OBESITY IN ADOLESCENT- PREVALENCE AND RELATIONSHIP WITH CARDIOVASCULAR RISK FACTORS

Luiza Despina Demian [1], ***Mihaela Simona Popoviciu*** [1], ***A-R. Popa*** [1], ***Diana Aron*** [1], ***Prună Camelia*** [1], ***Zourob Emadeldeen*** [2]

[1] University of Oradea, Faculty of Medicine and Pharmacy, Emergency Clinical County Hospital, Department of Diabetes and Internal Diseases
[2] Neasher Hospital, Israel

Abstract

If obesity in adults is largely evaluated, the same issue in child and adolescents is only at the beginning. Overweight and obesity tend to be highly prevalent in childhood and adolescents. Overweight and obesity are closely related with cardiovascular risk factors: hypertension, family history or with an unhealthy lifestyle characterized by physical inactivity or smoking. Children and adolescents who are overweight or obese needs a special attention from the family and the physician in order to increase their physical activity and modify their habits and lifestyle. Overweight and obesity are highly prevalent in adolescents; our results are comparative with those from the literature. Because the relationship between obesity and cardiovascular risk factors is significant and strong, overweight in obese adolescent needs a special attention from the physician.

keywords*: obesity, cardiovascular risk factors.*

Introduction

The incidence of adolescent obesity is increasing dramatically and it is always associated with hypertension, adverse lipid profiles and in last period of time with type II diabetes. Unless reversed, this trend predicts an epidemic of adult cardiovascular disease. Rates of obesity among American children and adolescents have increased 2-to 4-fold over the past two decades; more than 25% of American children are considered clinical obese, with weight that is 20% above ideal body weight [1, 2]. Analyses based on the adult definition of obesity indicate that 11,2% of 12-through 19-year-olds had a body mass index of 30 or higher [3]. This is important because overweight in childhood has been linked with increased rates of hypertension, hyperlipidaemia, type 2 diabetes and early atherosclerotic lesions in adults. Several studies have supported the relation between adolescent obesity and cardiovascular disease. There are many reports that suggest the strongest association between morbidity and mortality from cardiovascular disease in overweight adults who were overweight as adolescents. Although the specifics of the transition from risk factors in childhood to adult diabetes and cardio-vascular diseases are unclear, there are many evidences that lifestyle modification and weight control in childhood and adolescence may reduce risk of type 2 diabetes and cardio-vascular diseases in adulthood [4]. Adolescence is a transitional phase during which adult patterns of health are established, it is also a pivotal time to intervene.

Information about the prevalence of overweight and obesity in adolescents in our country are incomplete or quite missing.

The aim of this study was to evaluate the prevalence of the overweight and obesity in adolescents from a high school in Oradea and to establish, if there is, the relationship between this metabolic disease and cardiovascular risk factors (family history, smoking, physical inactivity and arterial hypertension).

Method

We included in our screening 721 adolescents 390 (54,1%) girls and 331(45,9%) boys aged 15 to 19 years. For all of them we measured higth, weight, blood pressure and they were invited to answer the questions included in a questionnaire about lifestyle: smoking, nutrition, physical activity and family history. This questionnaire was identically with that used in 2003 in Young Risk behaviour Surveillance. For all subjects we measured: high, weight, blood pressure and cholesterol level.

Obesity was defined according to body mass index based on growth charts for age and sex released by the CDC in May 2000 [5]. The 85th percentile identifies those who are overweight and the 95th percentile those who are obese [6].

Results

Overweight and obesity's prevalence was 8% and 4,9% (Figure 1).

The overweight prevalence was the same for boys and girls, but the obesity prevalence was higher in boys than girls (7,4% versus 4,1%) (Table 1.)

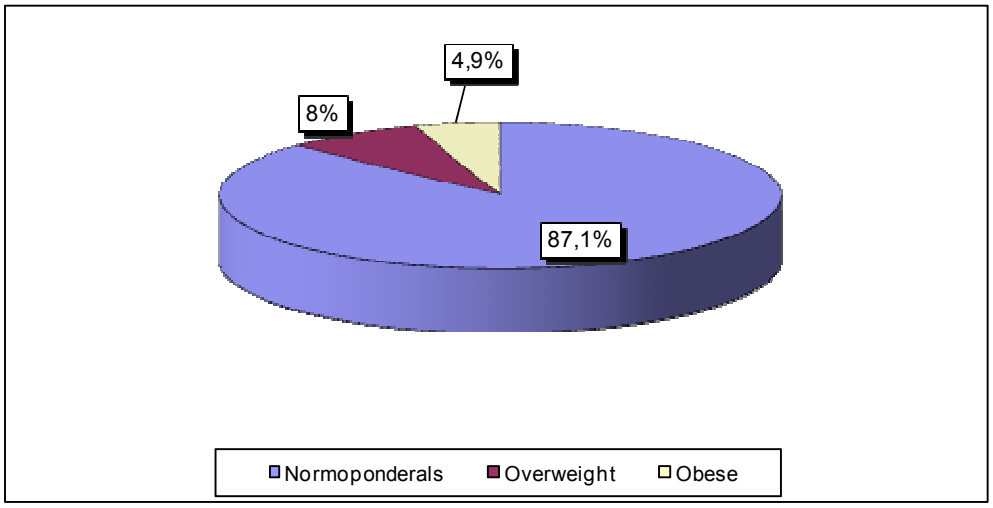

Figure 1. Prevalence of overweight and obesity

Overweight had almost the same prevalence in girls and boys (9% vs 9,5%), regarding obesity this was highly prevalent in boys 7,4% and only 4,1% in girls. Obesity has an ascendent trend by aging, but only in boys (from 12,5% to 19,2%).

Table 1. Prevalence of overweight and obesity related with gender

	Normo-ponderals		Overweight		Obese	
	Nr.	**%**	**Nr.**	**%**	**Nr.**	**%**
Girls	345	88,5	31	9,0	14	4,1
Boys	283	85,5	27	9,5	21	7,4

As the subjects are aging, obesity's prevalence is increasing, but only for boys. In girls there is a descendent trend in obesity's prevalence probably because they are, at this age, preoccupied about their look. (Table 2).

Table 2. Prevalence of overweight and obesity related with gender and age

Age	Girls	Boys
15 years	8,9	12,5
16 years	14,2	15,9
17 years	15,1	17,1
18 years	10,1	19,2

About the relationship with other cardiovascular risk factors obesity and overweight was highly prevalent in sedentary adolescents and in those whose parents were obese. Obese adolescents were more frequent with high value of blood pressure (51,6% vs 19,7% in normoponderals). Obese girls were smoking in a great proportion when they were compared with those with normal weight (80,6% comparative with 49,7%). In boys the proportion was: 50,3% of boys with normal weight were smoking comparative with only 19,4% from the obese boys who were smoking.

Overweight and obesity are more frequent in subjects with obese parents-when parents were normoponderals obesity's prevalence was 4,6% and when both parents were obese the prevalence was 41,0%.

Smoking is a frequent behaviour among adolescents. Obese girls are smoking heavily (80,6%) than those who are normoponderals (49,7%). Among boys the situation is quite reversal – 50,3% of normoponderals are smoking and only 19,4% of the obese.

Table 3. Smoking behaviour in normoponderals, overweight and obese adolescents

	Girls	**Boys**
	Normoponderals	
Smokers	49,7	50,3
Nonsmokers	57,2	42,8
	Overweight and obese	
Smokers	80,6	19,4
Nonsmokers	28,1	71,9

Hypertension's prevalence is 2,6 fold higher in overweight and obese adolescents than in normoponderals. Also the obese are more sedentary than normoponderals.

Discussions

Our results regarding to overweight and obesity are comparable with those founded in Canada or France [7, 8]. In these screenings boys are more frequently obese than girls.

Excessive body fat evolves from a complex interactions of physiologic, metabolic, behaviour and social factors. Often obese children have obese parents, an association that is thought to be at least

partially genetic; our results are also in this way.

Lack of physical activity is a significant contributor to obesity. Nearly half of american Youth aged 12-21 years fail to be vigorously active on a regular basis and about 14% of young people report no recent physical activity. Our results reveal that obese adolescents are physical inactive and obesity's prevalence is increasing by the time spending on television. Watching television is a significant contributor to inactivity [9].

Obesity and hypertension are significantly associated. Data from eight large U.S epidemiological studies involving over 47000 children show that irrespective of race, sex, or age blood pressure was elevated in those with high values of body mass index [10]. Sorof reported a three times greater prevalence of hypertension in obese compared to nonobese adolescents.

Conclusions

Overweight and obesity tend to be highly prevalent in childhood and adolescents.

Overweight and obesity are closely related with cardiovascular risk factors hypertension, family history or with an unhealthy lifestyle characterized by physical inactivity or smoking.

Children and adolescents who are overweight or obese needs a special attention from the family and the physician in order to increase their physical activity and modify their habits and lifestyle.

REFERENCES

1. Sotern MS, Hunter S, Suskind R Brown R. Udall J. Motivating the obese child to move: the role of structured exercise in pediatric weight management. *Southern Medical Journal* 1999; 579-584.

2. Centres for Disease Control and Prevention (CDC) 2001 *Behavioural Risk Factor Surveillance System Survey* Data.Atlanta, GA: U.S.Department of Health and Human Services, Centres for Disease Control and Prevention.

3. Ogeden CL, Flegal KM, Caroll MD. Prevalence and trends in overweight among US children and adolescents. *Journal of the American Medical Association* 2002; 288: 1728-1732.

4. Steinberger J, Daniels SR. Obesity, insulin resistance, diabetes, and cardiovascular risk in children. An American Heart Association Scientific Statement from the Atherosclerosis,Hypertension, and Obesity in the Young Committee and the Diabetes Committee. *Ciculation* 2002; 107: 1448-1453.

5. Kuczmarski RJ, Ogden CL. 2000 CDC Growth charts for the United States: Methods and Development. National Center for Health Statistics *Vital Health Statistics* 2002; 11 (246): 23-26.

6. Wiliams CL, Hayman LL, Daniels SR Robinson TN et al. Cardiovascular health in childhood: A Statement for Health Professionals from the Committee on Atherosclerosis, Hypertension, and Obesity in the Young (AHOY) of the Council on Cardiovascular Disease in the Young, American Health Asociation *Circulation 106,* 143-160.

7. Chauhan T. Factors contributing to obesity in adolescents *CMAJ*-february, 17, 2004; 170 (4).

8. Gielen S, Hambrecht R. The Childhod obesity epidemic *Circulation* 2004; 109: 1911-1913.

9. Proctor HM, Moore LL Gao D et al. Television viewing and change in body fat from preschool to early adolescence: The Framingham Children's Study. *International Journal of Obesity* 2003; 27: 827-833.

10. Rosner B, Prineas R, Daniels SR. Blood pressure differences between blacks and whites in

relation to body size among US children and adolescents *American Journal of Epidemiology* 2000; 151: 1007-1019.

11. Sorof J, Franco K, Bernard L Portman RJ. Isolated systolic hypertension, obesity, and hyperkinetic hemodinamic states in children. *Journal of Pediatrics* 2000; 140: 660-666.

Correspondence Data:
LUIZA DEMIAN
e-mail: demianluiza@yahoo.com
telefon: 0723780612
fax: 0359463544