

Summary

Introduction: Movement is one of the basic biological needs of human beings. Physical exercise is a determinant for normal functioning of the organism, and for maintaining physical and mental health over one's lifetime. Nowadays we can observe trends towards reduced physical activity in adult populations as well as among children and adolescents. The problem is particularly pronounced among individuals with chronic diseases, such as diabetes.

Purpose: 1. Assessment of physical activity in children and adolescents with type 1 diabetes, relative to the applied method of insulinotherapy, i.e. use of insulin pen versus insulin pump; 2. Comparison of physical activity level in children and adolescents with type 1 diabetes and in healthy controls; 3. Assessment of relationship between physical activity level presented by children and adolescents with type 1 diabetes and the achieved control of the condition expressed by the value of HbA_{1c}.

Material and Method: Physical activity was assessed in a group of 330 school-age children, i.e. between 6 and 18 years of age. The study group consisted of 215 children with type 1 diabetes (65.2%), and their scores were compared to those acquired by 115 peers with no diagnosed health problems (34.8%). The level of physical activity was assessed with hip-worn accelerometer used by the subjects 12 hours per day, for an uninterrupted period of 7 days. Performed three times, measurements of anthropometric values, i.e. body mass and height were carried out with electronic medical scales. The identified physical activity indexes were supplemented with findings acquired using a survey based on Paediatric Care Report, as well as quality of life questionnaires i.e. the general module PedsQL (Pediatric Quality of Life), version 4.0, as well as 3.2 diabetes module. The achieved control of the condition was expressed with the mean value of HbA_{1c}, determined in the year preceding the study.

Results: Analysis of physical activity measures, relative to the applied insulinotherapy, showed a significant difference in one parameter connected with sedentary time. Higher median values were observed in the mean duration of sedentary breaks (SB) which amounted to 228 minutes = 3.8 h in the group using insulin pens, compared to 176.45 minutes = 2.94 h in the group of those using insulin pump ($p = 0.043$). The value of MVPA during the entire course of the study in the two groups amounted to 362.17 minutes vs. 337.42 minutes; the mean daily MVPA was 54.56 vs. 50.90 minutes; the recommended norm was met by 40.4% vs. 36.8% of the subjects. Significantly higher median values in most of the physical activity measures, i.e. Moderate, Vigorous, total MVPA, mean MVPA/ day, and the total number of steps, were found in the control group ($p < 0.001$), which shows tendency for greater physical activity among healthy children. No significant relationship was observed between physical activity and HbA_{1c}.

Conclusions: 1. Level of physical activity in children and adolescents with type 1 diabetes does not depend on the applied method of insulinotherapy. 2. Children and adolescents with type 1 diabetes present lower level of physical activity compared to healthy peers. 3. Level of physical activity presented by children and adolescents with type 1 diabetes is not related to the achieved control of the condition expressed by the value of HbA_{1c}.

Key words: physical activity, diabetes type 1, children and adolescents