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Study of Childhood Obesity among School Going Children [6-18 Years] In Rajasthan

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Abstract

Background: To study the prevalence of obesity and overweight among school children in Rajasthan

Methods- This study was conducted in Department of Pediatrics in collaboration with department of Radiology, Mahatma Gandhi Medical College and Hospital of Mahatma Gandhi University of Medical Sciences and Technology, RIICO Industrial Area, Sitapura, Jaipur (Rajasthan) from January 2018 to June 2019.

Results: The prevalence of overweight and obesity in urban school were 6.3% and 3.9% respectively whereas prevalence of overweight and obesity in rural school were 3.1% and 1.6% respectively.

Conclusions-Childhood obesity is a problem in Puducherry and requires timely intervention for its control.

Keywords: Childhood obesity, overweight, school children

Introduction

Childhood obesity has become a huge problem acquiring proportion of an emerging pandemic. Once considered a problem of developed world childhood obesity, since past few years is fast becoming a problem of developing nations including India[2]

The nutrition transition is associated with a change in dietary habits, decreasing physical activity and rising prevalence of obesity.[2] Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Obesity in children and adolescents is gradually becoming a major public health problem in many developing countries, including India.[3] 'One-half of obese school children become obese adults. However, whether or not obesity persists into adulthood, obesity in childhood appears to increase the risk of subsequent morbidity'.[4] Significance of estimating prevalence of childhood obesity thus cannot be overemphasized.

There are a few studies, reporting, prevalence of childhood and adolescent obesity and overweight from different parts of India that range from 3% to 29%, and also indicate that the prevalence is higher in urban than in rural areas.[5] However, there is limited published data on a representative sample from Rajasthan on prevalence of childhood obesity. With recent rise in number of diabetics (5.04%)[6] and hypertensives in the Rajasthan, it was necessary to have the accurate data on prevalence of childhood obesity and therefore an attempt was made to assess the prevalence of overweight and obesity among school children aged between 6 and 18 yrs.

Material and Methods

This study was conducted in Department of Pediatrics in collaboration with department of Radiology, Mahatma Gandhi Medical College and Hospital of Mahatma Gandhi University of Medical Sciences and Technology, RIICO Industrial Area, Sitapura, Jaipur (Rajasthan) from January 2018 to June 2019.

Study Design: This was School based cross-sectional study

Study Period: The study was conducted from January 2018 –June 2019

Study Population: School based cross-sectional study conducted in urban and rural school children 6-18 year's age group in Jaipur.

Inclusion criteria

- Boys and girls in the age group of 6-18 years
- Consent of school authorities/ parents.

Exclusion Criteria

- All children having chronic illness like liver disorder, hypertension, diabetes etc.
- Children less than 6 years of age

Patients for whom the parent/guardian didn't give informed consent

Methodology

The study was questionnaire based. A detailed proforma of demographic profile, dietary habits, physical activity, duration of TV watching, socioeconomic status of family and family history of diabetes, hypertension and obesity were recorded. The study was approved by the hospital's Institutional Review Board and consent was obtained by the school management, parents and the students prior to study. All the anthropometric measurements were taken in school premises.

The anthropometric measurements of 6-18 years old children were recorded using standardized procedures. Body weight was recorded in kilograms using a standard digital weighing machine and height was measured by using a portable stadiometer with sensitivity of 0.5 centimeters. Body mass index (BMI) was derived by dividing the subject's weight by the square of his or her height, typically expressed in metric units. Their BMI was calculated and plotted over BMI CDC growth chart and was analyzed.

BMI = Weight (in kilogram)/ height (in meters)^2.

We applied the cutoff points standardized by the centers for disease control and prevention (CDC) growth chart in identifying the age and gender specific cutoff points for the BMI with the age ranging from 2 years to 20 years for the labeling of overweight and obesity among the included subjects.

S.No.	Body condition	Percentile
1.	Underweight	< 5
2.	Healthy weight	≥ 5 &<85
3.	Overweight	≥ 85 &<95
4.	Obesity	≥95

Student with BMI > 85th percentile were enrolled in our study for further investigation to found out prevalence of NAFLD in overweight and obese children. Children with BMI above 95thpercentile were considered as obese, those above85th percentile and below the 95th percentile as overweight.

Statistical Methods

All the calculated data were tabulated and statically analyzed using SPSS (version 17.1) software. Interpretation made by using Mean, Median, Standard Deviation and Proportion. Appropriate tests of significance were applied to all results.

Results

Table 1: Overall prevalence of overweight and obesity as per CDC chart

Sex	Body condition according to BMI								Total	
	underweight		Healthy		Overweight		Obese			
	No	%	No	%	No	%	No	%	No	%
Female	109	31.96	207	60.70	16	4.70	9	2.64	341	39.70
Male	219	42.28	254	49.03	28	5.40	17	3.28	518	60.30
Total	328	38.18	461	53.67	44	5.12	26	3.03	859	
$\chi 2$	11.43									
P	.0096									

Out of 859 children, 44 children were found overweight among these 28 were male and 16 were female. Twenty six children were found obese among these 17 were male and 9 were female. The overall prevalence of overweight and obesity were 5.12 and 3.03 per cent, respectively. The overall prevalence of overweight and obesity was 8.15% (70/859). On applying chi-square test the difference was found statistically significant.

Out of 539 children of urban school, 34 children were found overweight among these 23 were male and 11 were female. Twenty one children were found obese among these 13 were male and 8 were female. The prevalence of overweight and obesity in urban area were 6.3 and 3.9 per cent, respectively. On applying chi-square test the difference was found statistically significant

A total 320 school children from rural area were screened for overweight and obesity. Out of 320 children of rural school, 10 children were found overweight among these 5 were male and 5 were female. Five children were found obese among these 4 were male and 1 was female. The prevalence of overweight and obesity in rural area were 3.1 and 1.6 per cent respectively.

Table 2: Distribution of overweight and obese children in rural and urban school according to BMI

BMI range	Urban area			Rural area		
	No.	Mean	SD	No	Mean	SD
<23 Kg/m^2	15	20.76	1.38	9	20.57	1.66
23 to 25 Kg/m^2	12	24	0	1	23.74	0.38
>25 Kg/m^2	28	27	1.64	5	27.78	2.83
Total	55	24.91		15	23.09	
$\chi 2$	5.91					
P	0.052					

In our study total 70 candidates were found overweight and obese among them 55 candidates were from urban school and 15 were from rural school. In urban school 15 candidates had BMI less than 23 Kg/m^2, 12 candidates had BMI between 23 to 25 Kg/m^2, and 28 candidates had BMI more than 25 Kg/m^2, whereas in rural school 9 candidates had BMI less than 23 Kg/m^2, 1 candidate had BMI between 23 to 25 Kg/m^2, and 5 candidates had BMI more than 25 Kg/m^2. The average BMI of urban school children for overweight and obese was 25 Kg/m^2, whereas in rural school, average BMI for overweight and obese children was 23.1 Kg/m^2

Discussion

Obesity in adolescents and children has risen to alarming levels globally and this has serious public health consequences because obesity is associated with a number of metabolic comorbidities. These include type 2 diabetes mellitus, dyslipidemia, hypertension, fatty liver disease, coronary artery disease, sleep apnea, osteoarthritis, polycystic ovary syndrome and even cancer.

Unfortunately, identifying cut-off point of BMI for overweight and obesity in children is difficult as they have less disease related to obesity than adults. Asian adult populations are more prone to adiposity and central obesity at a lower BMI than their western counter parts. In our study, we have used centers for disease and prevention (CDC) growth chart, BMI for age percentiles, for boy and girls 2 to 20 years for the labeling of underweight, healthy, overweight and obesity. Children with ≥85 percentile were considered overweight, those with ≥ 95 percentile were obese while those between ≥ 5 &<85 percentile were considered healthy or normal and < 5 percentile were categorized as underweight.

Our study was planned to assess the occurrence of obesity among children aged 6-18 years of urban and rural School. This was a school based cross-section studies in which a total of 859 children were taken from urban (539) and rural (320) school. Overall out of 859 candidates, 518 (60.3%) were male and 341 (39.7%) were female. A total 70 children were found overweight and obese, among them 55 (78.6%) from urban area and 15 (21.4%) from rural area. Out of 70 overweight and obese 45 (64.3%) were male and 25 (35.7%) were female. Out of 859 children, 44 children were found overweight among these 28 were male and 16 were female. Twenty six children were found obese among these 17 were male and 9 were female. The overall prevalence of overweight and obesity was 8.15% (70/859). The prevalence of overweight and obesity were 5.12 and 3.03 per cent, respectively. On

applying chi-square test the difference was found statistically significant.

This was similar to observation made by Singh *et al.*[7] (2018) they reported the prevalence of overweight and obesity was 5.5% and 4.5% respectively in government school and 11.37% and 9.75% in private school children in Jaipur. Subramanyam *et al.*[8](2014) they reported the prevalence of overweight and obesity was 9.6%and 6.0% respectively. Manju Lata and Ajay[9] (2017) reported prevalence of overweight and obesity was 10.45% and 4.09% respectively in Jaipur. Another study by Jain et al.[10](2016) in Jaipur showed the prevalence of overweight and obesity was 12.5% and 5.6% respectively. Krishanan *et al.*[11] (2017) conducted study in 5-16 year age group from semi urban areas of Coimbatore city, Tamil Nadu. The prevalence of overweight and obesity is 12.8% and 5.8%, respectively.

Conclusion

Childhood obesity is a problem in Rajasthan and requires timely intervention for its control.

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