

عنوان مقاله:

Maternal treadmill exercise ameliorates impairment of neurological outcome, caspase-1 and NLRP3 gene expression alteration in neonatal hypoxia-ischemia rats

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خلاصه مقاله:

Objective(s): Neonatal hypoxia-ischemia (HI) is one of the most important causes of neurological disorders in children. Various studies suggest that maternal exercise during pregnancy has a beneficial impact on the health status of offspring infants. In this study, the effect of maternal treadmill exercise during pregnancy on neurological and molecular changes induced by HI in newborn rats was investigated. **Materials and Methods:** In this experiment, 24 pregnant female rats were divided into two groups; the first group was subjected to treadmill exercise for six weeks. The treadmill exercise program was initiated by running for 17 min at 5-10 m/min at 0° inclination in the first week, followed by running for 21 min at 5-25 m/min at 5° inclination in the second week, running for 25 min at 5-30 m/min at 10° inclination in the third and fourth weeks, running for 25 min at 5-15 m/min at 10° inclination in the fifth and sixth weeks. The second group was left untreated and did not perform the exercise. Newborn rats were assigned to four groups; (1) control, (2) control+exercise, (3) HI, and (4) HI+exercise. HI was developed in the offspring on the 1st postnatal day. One week following the induction of HI, the Garcia test was carried out. The histological morphology of neonates was assessed, and the expression levels of caspase-1 and NLRP3 were evaluated. **Results:** The data showed that maternal exercise during pregnancy significantly improved neural cell death ($P<0.001$) and the Garcia score ($P<0.05$), while it attenuated the expression levels of Caspase-1 ($P<0.001$) and NLRP3 ($P<0.05$) genes in newborn rats induced by HI. **Conclusion:** These results demonstrated that maternal treadmill exercise during pregnancy could reverse the neurological deficits, as well as the expression levels of caspase-1 and NLRP3 genes, which occur in neonatal hypoxia-ischemia.

کلمات کلیدی:

Brain Hypoxia-Ischemia, Caspase-1, Infant, NLRP3, pregnancy, Rats, Treadmill

لینک ثابت مقاله در پایگاه سیویلیکا:

