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Prevalence of metabolic syndrome in overweight and obese adolescents

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Introduction

- There is an epidemic of childhood obesity in India and worldwide
- Indians are known to be more prone for development of metabolic syndrome at a lower BMI and younger age due to their genotype and phenotype
- Although there are many reports on childhood obesity, there is paucity of data on childhood metabolic syndrome
- The prevalence of metabolic syndrome may be higher than expected in overweight and obese children
- The aim of this study was to determine the prevalence of metabolic syndrome in school going overweight and obese adolescents

Methods

- Study design: Cross sectional
- Participants: School going children (age 9-18 years) after taking consent/ascent of 3 schools from Rishikesh, India.
- Anthropometric measurements (weight, height and waist circumference) and blood pressure were taken by standard methods.
- BMI for age ≥85th and<95thpercentile will be classified as overweight BMI for age ≥95th percentile will be classified as obese
- Fasting venous blood sample was taken for insulin, blood sugar, triglyceride, LDL and HDL cholesterol
- MS was defined as per International Diabetic Federation (IDF) criteria
- Insulin resistance was calculated by HOMA-IR.

Table 1: IDF criteria for diagnosis of Metabolic syndrome		
Parameters	Age 10 to <16 years	Age > 16 years (same as adult)
Obesity (WC)	≥90 th percentile or adult cut-off if lower	Central obesity (defined as with ethnicity specific values)
Triglyceride	≥1.7 mmol/L (≥150 mg/dL)	≥1.7 mmol/L(≥150 mg/dL)
HDL-C	<1.03 mmol/L(<40 mg/dL)	<1.03mmol/L (<40 mg/dL) in males <1.29mmol/L (<50 mg/dL) in female
Blood pressure	Systolic ≥130/ diastolic ≥85 mm Hg	Systolic ≥130/ diastolic ≥85 mm Hg
Glucose (mmol/L) or known T2DM	≥5.6 mmol/L (100 mg/dL) (If ≥5.6mmol/L [or known T2DM] recommend an OGTT	≥5.6 mmol/L (100 mg/dL) (If ≥5.6 mmol/L [or known T2DM] recommend an OGTT

Table 2: Anthropometric and biochemical characteristics of school children

Variable	Total (n=100)	Male (n=55)	Female (n=45)	p value
FBS (mg/dl)	94.8(6.4)	95.9(6.3)	93.3(6.4)	0.04*
HDLc (mg/dl)	37.3(8.1)	36.5(6.7)	38.5(9.5)	0.22
TG (mg/dl)	112.2(52.4)	118(55.9)	101.5(46.2)	0.09
Insulin	13.3(6.0)	12.0(5.1)	13.9(6.9)	0.14
HOMA-IR	2.9(1.6)	2.7(1.4)	3(1.8)	0.33
SBP (mmHg)	122.1(12.3)	124.8(11.3)	118.8(12.9)	0.01*
DBP (mmHg)	69.5(11.4)	68.2(12.6)	70.9(9.6)	0.32

Result

- A total of 100 school going children were analyzed for this study
- The mean age of study population was 13.84 (2.23) years
- Male to female ratio was 1.2:1
- According to IDF criteria prevalence of metabolic syndrome was 29% (95% CI 21% to 38%)
- There was statistically significant higher prevalence of MS in male as compared to female (p<0.05)
- Mean fasting blood sugar, HDL cholesterol, triglyceride, insulin, HOMA-IR, systolic and diastolic blood pressure are shown in **Table 2**

Conclusion

We found significantly high prevalence of metabolic syndrome in adolescents, thus indicating the possibility of early complications in adulthood.

References:

1. Zimmet P, Alberti KGMM, Kaufman F, Tajima N, Silink M, Arslanian S, Wong G, Bennett P, Shaw J, Caprio S, IDF Consensus Group: The metabolic syndrome in children and adolescents – an IDF consensus report. *Pediatr Diabetes* 2007; 8:299–306.

2. Tandon N, Garg MK, Singh Y, Marwaha RK. Prevalence of metabolic syndrome amongurban Indian adolescents and its relation with insulin resistance (HOMA-IR). *J Pediatr Endocrinol Metab.* 2013;26:1123-30

3.Guijarro de Armas MA, Monereo Megías S, Merino Viveros M, Iglesias Bolaños P, Vega Piñero B. Prevalence of metabolic syndrome in a population of obese children and adolescents. *Endocrinol Nutr.* 2012; 59:155-9.