

## Original Paper

# Effect of exercises downhill and uphill running on serum Adiponectin and Glucose in type-2 diabetic patients

Hajihassani AH (PhD)<sup>1</sup>, Bahrpeyma F (PhD)<sup>\*2</sup>, Bakhtiari AH (PhD)<sup>3</sup>, Taghikhani M (PhD)<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Physiotherapy, Faculty of Rehabilitation, Semnan University of Medical Science, Semnan, Iran. <sup>2</sup>Assistant Professor, Department of Physiotherapy, Faculty of Medicine, Tarbiat Modares University, Tehran, Iran. <sup>3</sup>Professor, Neuromuscular Rehabilitation Research Center, Semnan University of Medical Science, Semnan, Iran. <sup>4</sup>Professor, Department of Biochemistry, Faculty of Medicine, Tarbiat Modares University, Tehran, Iran.

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## Abstract

**Background and Objective:** Adiponectin is an adipocyte-secreted hormone. Low levels of Adiponectin may indicate the insulin resistance and development of diabetes. The regular exercise therapy induces insulin resistance to be reduced. Glucose uptake increase in muscles, increased adiponectin levels and decreased of HbA<sub>1c</sub> in diabetic patients. This study was designed to evaluate the effect of down-hill and up-hill running exercises on the adiponectin and serum glucose in type-2 diabetic patients.

**Materials and Methods:** This clinical trial study was conducted on 28 patients (13 male and 15 female), age 40 to 60 years, with type-2 diabetes, in neuromuscular rehabilitation research center, Semnan, Iran during 2009. Participants were assigned randomly in one of the two experimental groups, eccentric or concentric exercise using treadmill. Before and after control and intervention period, glucose, HbA<sub>1c</sub> and adiponectin serum were measured in both groups. Data were analyzed using SPSS-18, Kolmogorov-Smirnov, Repeated Measures ANOVA, Tukey and independent t tests.

**Results:** Eccentric and concentric exercise significantly decreased glucose, HbA<sub>1c</sub> and also increased adiponectin levels ( $P < 0.05$ ) in type-2 diabetic patients. However, eccentric exercise also significantly reduced glucose and HbA<sub>1c</sub> and increased adiponectin levels compared to the concentric exercise ( $P < 0.05$ ).

**Conclusion:** This study showed that eccentric exercise are more effective than concentric exercise to reduce and control the blood glucose level and improve serum adiponectin in type-2 diabetes mellitus patients.

**Keywords:** Type-2 Diabetes, Eccentric Exercise, Concentric Exercise, Glucose, HbA<sub>1c</sub>, Adiponectin

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**\* Corresponding Author: Bahrpeyma F (PhD), E-mail: bahrpeyf@modares.ac.ir**

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