

PRESCHOOL CHILDREN – OBESITY AND RISK BEHAVIOURS. TRENDS FROM 2009 TO 2013

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ABSTRACT

In the beginning of 2011, according to WHO more than 40 million children under 5 years are overweight, and over 30 million of them live in developing countries. In Bulgaria Iotova et. al. (2009) reported an increased incidence of obesity in 9-year old girls from 4.3% to 10.4% over a period of 5 years (2002-2007).

AIM: To determine the incidence of overweight and general and abdominal obesity in preschool children, and also some risk behaviors and their trend over 2009.

PARTICIPANTS AND METHODS: height, weight and WC were measured of a total of 117 children aged $4,53 \pm 0.29$ years that were attending kindergartens in Varna. BMI (kg/m^2) was calculated and compared with the IOTF references for the corresponding age and sex. The comparison was made with a group of 189 children from Varna, of the same age (mean age $4,58 \pm 0,31$ years), measured by the same methods in 2009.

RESULTS: When comparing the two groups there was a significant reduction in WC ($p=0.022$). In 2009 OW/obese were 12.7% of the children and significantly increased to 19.7% in 2013 ($p=0.01$). There is a decrease in the proportion of obese children (from 4.2% to 0.9%) and an increase in those who were overweight (from 8.5% to 18.8%).

CONCLUSION: Reducing the percentage of obese children in this young age most likely reflects a positive trend in the attitude towards obesity. Increasing percentage of overweight children who are potential pool of increasing obesity with age, requires serious attention in the prevention of obesity.

Key words: *obesity, preschool children, risk behaviours*

At the beginning of 2011, according to WHO more than 40 million children under 5 years are overweight (OW), and over 30 million of them live in the developing countries (11). In the developed countries overweight and obesity among children of the same age increased from 7.9% in 1990 to 11.7% in 2010 and is expected to reach 14.1% in 2020 (3). In

Bulgaria Iotova et. al. (2009) reported an increased incidence of obesity in 9-year old girls from 4.3% to 10.4% over a period of 5 years (2002-2007) and in boys respectively from 9.2% to 10.6 % (5). In another study of ours from 2009, we found a significant trend in the proportion of girls with OW/obesity in the direction from 4 to 6 years of age, with more than 8-fold increase in the incidence of obesity among 6 year olds compared to 4 year olds (7).

Obesity as a health problem affecting multiple organs and systems, and resulting in an increased metabolic risk (10) is affected by certain environmental factors. Most common risk factors, also for the preschool age, are the diet, the sedentary lifestyle and the reduced physical activity (2).

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Following up of the trends of obesity and also the underlying behavioural determinants leading to obesity in preschool age, is necessary to plan the further conduct for prevention of this modern epidemic.

The aim of this study was to determine the prevalence of overweight, general and abdominal obesity in preschool children in 2013 and their tendency to 2009. As an additional goal we set to explore their relationship with some obesity-related behavioural determinants and their trend from 2009.

PARTICIPANTS AND METHODS

The survey in 2013 included 117 children aged 4-6 years (mean age 4.53 ± 0.29 , 50.4% boys), recruited from randomly selected kindergartens in Varna. They were compared with a group of 189 children at the same age (4.58 ± 0.31 years, 49.7% boys), who attended kindergartens in Varna and took part in a survey in 2009.

Anthropometric measurements with applying standard procedures and medical instruments (SECA 214, TANITA, SECA 201) were the same as those used in 2009. Height and weight were measured to an accuracy of 1 mm and 0.1 kg respectively, as the children were required to be without shoes and outer wear. Waist circumference (WC) was measured with an accuracy of 1 mm with elastic nonstretchable meter in the middle of the medial axillary line connecting the 10th rib and crista iliaca. Body mass index (BMI) was calculated using the standard formula - body weight (kg)/height² (m²). The presence of OW and obesity was defined using the IOTF references of BMI for children according to sex and age (1).

In order to identify behavioural determinants that are associated with the presence of childhood OW and obesity, the parents who accepted to participate, completed questionnaires providing information on the duration of daily screen time of the child (how much time per day they spend in front of television (TV) and computers), intake of soft drinks, duration of breastfeeding.

The study was approved by the Ethical Committee of the Medical University in Varna. Parents gave written informed consent. Data analysis was performed with the statistical analyzer SPSS for

Windows, ver. 19.0. Differences where $p \leq 0.05$ were accepted as significant.

RESULTS

Overweight/obesity measured in 2009 children was 12.7% and significantly increased in 2013 to 19.7% ($p=0.01$). There was a reduction in the proportion of obese children (from 4.2% to 0.9%, $p<0.001$) and an increase in those who were overweight (from 8.5% to 18.8%, $p<0.001$). When comparing the overweight and obese children from the two groups, there was a significant decrease in WC – from 51.51 ± 5.17 cm to 50.28 ± 3.22 cm, $p=0.022$ (without gender differences).

When comparing the two groups of overweight children (those of 2009 and those of 2013), significant differences were observed in height, weight and waist circumference, with no difference in age and sex (Figure 1 and 2).

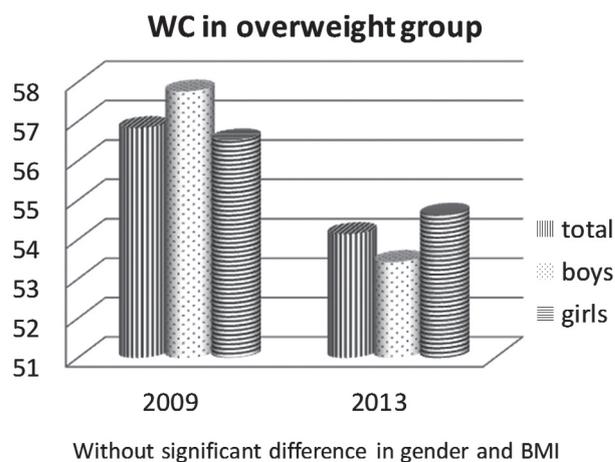


Fig. 1. WC comparison in overweight group

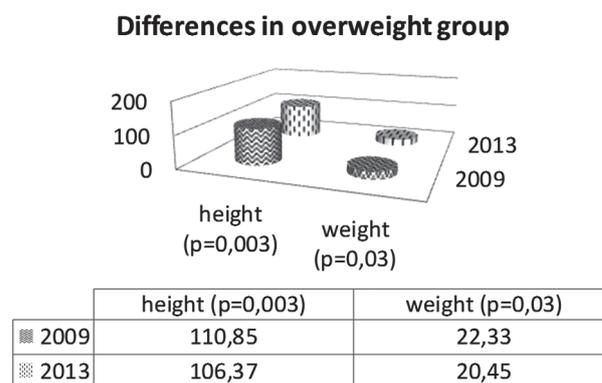


Fig. 2. Height and weight comparison in overweight group

In 2009, 14.8% of the parents considered that their children drank too much soft drinks, while in 2013 only 2.1% of parents reported consumption of soft drinks from 4 to 6 cups per day.

For the period of the investigations, time spent in front of the TV increased 4-fold ($p < 0.001$), while the time spent by the children in front of the computer was increased even more - almost 5 times ($p < 0.001$). Time spent by the preschool children in front of the TV was 1.67 ± 1.17 hours in average per week in 2009, while in 2013 it was 6.79 ± 4.97 h. Children play a computer 0.56 ± 0.64 hours on average in 2009, while that time dramatically increased to 2.14 ± 3.01 hours per week in 2013.

The mean duration of breastfeeding has increased from 4.40 ± 3.89 to 6.9 ± 6.02 months ($p < 0.001$).

DISCUSSION

Our findings for lower relevant share of obese children among the otherwise increasing overweight in urban preschool children rises hope for slowing at least the trend of morbid obesity in Bulgaria. These results may be due to the ongoing interventional programs to improve the nutrition of children in the kindergartens and raising public awareness about the effects and risks of being overweight. Since the two groups of children studied were not large enough to confirm the trends, studies on a larger scale must be conducted.

Waist circumference as a inexpensive, quick, harmless and reliable method that is proved to be a fully acceptable surrogate for measuring abdominal obesity (6). Visceral fat tissue is known to be metabolically more active and its increase poses greater risk compared to total body obesity (9, 10). The decrease that we found in the overweight children presumably reflects lower percentage of abdominal obesity and per se lower metabolic risk in preschool children.

Screen time is a sedentary behavior that many studies connect with increased obesity, both in children and adults (4). There are studies that the effect of TV viewing time on childhood obesity is independent of physical activity status and may be attributed to the increased total energy intake during TV watching (8). The significant increase in the preschoolers screen time is a finding that requires

close surveillance and preventive actions. Taken together with the fact of increased overweight even at this young age, it might present a serious public health risk in the near future.

CONCLUSION

There is a possibility that the findings of the present study - reduction in the prevalence of urban children with obesity at this young age, to reflect a positive trend in the attitude towards obesity. More alarming, though, is the increasing rate of overweight in these very young children that are difficult to be identified by families, society and the family physicians as individuals at risk and who are a potential pool of increasing obesity with age. This fact requires serious attention in the prevention of obesity.

Increased screen time (sedentary behaviour) is identified from the present study as a problem worsening with time. That is why it represents a target behaviour for school and family interventions among urban preschoolers. Programs related to healthy eating, increasing physical activity and reduction of sedentary behaviour in preschool age are conducted both internationally and in our country (School Fruit, Ballabeina (<http://www.children-on-the-move.ch>), ENERGY (<http://www.projectenergy.eu>), ToyBox (<http://www.toybox-study.eu>). At the end of the latter study (with our participation) there will be much more extensive data for this age group, which will allow more focused preventive efforts in the future, including in our country.

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