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 (µU/mL) / 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: < 40 mg/dL (1.03 mmol/L)
    - Hypertension or previously diagnosed hypertension (SBP ≥ 130 mmHg, DBP ≥ 85 mmHg)
    - Elevated FPG ≥ 100 mg/dL
- Receiver 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)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MS</th>
<th>Non-MS</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waist circumference (cm)</td>
<td>80.8±5.3</td>
<td>70.7±8.77</td>
<td>0.00</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>118±7.2</td>
<td>111±9.5</td>
<td>0.06</td>
</tr>
<tr>
<td>FPG (mg/dl)</td>
<td>88.1±9.4</td>
<td>81.6±6.1</td>
<td>0.01</td>
</tr>
<tr>
<td>PPGP (mg/dl)</td>
<td>125.4±12.7</td>
<td>109.4±9.2</td>
<td>0.00</td>
</tr>
<tr>
<td>Fasting insulin (µU/ml)</td>
<td>19.2±5.6</td>
<td>15.2±4.4</td>
<td>0.02</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>4.17±1.35</td>
<td>3.10±1.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>164.6±29.8</td>
<td>117.4±19.2</td>
<td>0.00</td>
</tr>
</tbody>
</table>

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 75.5 cm, BMI of 24.73 kg/m2 best predicted the occurrence of metabolic abnormalities

REFERENCES

1) Misra A, Khurana L. Obesity and metabolic syndrome in developing countries. J Clin Endocrinol Metab. 2006; 91: 3147-3156