

# CLINICO-BIOCHEMICAL CORRELATION BETWEEN CHILDREN WITH OBESITY AND METABOLIC SYNDROME



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NO CONFLICT OF INTEREST. NO FUNDING.

## INTRODUCTION

- Childhood obesity is associated with risk of developing metabolic syndrome (MetS)
- Paucity in Indian literature regarding correlation between clinical and biochemical parameters in obese and MetS.

## OBJECTIVES

- **Primary:** Comparing clinical and biochemical parameters of obese children, controls and MetS.
- **Secondary:** Correlation between clinical and biochemical parameters in Non MetS and MetS obese children

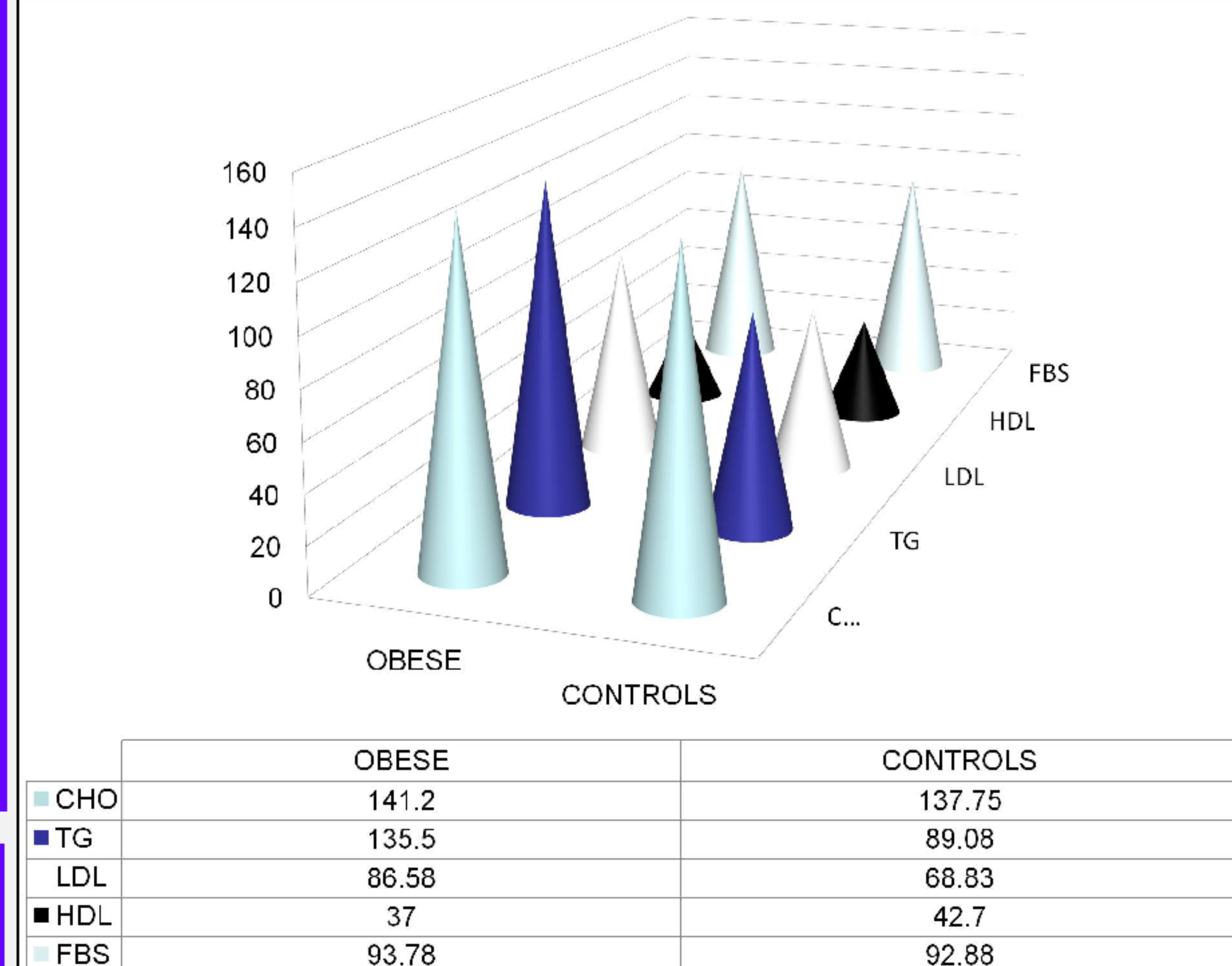
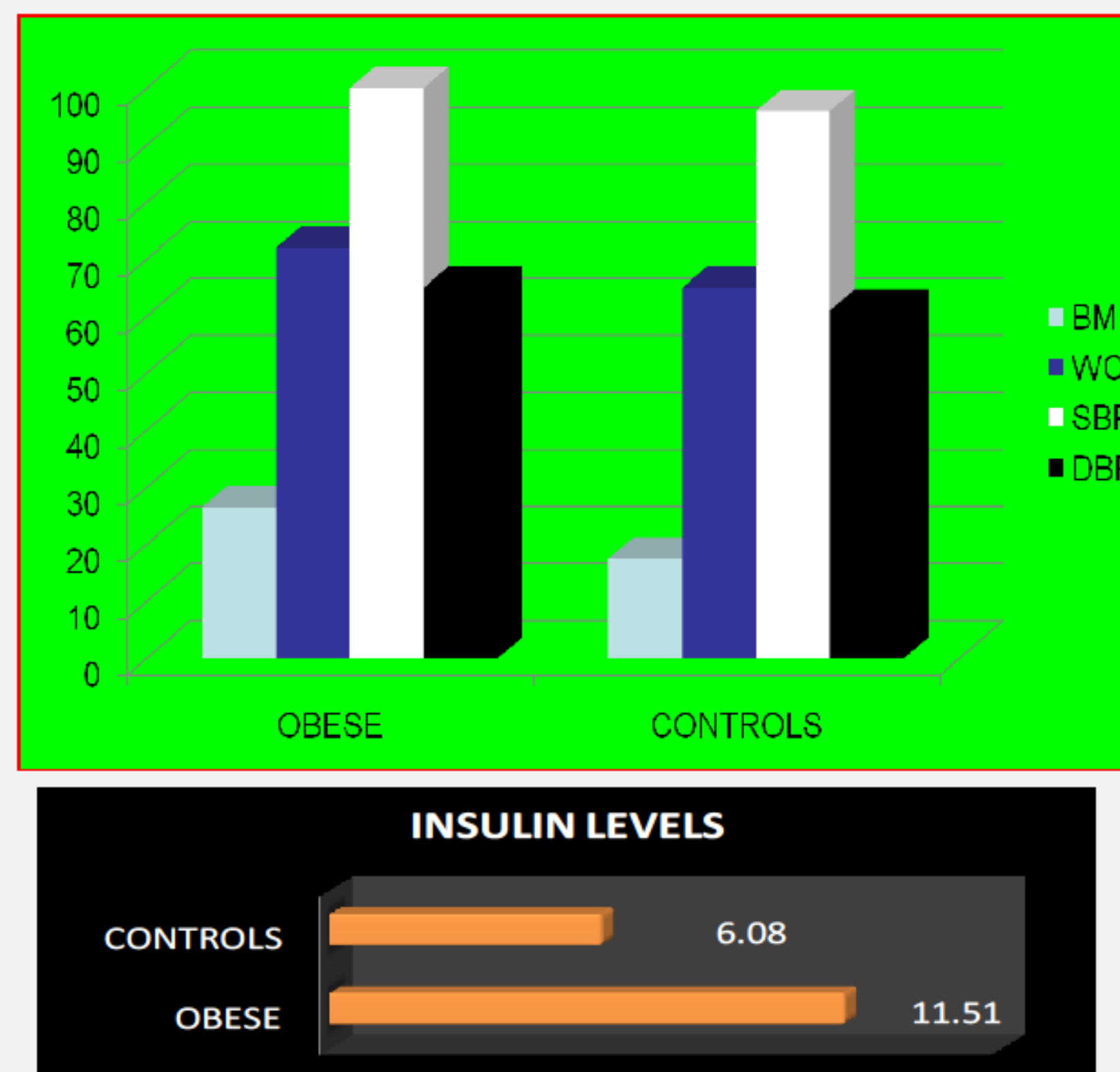
## METHODS

- Eighty children (40 obese and 40 age and sex matched controls) 5–18 years.
- Approval by Institutional Ethics Committee.
- Informed consent/assent taken.
- Obesity was defined as BMI greater than 95<sup>th</sup> centile.
- Waist circumference measured at the midpoint of the lowest rib cage and the iliac crest, to the nearest 0.1 cm, in a standing position during end-tidal expiration.
- WC greater than 70<sup>th</sup> centile of the reference percentiles in Indian children was taken as definition for abdominal obesity.
- Blood Pressure measured twice using mercury sphygmomanometer (Elkometer-300, India) in sitting position (right arm) with appropriate sized cuffs and average taken and on three separate occasions for any evidence of hypertension and interpreted as per age, height and gender specific charts.
- Sexual Maturity Rating was done according to Tanner staging.
- Lipid profile measured using auto analyser and Insulin levels by electrochemiluminescence and Fasting blood sugar by glucose oxidase method.

## RESULTS

Mean age of study population = 11.15±2.52 years.  
Prepubertal : Postpubertal = 19 : 21 children.

- **CLINICAL PROFILE:** BMI and WC significantly higher in obese ( $p < 0.001$ ) while Systolic and Diastolic BP were comparable.
- **BIOCHEMICAL PROFILE:** TG and LDL were significantly higher and HDL significantly lower in obese ( $p < 0.001$ ) while CHO and FBS were comparable. Serum insulin levels were significantly higher in obese ( $p < 0.001$ )



- **4 prepubertal and 14 pubertal** obese had MetS
- **Clinical Profile:** BMI & WC significantly raised in MetS ( $p < 0.01$ )
- **Biochemical Profile:** Significant dyslipidemia with raised FBS & Insulin in MetS

	Non MetS	MetS	p value
CHO	26.58±1.88	29.45±3.08	<0.01
TG	135.5±40.9	165.6±44.6	<0.01
LDL	79.21±22.4	95±26.1	<0.01
HDL	39.43±1.95	36.89±2.18	0.45
FBS	93.78±7.08	97.02±2.2	<0.01
Insulin	15.96±2.34	8.47±3.64	<0.01

BMI and WC had significant positive correlation with LDL and insulin levels ( $p < 0.05$ ) in obese children

## CONCLUSIONS

- Obese children have high BMI, increased WC and higher prevalence of dyslipidaemia (67.5%) putting them at greater risk of MetS.
- High BMI and increased WC correlated strongly with increased LDL ( $r=0.48$ ,  $r=0.52$ ) and high insulin levels ( $r=0.52$ ,  $r=0.73$ ) in obese children.
- With onset of puberty, WC and BMI increases significantly and there is increased prevalence of dyslipidaemia.
- Children with MetS had significantly higher BMI and WC ( $p < 0.01$ ) with all lipid parameters, FBS and Insulin levels significantly higher ( $p < 0.01$ ) than non MetS obese.

Biochemical parameters	Age	BMI	WC	SBP	DBP
TG	0.07 (0.65)	-0.01 (0.94)	-0.015 (0.93)	-0.108 (0.51)	-0.141 (0.39)
CHO	-0.07 (0.67)	0.02 (0.91)	-0.10 (0.58)	-0.10 (0.58)	-0.03 (0.86)
HDL	0.11 (0.51)	0.14 (0.40)	0.12 (0.48)	-0.03 (0.83)	-0.05 (0.75)
LDL	0.43 (0.005)	0.48 (0.008)	0.36 (0.02)	-0.09 (0.60)	0.12 (0.47)
FBS	0.18 (0.27)	0.114 (0.40)	0.27 (0.10)	0.10 (0.53)	0.24 (0.14)
Insulin	0.870 (<0.001)	0.52 (0.001)	0.73 (<0.001)	0.27 (0.09)	0.23 (0.18)

## REFERENCES

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3. Cook S et al *Arch Pediatr Adolesc Med* 2003
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