**1032**

Magaldi F[1], Moreno de Freitas M[1], Magaldi C[1], E.A.Lima N[1], M.Cafarchio E[2], L.A. Fonseca F[2], Sato M[2], B.M.Maifrino L[1]

***1.*** *Universidade São Judas Tadeu,* ***2.*** *Faculdade de Medicina do ABC*

# ANALYSIS OF EXPRESSION OF METALOPROTEINASES 2, 9 AND TIMP1 IN THE URINARY BLADDER OF EXERCISED MULTIPAROUS AND OVARIECTOMIZED RATS

Hypothesis / aims of study: Urinary incontinence is a manifestation of multifactorial origin, and can be caused by several situations such as: childbirth, gynecological surgeries, weakened pelvic support, tissue laxity, bladder or uterine prolapse and menopause. It is known that estrogen affects the metabolism of collagen and that hypoestrogenism interferes with connective tissue metabolism, and that estrogen receptors are found in both the lower urinary tract. The objective of the present study was to evaluate the urinary bladder remodeling in multiparous and ovarectomized rats submitted to moderate acute resistance training.
Study design, materials and methods: We used female Wistar rats (~ 240 g at the beginning of the experiments, N = 6 / group) divided into 3 groups: control, ovariectomized (OVx) and multiparous. Rats of the OVx group underwent the bilateral ovary withdrawal through an abdominal midline incision under ketamine and xylazine anesthesia and were submitted to exercise after 30 days. The resistance exercise consisted of climbing a 1-meter-high ladder inclined at 85o five times with 75% body weight load, three times a week for one week. The sedentary control, multiparous and OVx rats did not carry out any exercise and were maintained in the same room during the experiments. After the end of the exercise, the animals were euthanized and the urinary bladder was collected. The preparation of the material was done through conventional histology techniques stained in Picrosirius red for collagen and immunohistochemical analyzes to verify the expression of MMP2, MMP9 and TIMP1..
Results: The multiparous and OVx groups showed increase of the collagen fibers, and sub expression of MMP2, MMP9 and TIMP1 when compared to the control group. We found that the collagen fibers in the multiparous and OVx groups did not present a significant difference when compared to the sedentary groups. We did not verify alteration of MMP2 expression in the studied groups. As for MMP9, we found a lower expression in the group of multiparous rats compared to sedentary rats. On the other hand, the exercised OVx animals showed a tendency to increase the expression of MM9 when compared to the sedentaries. We found that the resistance exercise has a tendency to reduce the expression of TIMP1 in multiparous groups and significantly in OVx groups in comparison to sedentaries.
Interpretation of results: We found collagen increased in both multiparous and OVx groups and that acute resistance exercise reversed this process. Regarding the profile of MMP2, MMP9 and TIMP1, we found a sub expression in the exercised animals when compared to the sedentary ones.

Concluding message: According to the results presented, we suggest that resistance exercise can be used as a non-pharmacological treatment in both multiparous and ovariectomized animals.

Disclosures
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