



Hippocampus CASPASE3, FOXO1, BDNF expression levels changes after progressive resistance training in diabetic rats

Oral Presentation

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Abstract

Introduction: Diabetics have many disabilities, including the neuronal damage hippocampus, which can be assessed with apoptotic factors such as caspase-3 and Foxo-1, and BDNF is an effective factor in this field. This factor has the most impact on the hippocampus; also, TNF- α is an inflammatory factor that increases in diabetes; the purpose of this study was to investigate the effect of 6 weeks of progressive resistance training on the gene expression of BDNF, FOXO1, CASPASE3 in the hippocampus of male Wistar rats.

Methods: For this study, 36 male Wistar rats (4 weeks old) with 150 ± 10 g weight were categorized into 3 groups (n= 12) of diabetic rats, exercise diabetic, and control. For induction of diabetes, peritoneal injection of STZ solution (50 mg/kg) was used. After a week of familiarization with the environment and practice, Progressive Resistance Training was performed in a 6-weekly 3-session, climbing the vertical ladder, with 50%, 75%, 90%, and 100% the animals' bodyweight. After successful completion, 30 gr were added to the weights to the extent that the rats could not carry the ladder. 24 hours after completing the exercise, the functional test was taken, and the animals were autopsied 48 hours after the functional test. Finally, FOXO1, CASPASE3, BDNF gene expression were evaluated using the Real-Time PCR technique.

Results: Regarding the results, it was found that the Progressive Resistance Training intensified the expression of the BDNF gene and decreased the expression of the FOXO1 gene and the TNF- α protein, CASPASE3 gen, but it was not significant in the expression of the CASPASE3 gene. Also, the weight gain of the hippocampus has been observed along with increased expression of the BDNF gene in the diabetic Progressive Resistance Training group.

Conclusion: Exercise can help prevent hippocampus tissue loss and also prevent memory damage caused by diabetes.

Keywords

Progressive Resistance Training; TNF- α ; BDNF; CASPASE3; FOXO1

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