

**ABSTRACT**

Effect of Eccentric Exercise of GLUT-1 Expression  
on Diabetic Mice Gastrocnemius Muscle Inducted by Streptozotocin

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Diabetes Mellitus is a disease with characterized by an increasing glucose level in the blood (hyperglycemia). Physical exercise for people who suffer from DM has an important role in controlling blood glucose level in blood. Eccentric muscle contraction can stimulate translocation and the expression of GLUT-1 to cell membrane, which has as role to facilitate the glucose entrance into the cell. However, the influence of eccentric exercise to increase GLUT-1 expression on cell membrane has not been clearly known. The purpose of this research is to prove that eccentric exercise can increase the amount of GLUT-1 expression in the gastrocnemius muscle of diabetic mice. The research method used is the randomize posttest only kontrol group design. The trial animal used in this research are 8-12 weeks-male mice, body weight between  $25 \pm 2$  grams. The total amount of 27 trials animals were divided randomly in to 3 groups, normal-control group (K0), diabetic-control group (K1), and diabetic-group with treatment (K2). K1 and K2 were inducted with *streptozotocin*. K0 and K1 undergone no treatment. K2 underwent eccentric exercise treatment. The exercise was done using a treadmill with as slope angle of -10 degrees (*running downhill*). The time period of exercise was 16 minutes 30 seconds with as speed of 21 cm/second. Fasting blood glucose (GDP), post prandial blood glucose (GDPP), and GLUT-1 were taken from each trial group. The mean GLUT-1's of K2 ( $3.04/\mu\text{m}^2$ ,  $SD=0.68$ ) is higher than that of K1 ( $1.88/\mu\text{m}^2$ ,  $SD=0.20$ ) ( $p=0.001$ ). Analysis shows a significant difference between GLUT-1 of K1 and K2 ( $p=0.001$ ). This is an evidence the amount of GLUT-1 expression on cell membrane of eccentric exercise are much higher than that without eccentric exercise. In conclusion, eccentric exercise increases glucose uptake in muscles, hence it improves the blood glucose level.

**Keywords:** diabetes mellitus, eccentric exercise, GLUT-1.