mg/kg of spirulina algae, sixth group: 300 mg/kg of body weight of spirulina algae for 14 days, then 15 mg/kg of body weight of iron oxide nanoparticles. Sampling was done after 60 days and testicular bud sections were stained by hematoxylin-eosin (H & E) after preparation for histological and histometric studies. The study of tissue sections of the testis in rats exposed to iron oxide nanoparticles showed a decrease in the diameter of the spermatogenic tubules and the thickness of the epithelium of the spermatogenic tubules, a decrease in the number of Sertoli cells and the number of Leydig cells in comparison with the control group, while exposure to spirulina algae increased the diameter of the spermatogenic tubules and the thickness of the epithelium of the spermatogenic tubules. Algae treatment in the groups exposed to iron oxide nanoparticles improved the tissue changes in the testis and prevented the decrease in the diameter of the spermatogenic tubes, the thickness of the germinal epithelium, and the number of Leydig and Sertoli cells. The results showed that the oral administration of spirulina in male rats improves the structural disorders in the testis and tissue changes caused by induction by iron oxide nanoparticles.

Key words: Spirulina, Iron oxide nanoparticles, Testis, Rat

[*] **Corresponding Author**: Hassan Morovvati, Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran
E-mail: hmorovvati@ut.ac.ir

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