HOW EARLY IS INSULIN RESISTANCE IN OUR PEDIATRIC POPULATION WITH METABOLIC SYNDROME

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NO CONFLICT OF INTEREST. NO FUNDING.

INTRODUCTION

- Childhood is the critical period for development of obesity & complications.
- With obesity on rise worldwide, its complications, metabolic syndrome & insulin resistance on the rise too.
- There is paucity in Indian literature regarding the onset and prevalence of insulin resistance in children with metabolic syndrome.

METHODS

- ❑ Approved by Institutional Ethics Committee
- ❑ Fifty 5-18 years overweight and obese children (≥85th percentile of WHO growth charts)
- ❑ Informed assent/consent taken.
- ❑ Cross sectional observational study
- ❑ Data collected -

✓Anthropometric(weight,height,Body mass index, waist circumference),
✓Clinical (Blood Pressure),
✓ Biochemical (fasting blood glucose, lipid profile) data

- **Insulin resistance** – HOMA (homeostasis model assessment index) >3.5

HOMA –IR = fasting glucose(mg/dl)* fasting insulin(mU/L) / 405

- **Metabolic syndrome** (International Diabetes Federation guidelines)

✓Central obesity (defined as waist circumference ≥ 90th percentile of the ethnicity-specific values) AND any two of the following:
✓Raised triglycerides: ≥ 150 mg/dL (1.7 mmol/L)
✓Reduced HDL: ≤ 40mg/dL (1.03 mmol/L)
✓Hypertension or previously diagnosed hypertension(SBP ≥ 130mmHg, DBP ≥ 85mmHg)
✓Elevated FPG ≥ 100mg/dl

- ❑ Reciever Operator Curve analysis – HOMA value best predicting metabolic syndrome

OBJECTIVES

- **Primary:** To evaluate insulin resistance in children with metabolic syndrome
- **Secondary:** To compare children with and without metabolic syndrome.

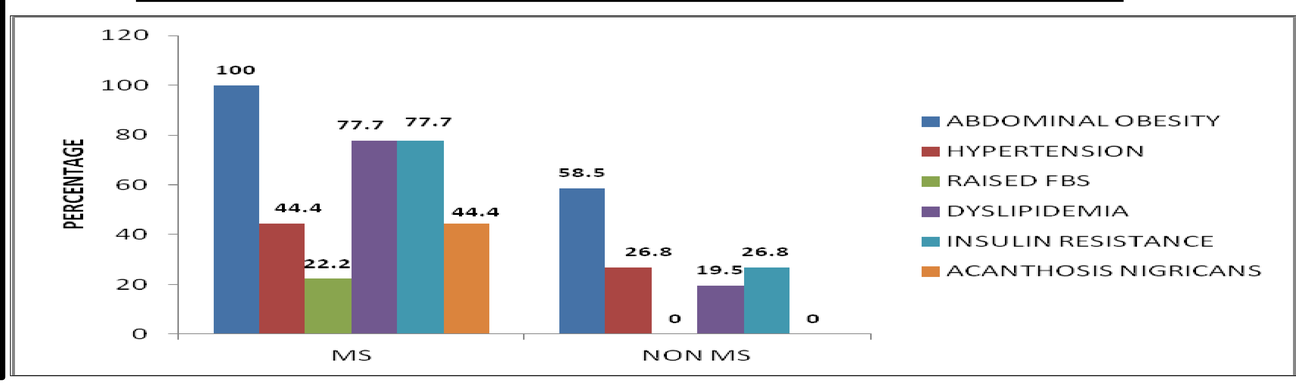
RESULTS

❖Prevalence of Metabolic syndrome – 18%(9/50)
❖Mean age :11.46±1.59 years
❖Puberty – higher MS (71.4%)
❖Screen time – higher in metabolic syndrome children (3.6±0.8 hours vs 2.6±1.2 hours p=0.02).

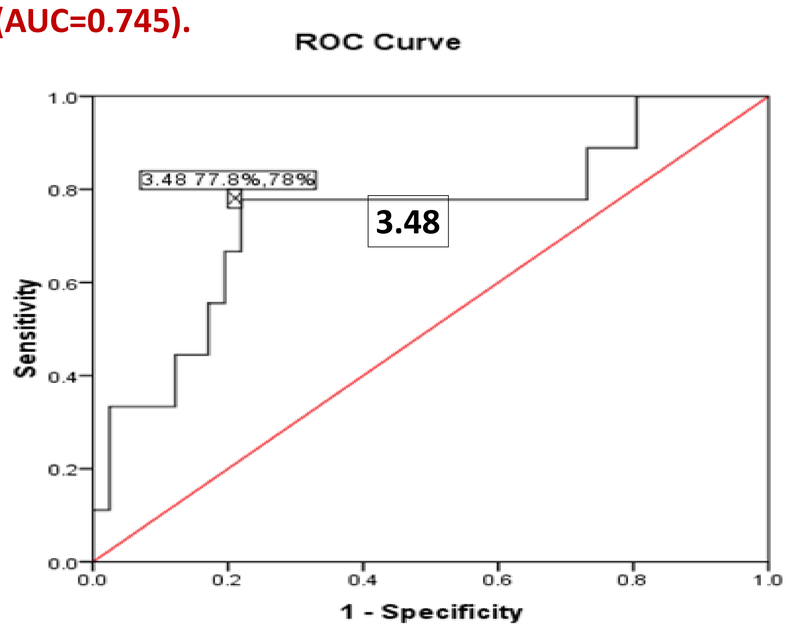
Comparison of children with and without metabolic syndrome

Parameter	MS	Non- MS	p value
Waist circumference(cms)	80.8±5.3	70.7±8.77	0.00
SBP (mmHg)	118±7.2	111.5±9.5	0.06
FPG (mg/dl)	88.1±9.4	81.6±6.1	0.01
PPPG (mg/dl)	125.4±12.7	109.4±9.2	0.00
Fasting insulin(µU/ml)	19.2±5.6	15.2±4.4	0.02
HOMA-IR	4.17±1.35	3.10±1.07	0.01
Triglycerides (mg/dl)	164.6±29.8	117.4±19.2	0.00

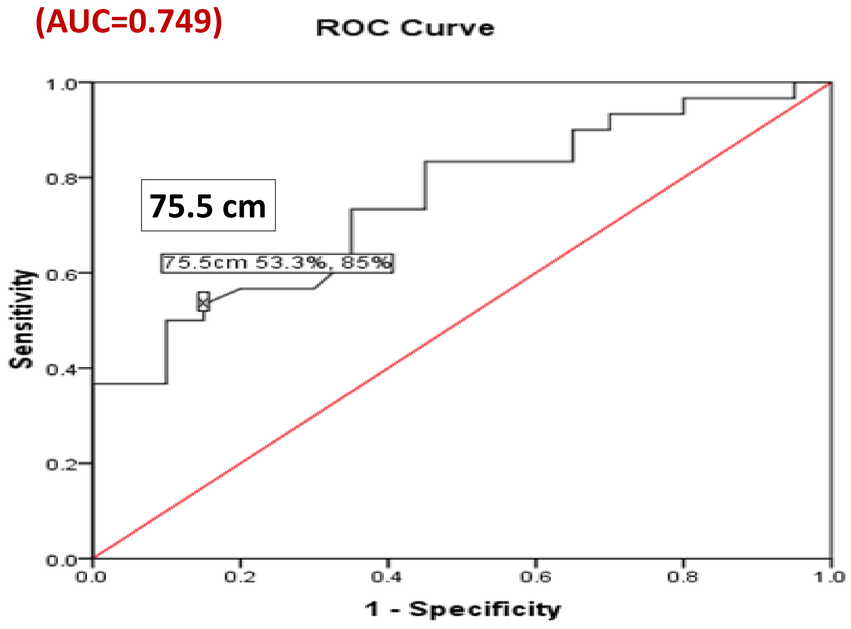
Comorbities in children with and without Metabolic syndrome



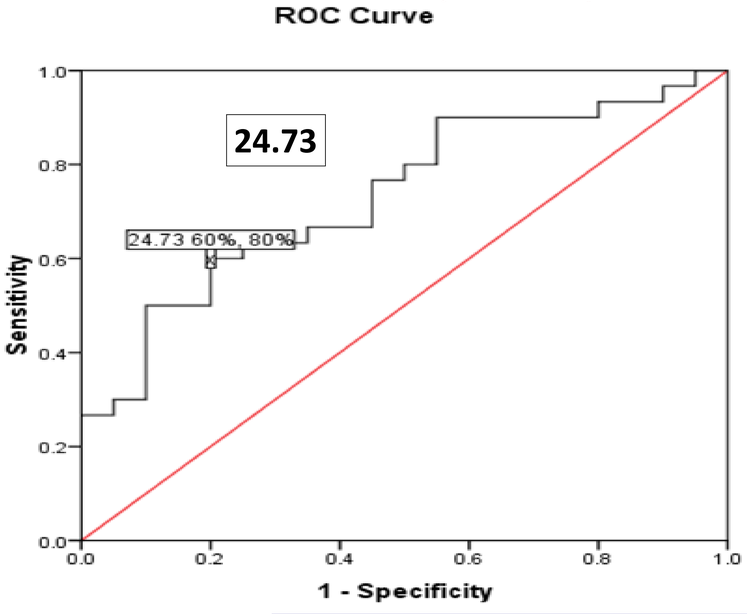
ROC of HOMA with metabolic syndrome. (AUC=0.745).



ROC of waist circumference with metabolic abnormalities (AUC=0.749)



ROC of BMI with metabolic syndrome (AUC=0.733)



CONCLUSIONS

- Metabolic syndrome and insulin resistance occur at very early age in obese children – 11 years
- Metabolic syndrome and co- morbidities can be diagnosed by simple clinical and biochemical test
- HOMA-IR – early valuable tool for diagnosing insulin resistance
- HOMA-IR of 3.48, Waist circumference of 75.5cms, BMI of 24.73kg/m2 best predicted the occurrence of metabolic abnormalities

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