IMPLICATIONS OF INSULIN RESISTANCE IN OBESE AND OVERWEIGHT CHILDREN : A COHORT ANALYSIS

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NO CONFLICT OF INTEREST. NO FUNDING

INTRODUCTION

- Both obesity and diabetes have shown a dramatic increase worldwide, both in adult and pediatric population.
- Insulin resistance gives way to frank diabetes.
- Hence its imperative to study insulin resistance in obese children.

OBJECTIVES

Primary: To evaluate insulin resistance in obese & overweight children.
Secondary:To examine the co-morbidities in obese children.

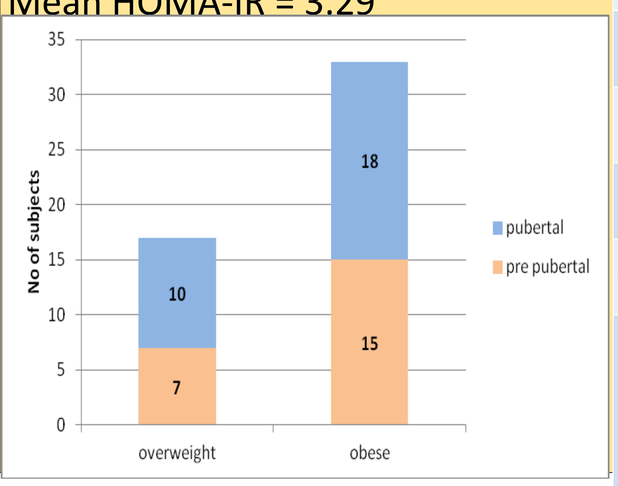
METHODS

- Approval from Institutional Ethics Committee taken
- Fifty 5-18years overweight and obese children (>90th percentile of WHO charts)
- Informed assent/consent taken.
- Cross sectional observational study
- Data collected -
- ✓Anthropometric(weight,height,Body mass index, waist circumference),
- ✓Clinical (Blood Pressure),
- ✓ Biochemical (fasting and post prandial blood glucose, lipid profile, fasting and post prandial insulin) data
- ✓Ultrasound- fatty liver
- **Insulin resistance** – HOMA (homeostasis model assessment index) >3.5
- HOMA –IR = fasting glucose(mg/dl)* fasting insulin(mU/L) / 405
- Hypertension – BP>95thcentile of age and gender matched data
- Abdominal obesity- > 90th percentile of ethinic specific waist circumference data
- Dyslipidemia - Total Cholesterol ≥ 200mg/dl / Triglycerides ≥130mg/dl/ HDL ≤ 35mg/dl/ LDL ≥ 130mg/dl as per National Cholesterol Education Program expert panel on cholesterol levels in children
- Correlation between various parameters done.

RESULTS

BASELINE DATA

Mean age =>10.76±2.48years
BMI => 24.18±3.12kg/m2
WC => 72.55±9.12cms
Fasting and post prandial blood glucose, fasting insulin, lipid Profile – normal limits.
Mean HOMA-IR = 3.29



Characteristics	Total(n=50) (%)
Abdominal obesity (WC≥90th percentile)	33(66)
Hypertension	15 (30)
Dyslipidemia	15(30)
Insulin resistance	18 (36)
Metabolic syndrome	9 (18)
Acanthosis nigricans	4(8)
NAFLD (Non Alcoholic Fatty Liver Disease)	9 (18)

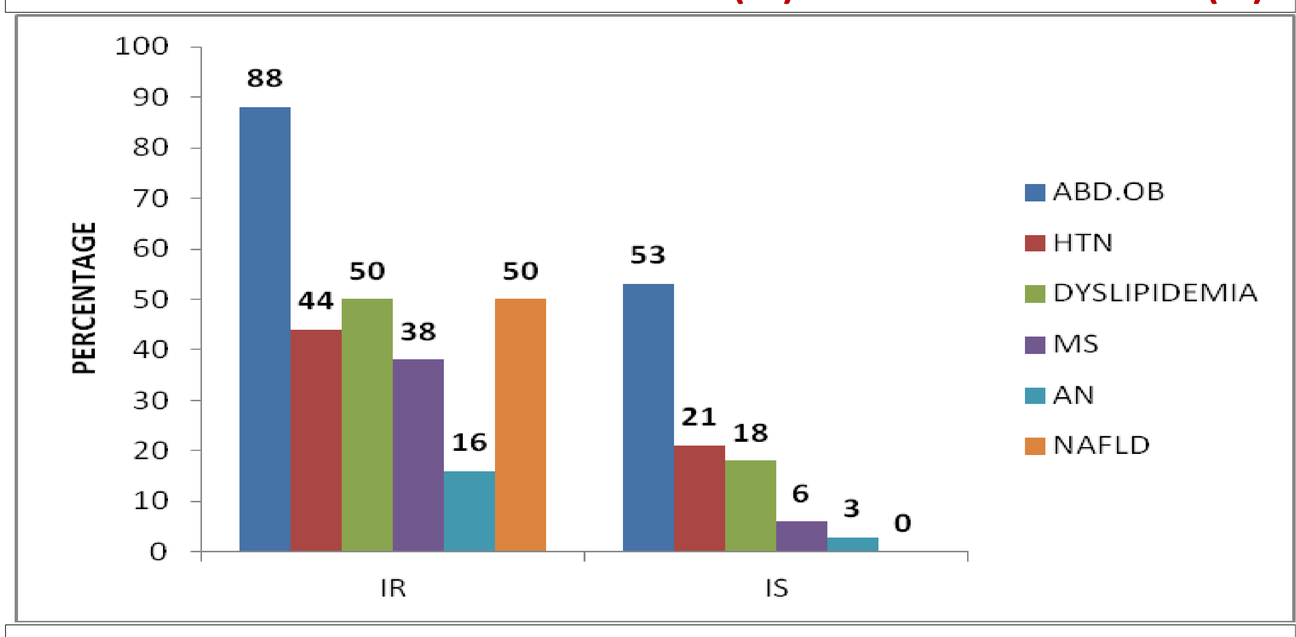
INSULIN RESISTANCE

Of 50 subjects – 18 insulin resistant.
Higher - BMI (24.89±3.06 vs 23.78±3.14 kg/m2) and
- waist circumference (76.02±8.07 vs 70.6±9.21cms)
Pubertal children more prevalence of insulin resistance (46.4% vs 22.7%)

COMPARISON - INSULIN RESISTANT & INSULIN SENSITIVE SUBJECTS

Parameter	Insulin resistant (n=18)	Non insulin resistant (n=32)	P
FPG (mg/dl)	86.6±7.1	80.6±6.4	0.00
PPPG (mg/dl)	117.3±13.4	109.5±9.6	0.02
Fasting insulin(µU/ml)	21.45±2.32	12.86±2.57	0.00
2hr insulin(µU/ml)	25.69±4.02	17.30±3.76	0.00
HOMA-IR	4.58±0.82	2.56±0.59	0.00
Cholesterol (mg/dl)	156.6±29.5	142.1±19.2	0.04

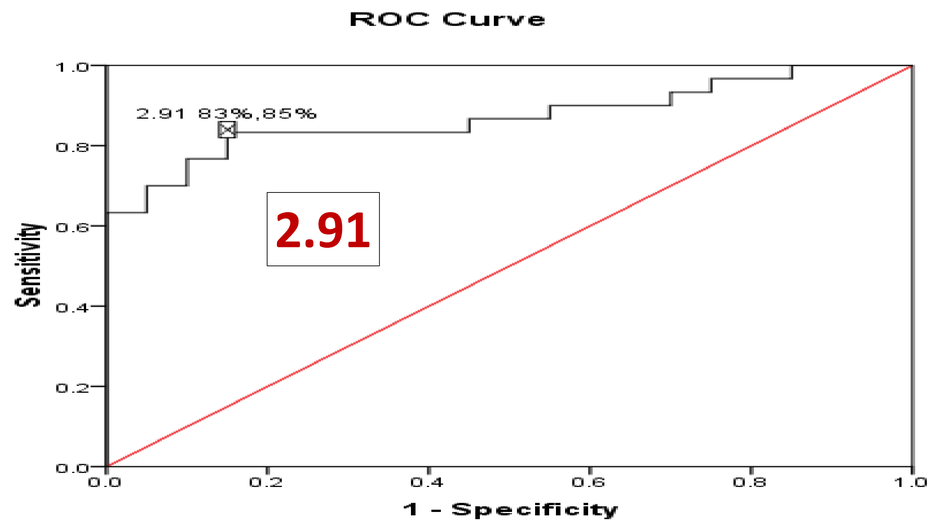
COMORBIDITIES IN INSULIN RESISTANT(IR) & INSULIN SENSITIVE (IS)



CORRELATION OF INSULIN RESISTANCE

HOMA-IR values correlated significantly and positively with
- Post prandial glucose (r=0.46)
- Post prandial insulin(r=0.79)
- Total cholesterol (r=0.28)

ROC CURVE ANALYSIS OF HOMA VALUES IN THE STUDY BASED ON PRESENCE AND ABSENCE OF METABOLIC ABNORMALITIES. (AUC=0.87).



CONCLUSIONS

- Insulin resistance is observed more in pubertal age group (46.4%).
- Its associated with increased risk of other co-morbidities like dyslipidemia, hypertension.
- HOMA of 2.91 best predicted the occurrence of metabolic abnormalities and had positive correlation with post prandial glucose, insulin and total cholesterol
- Early evaluation of insulin resistance and metabolic derangements mandatory for sensitization and interventions.

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