عنوان مقاله:

Effect oF TiO۲ Nanoparticles and Curcumin on Sperm Parameters in Response to Temperature-Induced Stress in Scrotal Hyperthermia Rats : Role of miR۴۵۵

محل انتشار:

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Background : Temperature changes cause testicular dysfunction. It has been observed that testicular hyperthermia leads to oxidative stress and as a result a severe reduction in testicular parameters. Causes a severe reduction in Sperm parameters to become oxidative due to stress. Recently, natural plant materials and magnetic nanoparticles have been considered. In the internal mitochondrial apoptosis pathway, gen bcl۲ is a target of miR۴۵۵. Objectives : The present study aimed to investigate the effects of titanium dioxide nanoparticles and improve their impacts by using the antioxidant curcuminonsperm parameters by investigating changes in expression miR۴۵۵ in response to temperature-induced stress in scrotal hyperthermia rats. Methods : After preparation, the rats were placed in a hot water bath at ۴۳ ℃. for ۳۰ minutes for six consecutive days. The rats were then divided into eight groups. We used TiO۲ nanoparticles at a concentration of ۰.۰۳ mg/kg of body weight and curcumin at a concentration of ۰.۰۲mg/kgof body weight. After killing the animals, such parameters of sperm as viability, concentration, motility, and morphology of spermatozoa were studied. RNA extraction and cDNA synthesis were performed using appropriate kits. A gene primer was designedandRT-PCR was used to assess gene expression. The t-testandANOVAwere used to examine differences between different groups. Data analysis was performed using Prism۸ software and SPSS version ۲۶. Results : The results showed that miR۴۵۵ expression was lower in the treatment groups and was associated with curcumin ($P < ۰.۰۵$). A positive effect of curcumin on improving sperm parameters in rats with scrotum hyperthermia and a negative and toxic effect of TiO۲ nanoparticles were shown. However, a significant improvement in sperm parameters was observed when rats were given TiO۲ nanoparticles along with curcumin. Conclusions : The changes in the expression miR۴۵۵, shown in curcumin have controlled the damage to TiO۲ nanoparticles. It seems that miRNA۴۵۵ can be used as a marker to predict sperm health status. So .Curcumin can play a protective role in reducing the toxic effects of testicular hyperthermia as well as titanium dioxide nanoparticles

کلمات کلیدی:

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