

## Summary

**Introduction:** 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<sub>1c</sub>.

**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, and their scores were compared to those acquired by 115 healthy peers. The level of physical activity was assessed with hip-worn accelerometer used by the subjects for period of 7 days. Performed three times, measurements of body mass and height were carried out with electronic medical scales. The identified physical activity indexes were supplemented with findings acquired using a survey (Paediatric Care Report, quality of life questionnaires i.e. PedsQL 4.0, 3.2 diabetes module). The achieved control of the condition was expressed with the mean value of HbA<sub>1c</sub>, 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) in the group using insulin pens ( $p = 0.043$ ). The recommended value of moderate to vigorous physical activity (MVPA) was met by 40.4% vs. 36.8% of the children with type 1 diabetes. Significantly higher median values in most of the physical activity measures 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<sub>1c</sub>.

**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<sub>1c</sub>.

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