

Prevalence of Overweight and Obesity among the Affluent Adolescent School Children of Amritsar, Punjab

Sharda Sidhu, Gauri Marwah and Prabhjot

Department of Human Genetics, Guru Nanak Dev University, Amritsar, India

ABSTRACT

In the present study, an attempt has been made to assess the prevalence of overweight and obesity in adolescent children (between 10–15 years of age) of the affluent families of Amritsar district of Punjab, a state in rapid economic and epidemiological transition. A total of 640 children (323 boys and 317 girls) were measured for height and weight. Overweight and obesity were assessed using age and sex-specific body mass index (BMI) cut-off points. 9.91% boys and 11.99% girls were overweight, and 4.95% boys and 6.31% girls were obese. The prevalence of overweight and obesity among the affluent children in Amritsar was as high or higher as in some industrialized countries.

Key words: obesity, overweight, body mass index, school children, Punjab

Introduction

The prevalence of overweight and obesity in adults and children is increasing in high-income countries¹, and is also rapidly emerging as significant health problem in less-developed countries^{2–4}. In USA⁵, the prevalence of overweight among 5–24 years old individuals increased two folds between 1973 and 1994. A similar trend has been observed in Japan⁶, where the frequency of obese children aged 6–14 years increased from 5% to 10% during the last 20 years. The increase in the prevalence of childhood obesity is also seen in developing countries. In Thailand⁷, the obesity in 6–12 years old children increased from 12.2% to 15.6% in two years period while a similar prevalence (15.8%) was observed in the children of Saudi Arabia⁸. Only limited data are available on prevalence of obesity from the Indian subcontinents. Subramanyam et al.⁹ reported no statistically significant change in prevalence rate of obesity in 17 years span among Chennai girls of India. A study conducted in 2002 amongst 870 school children of Delhi¹⁰ reported the prevalence of obesity among boys and girls as 8% and 6%, respectively. There is an urgent need to know the burden of this problem in Punjab, because Punjab is an economically advanced and physically robust state of the country. The children in Punjab have greater risk of overweight and obesity, as the Punjabi society has achieved a socio-economic status

similar to that of the developed societies, especially with respect to living conditions and nutritional intake. Therefore, in the present study, an attempt has been made to report the prevalence of overweight and obesity among the school children of Amritsar district of Punjab.

Material and Methods

This study was a cross-sectional study conducted in one Public School and one Convent School catering to the affluent population of Amritsar district of Punjab. The data have been collected from 323 boys and 317 girls ranging in age from 10 to 15 years. The exact date of birth was collected from each subject with great care either from the concerned school registers or from the birth records. Height and weight measurements were taken on each subject using a standard protocol¹¹. Overweight and obesity were denoted by body mass index (BMI). Two percentile cut-offs¹² were used to estimate the overweight and obesity. The subjects with a BMI = 85th percentile for age and sex were considered as overweight, and the subjects with BMI = 95th percentile for age and sex represented obesity. The whole data were arranged into six age groups, each of one-year duration starting from 10.00 to 10.99 years till 15.00–15.99 years.

Results

It is apparent from Table 1 that the percentage prevalence of overweight and obesity according to BMI percentile criteria in affluent boys was found to be 9.91% and 4.95% whereas in girls the percentage prevalence was 11.99% and 6.31%, respectively. In boys, the overweight prevalence varied from 5.0% to 14.58% with two peaks at 11.0 and 13.0 years of age whereas in girls the prevalence range has been from 6.00% to 15.62% with three peaks at 11, 12 and 13 years. The obesity in boys ranged from 3.33% to 6.45% and in girls the range of obesity has been from 4.00 to 9.37%. Overall, a greater

proportion of overweight and obese girls and boys were present in the 11–13 years of age.

Discussion

In children aged 10–15 years in Punjab, a state in rapid epidemiological transition, the prevalence of overweight and obesity was 10.94% and 5.62%, respectively (Table 1). These proportions are similar to or higher than those reported in some industrialized countries than in the past few decades¹³. The overall prevalence of overweight and obesity was higher among girls than

TABLE 1
NUMBER AND PERCENTAGE PREVALENCE OF OVERWEIGHT AND OBESITY ACCORDING TO AGE AMONG BOYS AND GIRLS OF AMRITSAR

Age group (years)	Total no. of subjects	No. of normal subjects	% of normal subjects	No. of over-weight subjects	% of overweight subjects	No. of obese subjects	% of obese subjects
BOYS							
10	50	44	88.00	4	8.00	2	4.00
11	62	50	80.64	8	12.90	4	6.45
12	58	48	82.75	7	12.06	3	5.17
13	48	38	79.16	7	14.58	3	6.25
14	45	40	88.88	3	6.66	2	4.44
15	60	55	91.66	3	5.00	2	3.33
Total	323	275	85.14	32	9.91	16	4.95
GIRLS							
10	53	44	84.90	6	11.32	3	5.61
11	47	37	78.72	7	14.89	3	6.38
12	64	49	76.56	10	15.62	6	9.37
13	57	45	78.94	8	14.03	4	7.01
14	46	40	86.95	4	8.69	2	4.34
15	50	45	90.00	3	6.00	2	4.00
Total	317	259	81.70	38	11.99	20	6.31
G. Total	640	534	83.44	70	10.94	36	5.62

TABLE 2
INCIDENCE OF OVERWEIGHT AND OBESITY IN SOME POPULATIONS OF THE WORLD

Country	Boys		Girls	
	Overweight	Obesity	Overweight	Obesity
Seychelles ¹⁶	9.20	3.10	15.90	4.50
Brazil ¹³	4.70	0.10	15.20	2.00
UK ¹³	9.60	0.90	11.70	1.20
Hong Kong ¹³	11.70	3.10	9.80	1.80
The Neitherlands ¹³	5.50	0.30	6.50	0.30
Singapore ¹³	10.50	1.70	7.00	1.00
USA ¹³	18.10	3.30	16.50	4.00
India				
Delhi ¹⁰	–	–	8.00	6.00
Chennai ⁹	9.62	5.94	9.67	6.23
Punjabi (Present study)	9.91	4.95	11.99	6.31

boys, but this difference was statistically non significant ($\chi^2=1.36$, $p=0.507$) in total sample and among all other age groups. Maximum prevalence of overweight and obesity (Table 1) was found during the period between 11–13 years. This increase may be associated with the increase in adipose tissue and overall weight gain during the pubertal growth spurt.

The comparative picture of the prevalence of overweight and obesity in various populations (Table 2) no doubt suffer from the limitations of periodic dissimilarity of field work methodology, but there is higher prevalence of overweight and obesity in Punjabi children as compared to those of UK, Netherlands and Brazil¹³ in the 1980's and 1990's. The prevalence rate was almost similar to the prevalence observed in Hong Kong and Singapore but less than US population¹³. However, it is likely that the prevalence of obesity has increased in

these countries between the time it was measured and 2001 when it was measured in Punjabi children. As indicated in the available studies^{14,15}, in most of the high-income population, the overweight and obesity track from childhood to adulthood. If obesity tracks in low and intermediate countries^{16,17} also, then the Punjabi population may experience in the next decade a high prevalence of adulthood obesity similar to the developed countries. The prevention and control of this problem must, therefore, claim prior attention. Therefore, appropriate precautionary measures to prevent further progression of the problem into an epidemic must be taken right at this stage, because if the present trends of overweight/obesity continue, the situation can get worse even within decade and overweight could emerge as the single most important public health problem in adults.

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S. Sidhu

Department of Human Genetics, Guru Nanak Dev University, Amritsar 143 005, India
e-mail: shardasidhu@hotmail.com

ZASTUPLJENOST PREKOMJERNE TJELESNE TEŽINE I PRETILOST MEĐU ADOLESCENTIMA IZ AMRITSARA, PUNJAB

SAŽETAK

U ovom radu je prikazan pokušaj procjene zastupljenosti prekomjerne tjelesne težine i pretilosti među adolescentima (10–15 godina starosti) iz Amritsara, Punjab, pokrajine koja pokazuje brzu ekonomsku i epidemiološku tranziciju. Ukupno je pregledana visina i težina 640 djece (323 dječaka i 317 djevojčica). Prekomjerna tjelesna težina i pretilost su procjenjivane korištenjem dobno-specifičnog body mass indexa, s vrijednošću praga. Prekomjernu tjelesnu težinu našli smo kod 9,9% dječaka i 11,98% djevojčica, a pretilost kod 4,95% dječaka i 6,30% djevojčica. Zastupljenost prekomjerne tjelesne težine i pretilosti među adolescentima je visoka ili viša od nekih industrijaliziranih zemalja.