Parkinson disease-induced upregulation of apoptotic mediators could be attenuated in the skeletal muscle following chronic exercise training

Short title: Impact of exercise on apoptotic mediators in PD skeletal muscle

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Abstract

BACKGROUND: We have shown elevated levels of p53 and active caspase-3 in gastrocnemius skeletal muscle with Parkinson's disease (PD). The main aim of this study is to examine the impact of endurance exercise training on the expression of p53 and active caspase-3 in the skeletal muscle of mouse with induced Parkinsonism.

METHODS: Sedentary control (SC), sedentary Parkinson diseased (SPD), and exercised Parkinson diseased (EPD) groups were formed; each consisting of 10 randomly selected normal albino mice. Chronic Parkinson disease was induced in the SPD and EPD animals using 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine and probenecid (MPTP/p). The expression of p53 and active caspase-3 was investigated, using immunohistochemistry, in the gastrocnemius muscle in each animal group.

RESULTS: Both p53 and active caspase-3 expression was significantly (p value < 0.05) reduced in the PD gastrocnemius skeletal muscle following endurance exercise training.

CONCLUSION: Our present data suggest that chronic exercise training reduced Parkinson disease-induced upregulation of p53 and active caspase-3 in gastrocnemius skeletal muscle. Thus, our study suggests that inhibiting p53 and/or active caspase-3 may be considered as a therapeutic approach to ameliorate PD skeletal muscle abnormalities.

Keywords: Parkinson disease, MPTP, skeletal muscles, active caspase-3, p53, exercise.