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Poster Presentations

P-1
Effects of maternal voluntary wheel running during pregnancy on the neonatal rat ovary

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Background: Regular maternal exercise in pregnancy enhance the physiological, metabolic, and psychological health of mother and fetus. Probing the effects of maternal exercise in gestation, on the developmental programming of pups all over intrauterine and postnatal life, is known as a novel and favorable research field.
Objective: The purpose of the present study was to evaluate the effects of maternal voluntary wheel running during mid or late gestation on rat neonatal estrogen and progesterone plasma concentration; ovarian development and its angiogenesis; and development of the primary oocyte, primordial follicle, and their apoptosis.
Materials and Methods: 21 female Wistar rats were accidentally distributed into experimental groups (doing exercises during the 2nd and 3rd wks of pregnancy, n = 14) and control (n = 7). In the exercise groups, each rat had access to a running wheel (diameter = 34.5 cm, width = 9.5 cm) that was embedded in their cage and during the 2nd and 3rd wk of pregnancy, it rotated freely during the resistance of 100 g. In this regard, it is notable that each wheel was linked to a counter that recorded its rotations. Pregnant rats in the control group were put in the cages without any access to a running wheel. After birth, the neonate's blood was obtained and the estrogen and progesterone concentration were evaluated. Thereafter, the ovaries were removed and used for histological investigations and apoptic assessment.
Results: A significant increase was found in estrogen and progesterone concentration in neonates of experimental groups (p = 0.001). The experimental groups had an increased ovarian diameter (2ndW: p = 0.044 and 3rdW: p = 0.005) and angiogenesis (2ndW: p = 0.003 and 3rdW: p = 0.001). In addition, significant enhances were seen in the number (2ndW: p = 0.017 and 3rdW: p = 0.035) and diameter (2ndW: p = 0.046 and 3rdW: p = 0.004) of primordial follicles as well as in the diameter of primary oocytes (2ndW: p = 0.037 and 3rdW: p = 0.019) of the experimental groups compared to the control group. Moreover, maternal voluntary wheel running reduced the number (2ndW: p = 0.001 and 3rdW: p = 0.001) of apoptotic primordial follicle in the experimental groups compared to the control group.
Conclusion: It was shown that maternal voluntary wheel running of the pregnant rats during mid or late gestation increase estrogen and progesterone plasma concentrations, and ovarian size and its angiogenesis in neonates. Furthermore, this type of exercise increases the primordial follicle/primary oocyte numbers and diameters as well as oocyte nuclei, while inversely decreases the numbers of apoptotic primordial follicles.
Key words: *Apoptosis, Exercise, Neonatal, Ovary, Rat.*

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