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Original Research Paper

Increasing Trend of Obesity in the Adolescents from Rural Wardha

Medical Science

Obesity, Metabolic syndrome, Cardio metabolic risk factors

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ABSTRACT

Aim: To study the prevalence of Obesity among the adolescent in rural population of PHC, Anji. Dist. Wardha, Maharashtra, INDIA

Methods:
A cross sectional study was carried out among the adolescents (10-19 years) of Anji P.H.C. Sample size studied was 405, selected by random sampling. The sampling frame available with department of Community Medicine. We collected the data on their socio-demographic variables.
Results: Out of 405 individuals studied 182(44.9%) were male and 223(55.1%) were female. In study population, 5.4 % of subjects were found to overweight group (85th- <95th percentile), 59.3% had normal BMI (<85th percentile) and 35.3% were thin group (<5th percentile). Only 2.2% of the subjects were found to have waist circumference more than the cut off (> 90th percentile).
Conclusion: These finding indicate that the prevalence of obesity is definitely alarming situation in rural communities. The early identification of cardio metabolic risk factors can help to prevent or delay metabolic syndrome, diabetes and cardiovascular disease.

Introduction:
Obesity is a serious public health problem in many countries. It is an independent risk factor for cardiovascular diseases and significantly increases the risk of morbidity and mortality.1 The prevalence and trends of obesity among US children and adolescents have continued to increase among all age groups; the increase has been more significant among African Americans and Hispanic individuals.2

It has long been observed that about 40% of overweight children will continue to have increased weight during adolescence and 75–80% of obese adolescents will become obese adults. A child with a high BMI has a high risk of being overweight or obese at 35 years of life and this risk increases with age. The consequences of this disease starting in childhood may be more severe as the duration of obesity will be longer. It may therefore have a greater deleterious impact on health and the rate of morbidity and mortality, than obesity starting in adulthood .3

Obesity results in several alterations that have been linked as co–morbidities of the disease. Hyperinsulinemia is prevalent in obesity and is strongly linked with cardiovascular disease, type 2 diabetes mellitus, hyperlipidemia, and hypertension.4

Obesity may indicate a tendency to gain weight easily and a need for changes in diet and/or exercise. Generally, a child is not considered obese until the weight is at least 10 percent higher than what is recommended for the height and body type. Obesity most commonly begins in childhood between the ages of 5, 6 and during adolescence. Studies had shown that a child who is obese between the ages of 10 and 13 has an 80 percent chance of becoming an obese adult.

The causes of obesity are complex and include genetic, biological, behavioral and cultural factors. Basically, obesity occurs when a person eats more calories than the body burns up. If one parent is obese, there is a 50 percent chance that the children will also be obese.

However, when both parents are obese, the children have an 80 percent chance of being obese. Although certain medical disorders can cause obesity, less than 1 percent of all obesity is caused by physical problems. Abdominal obesity and insulin resistance are key component of cluster (metabolic syndrome), this is because large number of studies have shown that visceral adipose tissues is strongly associated with development of metabolic syndrome. 5

Material & Methods
A cross sectional study was carried out in rural area of Primary Health Centre. All adolescent in the age group of 10-19 years of Primary Health Centre Anji, were included in study. The subjects who were not willing to participate in the study were excluded. The subjects were selected by using simple random sampling. The sampling frame available with department of Community Medicine was used for drawing the sample

The study was commenced after obtaining clearance from the Institutional Human Ethical Committee. The subjects were selected after obtaining written informed consent from them. Detailed history was taken including past and present status of health of parent, occupation, education, dietary intake and addiction of subjects etc. Using predesigned proforma anthropometric measurement, were noted in the pretested proforma.

The subjects underwent anthropometric measurement, in where height and weight were measure by measuring tape and weight machine to the nearest 0.1cm and 0.1kg respectively. Waist circumference was measure by measuring tape in horizontal plane at the midpoint between the bottom of the rib cage and above the top of the iliac crest with person breathing silently and BMI was calculated by dividing

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weight(kg) by height squared (m2).

The criteria are as follows for BMI and Waist circumference:
Health Statistics 2000 Centre for disease Control & Prevention (CDC-NCHS), Classification of BMI is as follows.6

Undernourished	BMI	<5th percentile
Normal	BMI	5 to <85th percetile
Overweight	BMI	85 to 95th percetile
Obesity	BMI	>95thpercentile

We used NCEP Pediatric Panel report for Waist circumference

Waist circumference at or above the 90th percentile value for age and sex from sample population classified as having abdominal obesity (while in adult value is >102 cm in men and 88cm in women).

Statistical Analysis was conducted by using EPI-INFO & Health Watch Pro version 3.1 software. Chi square test was applied to test the significance of difference between two group and p value < 0.05 considered as significant.

Results
BMI in study population:
In study population, 5.4 % of subjects were found to overweight group (85th- <95th percentile), 59.3% had normal BMI (<85th percentile) and 35.3% were thin group (<5th percentile). None of the participants was obese.

Table : 1 BMI distribution in study population.

BMI (percentile)	Number of subjects	Percentage
Overweight	22	5.4
Normal	240	59.3
Thin	143	35.3
Total	405	100

[85th- <95th percentile- Overweight]

Waist circumference in study population:
In study population, only 2.2% of the subjects were found to have waist circumference more than the cut off (> 90th percentile). According to NCEP Pediatric Panel report criteria 2.2% of the participants was obese.7

Table 2: Distribution of waist circumference.

Waist circumference(percentile)	Number of subjects	Percentage
≥90th	9	2.2
<90th	396	97.8
Total	405	100

[Waist circumference > 90th percentile is considered as obesity]

Table 3: Association of Family history of obesity with Metabolic Syndrome
In study population, we found high prevalence of metabolic syndrome[18.6%] in family history of obesity against the 8.8% in no family history of obesity.

Family history of obesity	Examined (%) 405(100)	Metabolic syndrome 40(9.9%)	p-value
Yes	43	8(18.6)	
No	362	32(8.8)	<0.05*

[p<0.05 is consider as significant]

Table 4: Comparison of obesity/overweight with sociodemographic variables
In the present study, the prevalence of overweight found to be significantly higher in subject with family history of obesity and hypertension (p<0.05). Also the prevalence of obesity was found to be differ significantly in subjects with family history of obesity and diabetes (p<0.05).

Risk Factor	Family history of obesity	Family history of Hypertension	Family history of Diabetes
Obesity	<0.05	----------	<0.05
Overweight	<0.05	<0.05	----------

[p<0.05 is consider as significant]

Discussion:
In present study, we found overall prevalence of metabolic syndrome was 9.9%. We found metabolic syndrome was significantly associated with family history of obesity (p<0.05). The prevalence of metabolic syndrome was significantly higher being 18.6 % among those with family history of obesity as against 8.8% among those without family history of obesity (p<0.05).

Obesity & Overweight:
In the present study, we found only prevalence of obesity was 2.2% by waist percentile and that of overweight was 5.4% by body mass index. Our finding was comparable to finding of a study carried out by Bharti et al. 8 They reported 4.3% prevalence of overweight and obesity among school going children of Wardha city.

Similarly, James et al also showed that the prevalence of overweight was 17% and of obesity was 3% in 9 to 15 year of age group subjects.9 A recent report from Karachi, showed 6% was obese and 8% overweight in school going childrens.10 However, study conducted in Pune, Maharashtra, found that nearly 19.9% were overweight, whereas 5.7% were obese .11

In the present study, the prevalence of overweight found to be significantly higher in subject with family history of obesity and hypertension (p<0.05). Also the prevalence of obesity was found to be differ significantly in subjects with family history of obesity and diabetes (p<0.05). Similarly, Nasreddine L et al showed the positive association of obesity with family history of obesity and higher economic group. 12

Conclusion
Therefore, from this study, we conclude that prevalence of obesity is a major health problem not only in urban area but also in rural communities. There is need of early identification of cardio metabolic risk factors. This can help to delay occurrence of metabolic syndrome, diabetes and cardiovascular disease.

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