

Effects of Experimental Induction of Diabetes Mellitus in Male Albino Rats on Blood Concentration Levels of Some Hormones

Summary and conclusion:

Diabetes mellitus (DM) is a metabolic disease involving altered ability to metabolize glucose. A common secondary effect of diabetes is reproductive dysfunction. It has been reported that spontaneously and experimentally induced DM in male rates are often accompanied by a marked decrease in reproductive functions. The aim of the present study is to investigate the possible effects of experimentally induced diabetes (untreated and after insulin treatment) on the serum levels of total and free testosterone and pituitary gonadotrophins (LH and FSH) for 2, 4, 6 and 8 weeks duration. Moreover correlation of these parameters with histopathological effects on testes were studied.

Materials and Methods:The study was conducted on 72 male adult albino rats as following: group I (8 rats normal control) , group II (32 untreated diabetic rats, injected 50mg/ kg STZ once IP) and group III (32 daily insulin treated diabetic rats, injected insulin 1 IU/ day subcutaneously 72 hours after diabetes mellitus induction), each of the last two groups were sub-classified into 4 subgroups: IIa, b, c & d and III a, b, c, d that were 2, 4, 6 and 8 weeks duration of untreated and insulin treated subgroups respectively. At the end of duration of each subgroups a retrobulbar blood samples were taken for measuring serum levels of glucose, insulin, free and total testosterone, and gonadotrophins, also excision of testes for histopathological examination was done.

Results: In comparing to normal control the results of untreated diabetic rats showed significantly high glucose and low insulin, total and free testosterone, LH & FSH; while insulin treatment significantly ameliorates these results in all subgroups except in 2 weeks one. Meanwhile, comparison between subgroups showed that results of 6 and 8 weeks duration had significant changes than that of 2 and 4 weeks with no significant difference between the last two subgroups. The histopathological results showed focal hypospermatogenesis; an effect that increased gradually by increasing diabetes duration meanwhile, insulin treatment showed mild improvement of these testicular changes.

Conclusion: The study can proposed that the probable mechanism underlying the suppressant effect of diabetes mellitus on the process of steroidogenesis and spermatogenesis is mainly most probably through inhibition of pituitary gonadotrophines release; an effect which is most probable due to inhibition of release of hypothalamic GnRH. It seems that the gradual feature of these diabetic dysfunction were dependent on the degree and duration of the disease, this can explained by short- time exposure of animals to the disease (2 weeks duration) was unable to trigger apparent changes on pituitary gonadotrophines and testicular function.