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THE EFFECT OF OVARIECTOMY AND ESTRADIOL REPLACEMENT ON STEREOLOGICAL ANALYSIS OF THE MUSCLE AND CONNECTIVE TISSUE IN THE BLADDER OF RATS

Aims Of Study

Estrogen receptors have been detected in the urethra, bladder tissues and in the pelvic floor muscles of animals[1] and humans[2]. These observations have led to the hypothesis that hypoestrogenism plays a role in urethral and bladder dysfunctions. Evidence has been found of the direct influence of estrogen on bladder function and structure[3]. However the results obtained are contradictory and the hormonal effect is more evident in the urethra[4]. We carried out quantitative morphometric analysis of rat bladders to investigate the possible effects of ovariectomy and successive estrogen replacement therapy on bladder wall structure.

Methods

This study was conducted on 60 Wistar rats (three months old). Group 1: remained intact; Group 2: underwent bilateral ovariectomy and were sacrificed after 30 days; Group 3: sham operated and sacrificed after 30 days; Group 4: underwent bilateral ovariectomy and after 30 days daily replacement of 17β-estradiol for 90 days (5 microgramas per day for 12 weeks); Group 5: sham operated and after 30 days daily replacement of sesame oil for 90 days (0,2 ml per day, s.c, for 12 weeks). Group 6: underwent bilateral ovariectomy and after 30 days daily replacement of sesame oil for 90 days. Sirius red was used to stain tissue on paraffin rat bladder sections. The M-42 grid system was used to quantitatively analyze the fibers. The Kruskal-Wallis nonparametric test was used to test the differences in the stereological findings of the six groups. A probability of $p < 0,05$ was used as the criterion of significance.

Results

A quick examination showed that there were no major differences in the thickness and macroscopy of the control bladders and ovariectomized bladders with or without estradiol replacement. Ovariectomy as well as ovariectomy followed by estradiol treatment had no effect on bladder volume. A comparison of the stereological findings of the six groups showed no significant differences in the absolute volume ($p= 0,32$) and volumetric density ($p=0,20$) of the connective tissue. Analysis of the muscle system showed that there were no significant differences in the absolute volume ($p=0,27$) and volumetric density ($p=0,10$) of the groups.

Conclusions

The conclusion reached is that estrogen depletion had no effect on extracellular matrix and muscle fibers concentration in the bladder wall of rats. Estrogen treatment did not influence any of the parameters studied.

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