

## **Abstract**

*Introduction:* Physical activity should be part of our everyday life. However, for people with Type 1 Diabetes Mellitus it is the most common cause of hypoglycemia. To control diabetes in the right way, it is therefore necessary to follow certain rules and recommendations that help preventing hypoglycemia while the physical activity remains beneficial at the same time.

*Aim of the work:* The main aim of this study is to clarify the influence of physical activity in connection to long-term control of Type 1 Diabetes Mellitus.

*Methods:* 102 respondents with diagnosed Type 1 Diabetes Mellitus in the age of 19–69 years participated in a quantitative analysis. This research was conducted in a form of multicentric examination at two independent medical centers. The data collection was done through questionnaires focused on physical activity and daily regime. The data from questionnaires were then compared to the values of glycated hemoglobin (HbA<sub>1c</sub>), HDL cholesterol and the total daily dose of insulin of certain patients. For statistical evaluation, analytical tools of Microsoft Office program were used (F-test and t-test).

*Results:* We found correlation between HbA<sub>1c</sub> values in patients physically active for less than 2 hours/week compared to those who are physically active for more than 2 hours/week (62,72 mmol/mol vs. 56,12 mmol/mol,  $p=0,0116$ ). Also, another significant difference was seen with the HDL cholesterol values while comparing people who do some physical activity more than 2 times a week to those who do physical activities at most 2 times a week (1,85 mmol/l vs. 1,61 mmol/l,  $p=0,0119$ ). No statistical significance was found in comparison of HbA<sub>1c</sub> in groups of physically active and non-active, while the non-active group was defined on the basis of our questionnaire in which they said they do not do any kind of physical activity (62,2 mmol/mol vs. 58,1 mmol/mol,  $p=0,1509$ ), in groups of physically active more/less than 2 times a week (58,87 mmol/mol vs. 60,84 mmol/mol,  $p=0,5231$ ) and in groups measuring blood sugar more/less often than 2 times a day (61,8 mmol/mol vs. 58,07 mmol/mol,  $p=0,2227$ ). Furthermore, there was no statistically significant difference when comparing the long-term aspects of doing some physical activity: people doing sports for less than 1 year compared to those who do sports for more than 1 year (61,2 mmol/mol vs. 56,29 mmol/mol,  $p=0,1033$ ). Slightly above the stated  $p$

value, there was the comparison of the total daily dose of insulin between the active and non-active ones (48 IU vs. 41,8 IU,  $p=0,0659$ ).

*Conclusion:* Conducted examination suggested positive influence of the total time of doing physical activities on the compensation of diabetes and positive influence of the frequency of doing physical activities on the concentration of HDL cholesterol in the sample group of people. Other compared parameters showed no statistical significance. Further examination of higher number of respondents could possibly clarify the influence of the frequency of measurements on the control and also the influence of doing physical activities on the total daily dose of insulin.

**Key words:** Type 1 Diabetes Mellitus, physical activity, sport, diabetes control, glycated hemoglobin, HbA<sub>1C</sub>, glycemia