

عنوان مقاله:

Evaluation of cystatin-C by ELISA assay in rats with diabetes mellitus supplemented by zinc oxide nanoparticles

محل انتشار:

بیستمین کنگره ملی و هشتمین کنگره بین‌المللی زیست‌شناسی ایران (سال: 1397)

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خلاصه مقاله:

Diabetes mellitus is a metabolic disorder with an essential property in increasing plasma glucose that finally extra glucose is excreted by urine and ends up losing an important source of energy. In this disorder metabolism of lipids and proteins are disturbed as well. In the present study effects of oral administration of zinc oxide nanoparticles (ZnO-NPs) in different doses were assessed on diabetes mellitus compared with control rats. 120 Wistar male rats were randomized into two groups, healthy and diabetic rats ($n=60$). The diabetes was induced intraperitoneal by using streptozotocin in a dose of 45 mg per each kg of weight mass. Rats were attendant by ZnONPs with (1-3-10) mg dose and a blood sample was taken in 7-7-56 days and these levels measured in the mentioned days. Glucose level by using the enzymatic colorimetric method, Insulin by ELISA, Cystatin-c by Latex Enhanced Immunoturbidometric, creatinine by an enzymatic colorimetric method without elimination of proteins were assayed. Statistical analyses were performed using SPSS Version 22. Normalization of data were performed using Kolmogorov-Smirnov and Tukey's test and the level of significance was set ($p<0.05$). The results of the present study showed that oral administration of ZnO-NPs in various doses significantly decrease in glucose, urea, creatinine and cystatin-c levels and significant increase of insulin in comparison with control group ($P<0.01$), most alteration in compare to other groups was observed in diabetic rats that administrated by ZnO-NPs 10 mg. Induction of diabetes mellitus along with oxidative stress induction resulted in nephropathy in rats. This was accompanied by an increase in urea, Cystatin-c. Administration of ZnO-NPs reduced blood glucose levels and inhibited oxidative stress, hence, prevented renal failure in rats.

کلمات کلیدی:

Diabetes, Nephropathy, Zinc oxide nanoparticles, Cystatin-c

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