



Exercise Biochemistry Review

Proceedings of IBEC 2018, Beijing, China, October 23-25
PO-143

Effects of treadmill exercise on the expression of corticostriatal mGluRs in hemiparkinsonian rats

Kaixuan Shi¹, Xiaoli Liu², Decai Qiao²
1.China University of Geosciences
2.Beijing Normal University

Objective Exercise therapy has been widely used for the clinical treatment of Parkinson's Disease (PD). However, the rehabilitation mechanisms involved remain clear. mGluRs play an important role in the progression of PD. In this study, immunohistochemistry and western blot analyses were used to detect the expression of presynaptic corticostriatal mGluR2/3 and postsynaptic mGluR5, and we attempted to investigate the molecular basis of the reconstruction of functional connectivity in the corticostriatal pathways from a mGluR perspective.

Methods Male SD rats (230–250 g) were used as subjects in this experiment. After 1 week of habituation, the rats were randomly assigned to three groups: control group (Control, n = 24), PD group (PD, n = 24) and PD with exercise group (PD + Ex, n = 24). The experimental models were prepared by unilateral injection of 6-hydroxydopamine (6-OHDA) (2 µg/L, 8 µg) into the medial forebrain bundle, and the control group was administered an equivalent dose of saline solution. The models were evaluated with the apomorphine (APO)-induced rotation test. Two weeks postoperatively, exercise intervention was applied to the PD + Ex group for 4 weeks. Immunohistochemistry and western blot analysis were used to evaluate the expression of presynaptic corticostriatal mGluR2/3 and postsynaptic mGluR1/5.

Results Results showed that the PD + Ex group had a significantly higher level of mGluR2/3 expression ($P < 0.01$) and significantly lower level of mGluR1/5 expression ($P < 0.05$) compared with the PD group.

Conclusions Exercise intervention significantly increased the expression of mGluR2/3 and simultaneously reduced the expression of mGluR5, indicating that mGluRs can improve the behavioral function of PD rat models through exercise, and that the reconstruction of the functional connectivity of corticostriatal pathways plays an important role in nervous system regulation.