Original Paper

Neuroprotective effect of aerobic training against Lead-induced oxidative stress in rat cerebellum

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Abstract

Background and Objective: Oxidative damage associated with the presence of Lead in the brain has been proposed as one possible molecular mechanism involved in Lead toxicity. Aerobic exercise is known to protect the brain through a cascade of molecular and cellular processes. The purpose of this study was to investigate the effect of 8 week aerobic training on the brain-derived neurotrophic factor (BDNF) and malondialdehyde (MDA) levels in rat's cerebellum exposed to Lead acetate.

Materials and Methods: In this experimental study, 40 Male Wistar rats were randomly allocated into four groups: sedentary base, sham (30 mg/kg of ethyloleate), Lead and exercise+Lead (20 mg/kg Lead acetate, intraperitoneally). The exercise program consisted of progressive running training on the treadmill for 15 to 22 m/min, 25 to 64 min/day, and 5 days/week for 8 weeks. BDNF and MDA levels were measured by ELISA and TBARS methods, respectively.

Results: Chronic Lead acetate administration enhanced significantly ($P<0.05$) cerebellar MDA levels in rats compare to base and sham groups but had no effect on BDNF levels. Cerebellar MDA significantly was reduced and BDNF non significantly was increased in Lead acetate+ training group.

Conclusion: Regular aerobic exercise with moderate intense may exert role neuroprotective against Lead-induced cerebellar injury by down-regulating oxidative stress and promotes brain health through increases in BDNF.

Keywords: Aerobic training, Lead, Oxidative stress

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