Comparison the effects of ZnO with ZnO nanoparticles on the hepcidin gene expression in rat liver

Background and objective: Nanoparticles have properties such as increasing of intestinal absorption , permeability, endurance, solubility and drug delivery to lesion place. Among of nanoparticles, zinc nanoparticle is widely applicable in medicine such as disinfectants and drug production. Performed studies on zinc nanoparticles indicated the role of these particles in increase and decrease of some genes expression that have important role in reproduction and cell division processes. According to main role of hepcidin hormone in anemia or its role in iron overload diseases, we decided to inspect about effect of zinc oxide on hepatic hepcidin expression until we help to find some ways to improve these diseases.

methods: In this experimental study, 24 Wistar male rats divided to three group each eight: 1- control group, 2- group that received zinc oxide and 3- group that received zinc oxide nanoparticles. both of receiving group delivered intraperitoneal injection of zinc oxide and zinc oxide nanoparticles (50 mg/kg) for 14 days. At the end of study, blood samples collected to measure serum iron capacity, ferritin and IL6 and finally, samples of liver tissue separated and maintained to extract RNA .

Results: The finding results show that the dense shape and the shape of zinc oxide nanoparticle increase hepcidin gene expression than normal control group significantly, although this effect in nanoparticle more considerable than dense shape.

Conclusion: The shape of zinc oxide nanoparticle in comparison with dense zinc oxide has more effect on hepcidin gene expression.

Key words: hepcidin, zinc oxide, zinc oxide nanoparticle, rat