



Prevention of child obesity as a measure of preventing malignant diseases

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ABSTRACT

Numerous investigations documented that there is a significant correlation between obesity and the onset of malignant neoplasms. It has been known for decades that Vojvodina is an area characterized by frequent occurrence of obesity with adult population, which starts much earlier in childhood. Good knowledge of incidence in child obesity is a first step in the prevention of malignant diseases. The study encompassed the anthropometric measurements (body height and body weight) of 3298 boys and 3146 girls aged from 6 to 15 years, from 10 primary schools of the wider area of the city of Novi Sad. The measurement data served as the basis to calculate the body mass index (BMI). On the basis of BMI the incidence of the overall obesity ($\geq P_{85}$) among the examined boys on the territory of Novi Sad community was found to be 16.59%. Overweight ($P_{85} - P_{95}$) was observed in 10.28%, and obesity ($\geq P_{95}$) in 6.31% boys. The analysis of the nutrition status among the examined schoolgirls on the territory of Novi Sad community, on the basis of BMI, showed that overall obesity ($\geq P_{85}$) was present in 14.69% of schoolgirls; overweight ($P_{85} - P_{95}$) was found in 9.38%, and obesity ($\geq P_{95}$) in 5.31% of the examined schoolgirls. The high percentage of obese schoolchildren cannot be considered as desirable, especially if it is taken into account that there has been a significant increase compared with the previous examination.

KEY WORDS: Obesity; Risk Factors; Neoplasms; Child; Adolescence

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INTRODUCTION

The data stated by WHO that each year about 6.3 million people in the world die as a consequence of malignant neoplasms are really alarming. It is predicted that by the year 2025 this number will increase by 40%. In the majority of cases the causes can be ascribed to the living style, inadequate nutrition, insufficient physical activity, smoking, and adverse environmental factors. It has also been documented that there exists significant correlation between obesity and the onset of malignant neoplasms. With obese women, there is a significantly higher risk of the appearance of endometrial, cervical, ovarian, and postmenopausal breast cancer compared with those of normal body weight, whereas the prostate tumor is more frequent with obese men (1).

It has been known for decades that Vojvodina is an area characterized by frequent occurrence of obesity with adult population. The polling data from 1975, encompassing more than 410,000 adults, showed that 26.7% to 30.2% of them were obese (2). The analysis of obesity incidence from 1989, obtained on the basis of criteria prescribed for the CINDI Programme¹, showed that about 25% of adult inhabitants of Novi Sad were excessively obese ($BMI \geq 30 \text{ kg/m}^2$) and about 40% moderately obese ($BMI = 25-29 \text{ kg/m}^2$) (3).

The obesity incidence with children has acquired pandemic dimensions. The newest data from the world literature show that the prevalence of obesity in childhood and adolescence is in the range from 17% to 31%, and that obesity at this age is more frequent in the countries of poorer economic status, where our country belongs (4).

Results of longitudinal studies concerning the etiological role and effects of obesity in child-

hood on the morbidity and mortality in the adulthood are congruent. The most serious and far-reaching consequence of child obesity is the adult obesity with the presence of co-morbidity and health risks (5-7).

By preventing obesity it is possible to mitigate a lot of mass non-infective diseases, among them the malignant ones. The right time for doing it is the childhood. Good knowledge of the incidence of child obesity is the first step in dealing with the problem.

PATIENTS AND METHODS

In the period 2000-2003 anthropometric measurements encompassed 6444 school-age children (range, 6-15 years), from 10 primary schools of the wider area of the city of Novi Sad; 3298 boys and 3146 girls were included in the study with an approximately uniform age distribution.

We used following methodology measurements:

- Body height (in cm) - measured with anthropometer, without shoes, with the heels put together and the head in the Frankfort horizontal plane (8,9).
- Body weight (in kg) - measured on the medical digital scale in the minimal underwear, according to the prescribed methodology (8,9).

The measurements were performed in accordance with the recommendations: Professional methodological instructions on implementing the regulation on health protection of women, schoolchildren, and students (8) and recommendations of the World Health Organization (9). The measurement data served as the basis to calculate the body mass index (BMI), index of nutrition status of individual. The body mass index presents the ratio of body weight (BW)

and body height (BH). $BMI = BW(kg)/BH^2(m)$, where the BW presents body weight in kilograms, and BH^2 presents body height in square meters. The assessment of the nutrition status of children was done on the basis of the NHANES I criteria (10). The calculated values were compared with the tabulated percentile values P_{85} , P_{95} , to obtain the data of the nutrition status, where the percentile values P_{85} means overweight, and percentile values P_{95} means obesity.

RESULTS

We found that overall incidence of obesity on the basis of BMI among the examined schoolboys in Novi Sad community was 16.59%. Overweight ($P_{85} - P_{95}$) was observed in 10.28% and obesity ($\geq P_{95}$) in 6.31% of examined boys (Figure 1).

The analysis of nutrition status data among examined schoolgirls in Novi Sad community on the basis of BMI showed overall obesity ($\geq P_{85}$) was present in 14.69% of schoolgirls. Overweight ($P_{85} - P_{95}$) was found in 9.38% and obesity ($\geq P_{95}$) in 5.31% of the examined schoolgirls (Figure 1).

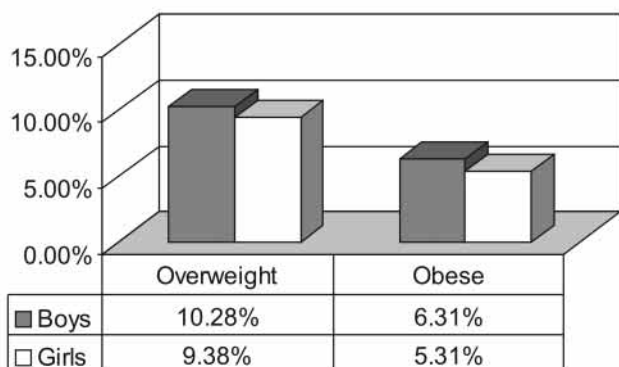


Figure 1. Incidence of obesity ($BMI \geq P_{85}$) with schoolchildren

An alarming increase of the incidence of obesity was observed in examined groups of boys and girls (6.31% and 5.31%, respectively) compared with the results obtained in the same area in 1998/1999 (Figure 2).

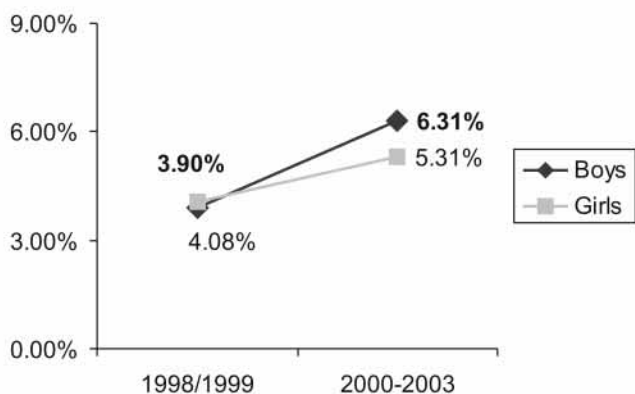


Figure 2. Incidence of obesity ($BMI \geq P_{95}$) with schoolchildren

DISCUSSION

Our results about the incidence of obesity among the schoolchildren based on $BMI (\geq P_{85})$ showed that the overall rate was 15.69% (16.59% in boys and 14.69% in girls). If compared with the majority of literature data for the developed world, especially the USA, obesity in our environment is less frequent (12-14). This result could be expected in view of the fact that obesity among children in the developed world is most frequent in the USA. Taking into account the previously reported data for Serbia (JUSAD Study), the children from Vojvodina, and thus from the city area of Novi Sad too, are more prone to obesity (15).

Our investigation of the nutrition status of primary schoolchildren in the community of Novi Sad from 1998/1999 (11) showed that overweight was present in 14.8% and obesity in 3.90% of schoolboys. In the sample of schoolgirls the rate of overweight was 10.25% and the rate of obesity was 4.08%. The high percentage of obese schoolchildren found in presented study cannot be considered as desirable, especially if it is taken into account that there has been a significant increase compared with the previous examination (11).

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¹ CINDI Programme of World Health Organization (Countrywide Integrated Noncommunicable Diseases Intervention Programme)