The Effect of Oxytocin on Stres-Induced Urinary Bladder Injury: Oxidative Stress and Mast Cells

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Objective: In this study, we aimed to study the impact of oxytocin therapy on water avoidance stress model in rats.

Methods: Sixty Wistar rats were assigned into 5 groups and each group included the equal numbers of male (n=6) and female (n=6) rats. Group 1 (control): had no intervention, Group 2 (oxytocin): received 5μg/kg oxytocin subcutaneously for 5 days, Group 3 (chronic stress): underwent 2 hour daily water avoidance stress (WAS) for 5 days, Group 4 (chronic stress+recovery): underwent chronic stress followed up without stress for the next 5 days and Group 5 (chronic stress+oxytocin): received 5μg/kg oxytocin subcutaneously during chronic stress. Urinary bladder tissues were examined under light and electron microscopy. Expression and localization of caveolin-1 in urinary bladder were determined by immunohistochemistry and western blot analyses.

Results: While both male and female rats in chronic stress group revealed significantly higher levels of serum cortisol and markers of oxidative stress when compared to the controls, chronic stress + oxytocin group revealed significantly lower levels of serum cortisol and markers of oxidative stress when compared to the chronic stress. As the number of both granulated and degranulated mast cells in female rats of the chronic stress group was prominently increased with respect to controls, it was significantly decreased in female rats of the chronic stress+oxytocin group. Expression and localization of caveolin-1showed no significance among groups.

Conclusion: Histological results of our study revealed that oxytocin application limits the degenerative alterations related to chronic stress in both male and female rats.

Key words: Caveolin-1, histology, immunohistochemistry, oxytocin, water avoidance stress