

Eccentric Exercise Decrease Blood Glucose Level and Improve Protein Level of Glucose Transporters in Diabetic Mice Muscle

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ABSTRACT

Background: Previously, eccentric exercise improved on blood glucose level better than concentric and isometric exercise. The improvement of blood glucose level was resulted from higher glucose uptake activity, particularly at the muscles. Unfortunately there isn't yet information whether it is facilitated by glucose transporter type 1 or glucose transporter type 4.

Objective: The aim of the present study was to investigate the effect of eccentric activity on glucose transporter type 1 and glucose transporter type 4 in gastrocnemius muscle of streptozotocin-induced diabetes mellitus mice.

Methods: Diabetic mice were grouped randomly into 4 groups (7 mice each group). Two groups were observed during fasting and others were observed during post prandial. Single bout of eccentric activity was given by downhill running on 10° degree decline treadmill. The protein level of glucose transporters were measured using monoclonal antibody in ELISA protocol. Blood glucose level was measured on fasting and post prandial using colorimetric protocol of EASY TOUCH app.

Results: Glucose levels (fasting and post prandial) of eccentric group were significantly lower than isometric group. Consistently, protein level of glucose transporters (type 1 and type 4) were significantly higher than isometric group. Type-4 glucose transporter level was higher than type-1 glucose transporter, found in calf muscle.

Conclusion: single bout of eccentric exercise on downhill running improve blood glucose level due to both GLUT-1 and GLUT-4 protein levels improvement.

Keywords: *exercise, glucose transporter, diabetes mellitus, streptozotocin, muscle*