

SUMMARY

The influence of physical activity and selected perinatal risk factors on the prevalence of overweight and obesity in children

Introduction: Obesity in children is a significant worldwide problem related to public health. Regular physical activity is one of the main recommendations aimed at preventing or reducing incidence of obesity in children.

Purpose: 1). Identifying the incidence of overweight and obesity in the study group. 2). Analysis of the relationship between physical activity and the problem of excessive weight in the children. 3). Analysis of the relationship between selected perinatal risk factors and the problem of overweight and obesity in the children.

Material and methods: The study involved 1,300 children from selected kindergartens, as well as primary and middle schools in the Podkarpackie Region. After written consent was received from parents, 1196 children were qualified to participate. 74 subjects presented insufficient duration of recordings on weekdays, 86 subjects presented insufficient duration of recordings on weekends (Saturday-Sunday), and 34 subjects did not achieve sufficient number of weekdays and weekends. Ultimately, the analyses took into account 1,002 children (527 boys and 475 girls).

All the subjects were examined on empty stomach and subsequent measurements were performed in the morning. Each child was examined for body mass and height, as well as body composition. Assessment of the children's physical activity was performed for 7 days. Additionally, the parents provided information about the child and the family by filling in a questionnaire; they also submitted copies of the children's medical history and of the related maternity notes.

Body height was measured with Seca 213 stadiometer. Body mass and body composition were assessed with the analyzer Tanita BC 420 MA. Physical activity was assessed with Actigraph's wGT3X-BT activity monitor.

The study was approved by the Bioethics Commission of the University of Rzeszów, no. 18/12/2015, dated 2 December 2015.

Results: It was shown that 9.4% of the children were overweight and 6.5% were obese. Majority of the children, both girls and boys, presented with normal body mass (72.4% vs.

75.1%). The results showed that 9.7% of the girls and 10.8% of the boys were overweight; obesity was found in 7.6% and 5.5% of the girls and the boys, respectively. Conversely, 10.3% of the girls and 8.6% of the boys in the study group were underweight.

The overweight and obese children spend significantly more time in a sitting position ($p=0.037^*$) and less time performing intensive physical activity ($p=0.037^*$). The risk of excessive weight was greater in children spending <60min. per day performing moderate or vigorous activity than in the children involved in physical activity for >60min. daily.

Comparison of birth weight and length distribution in children with normal BMI and excessive BMI showed statistically significant differences only in birth lengths of 12-15 years old children ($p=0.048^*$) and in the group of boys aged 12-15 ($p=0.003^{**}$).

It was shown that both children born with body mass appropriate for the gestational age, and those born with low body mass are more at risk of obesity and overweight if the daily duration of their involvement in moderate to vigorous physical activity (MVPA) does not exceed the recommended 60 minutes, compared to the children who are active for more than 60 minutes per day. In fact the risk is greater among the children with low birth weight.

Greater increase in maternal body mass during pregnancy is a predictor for the newborn's higher body mass ($p=0.031^*$ for the entire study group and $p=0.024^*$ for the girls).

Conclusions: 1) Sex and place of residence do not differentiate the incidence of overweight and obesity in the study group. 2) Excessive weight was correlated with the subjects' age. 3) Sex and age are differentiating factors for physical activity level. 4) Only half of the subjects dedicate the minimum of 60 minutes daily to MVPA, as recommended, and less than 30% of them meet the norm for average daily steps. 5) Physical activity level corresponds with incidence of excessive weight. Overweight and obese children dedicated less daily time to MVPA, and were found with lower count of daily steps and lower number of CPM. 6) In the group of girls aged 12-15 involved in activity for <60 min. per day, excessive weight was twice as common as in the girls meeting the recommendations. 7) Birth body weight is positively related to BMI centile, yet no significant differences were identified in its values between the children with excessive weight and those with normal body mass. 8) Birth length is linked with lower BMI centile only in the boys aged 12-15. 9) Increase in maternal body mass during pregnancy predicts development of excessive weight in the child.