Histopathological evaluation of exogenous oxytocin on Streptozotocin (STZ)-induced diabetic adult rat testes

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Diabetes Mellitus is a chronic metabolic disease which lasts for whole life, requiring continuous follow-up and therapy. It decreases patients' lifespan and the quality of life, causes a high morbidity and mortality rate and is a high-cost disease with acute and chronic complications. As well as, diabetes is a factor that causes infertility, due to the decrease in testicular weight, the degeneration of spermatogenic cell series, the decrease in the number of sperm with testicular atrophy in the seminiferous tubules and the reduction of sperm motility. Oxytocin is a hormone that causes the contraction of smooth muscles especially in uterus, and it is also known as an antioxidant in several organs [1, 2]. The aim of this study is to investigate the therapeutic and protective effect of oxytocin treatment on testicular tissue in diabetic rats, induced by streptozotocin (STZ).

Wistar Albino rats were randomly divided into four groups, each as follows: 1) Control group (n: 6): 0,3 ml of saline solution was injected intraperitoneally (ip), 2) STZ group (n: 6): single dose of STZ (65 mg/kg) was injected ip, 3) Preoperation-Oxytocin group (n: 6): 5 µg/kg of oxytocin was injected ip before single dose of STZ injection, 4) Postoperation-Oxytocin group (n: 6): 5 µg/kg of oxytocin was injected ip following single dose of STZ injection. Intraperitoneal oxytocin injections were applied for 5 consecutive days after or before the STZ injection. Animals were kept under normal conditions of feeding with available food/water for four weeks following STZ injection. Blood samples obtained from tail were measured by glucometer at the beginning and once a week during the whole experiment. The diabetic rats whose blood glucose level was more than 200 mg/dl were included to the experiment. At the end of the 4th week, rats were sacrificed and blood samples from tail-vein were collected. Tissue sections were stained with Haematoxylin-Eosin (H&E) to evaluate the testicular structure at light microscopic level. The degree of injury, based on seminiferous tubules was evaluated as: normal, regressive, degenerative and atrophic. Each criterion was scored by using a scale ranging from 0 to 3 (0: none; 1: mild; 2: moderate; and 3: severe).

A normal morphology of seminiferous tubules with regular spermatogenic cells was observed in the control group, while degenerative and atrophic seminiferous tubules were prominently increased in STZ group. Oxytocin treatment led to a decrease in testicular tissue damage which was more prominent in Preoperation-Oxytocin group compared to the Postoperation-Oxytocin group.

In conclusion, the present study depicts therapeutic and protective effects of oxytocin on STZ-induced diabetic rat testes, as protective effect of oxytocin being more significant than its therapeutic effect.

References

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