**INTRODUCTION**

- Obese children are known to be at high risk for vascular complications.
- There is paucity in Indian literature regarding the onset and magnitude of vascular complications.
- Carotid intima media thickness (cIMT) and Brachial artery distensibility (FMD) are known to predict future atherogenesis.

**OBJECTIVES**

- **Primary:** To compare vascular parameters of obese children aged 5-18 years with age and sex matched controls.
- **Secondary:** To correlate vascular changes with pubertal onset in obese children.

**METHODS**

- Approval from Institutional Ethics Committee taken.
- Eighty children, 40 obese and 40 age & sex matched controls aged 5 to 18 years recruited.
- Informed assent/consent taken.
- Cross sectional observational study.
- Vascular parameters measured by echocardiography (Philips IE 33 Xmatrix Sys).
- Anatomical variable - Carotid intima media thickness (cIMT) - measuring near and far wall thickness of the artery as the difference between two echogenic lines of the vessel wall (luminal-intimal interface and upper layer of adventitia).
- Physiological variable - Brachial artery scanned in longitudinal section 2-15 cm above elbow. Scans taken at rest, during reactive hyperemia, again at rest, and after sublingual glyceryltriuritate (GTN) spray.
- Endothelium dependent dilatation - Reactive hyperemia by inflating BP cuff of 300 mm Hg for 4 minutes, then deflating it. 2nd scan was taken after 45-60 sec of cuff deflation. After 10 minutes, a resting scan was recorded.
- Endothelium independent vasodilation - GTN sublingual spray (0.4mg) given and artery scanned 3 minutes later. Images of vessel recorded after drug administration and difference in diameter noted.
- This measured difference was indicator of arterial distensibility.
- The mean intra observer error of cIMT measurements was 0.041 ± 0.025 mm. The inter observer intraclass correlation coefficients (p) and coefficients of variation (CV) were excellent and comparable between FMD, GTN and cIMT.

**RESULTS**

- Mean age of study population = 11.15 ± 2.52 years.
- Mean age of prepubertal = 8.84 ± 1.17 years
- Mean age of postpubertal = 13.24 ± 1.22 years
- M : F ratio = 23 : 17

<table>
<thead>
<tr>
<th>OBESE</th>
<th>CONTROL</th>
<th>p value</th>
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<tbody>
<tr>
<td>BMI</td>
<td>26.58 ± 1.88</td>
<td>17.58 ± 1.72</td>
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<tr>
<td>FMD</td>
<td>2.0 ± 0.06</td>
<td>2.2 ± 0.05</td>
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<tr>
<td>GTN</td>
<td>4.6 ± 0.23</td>
<td>6.2 ± 0.31</td>
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<tr>
<td>cIMT</td>
<td>0.87 ± 0.14</td>
<td>0.57 ± 0.07</td>
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- On comparing obese and controls, cIMT and Flow Mediated Dilation (FMD) was significantly elevated in obese.
- However difference in GTN induced vasodilatation was comparable.

**EFFECT OF PUBERTY ON VASCULAR PARAMETERS:**

- cIMT was significantly higher in postpubertal (p<0.01) in comparison to prepubertal obese.
- FMD and GTN induced vasodilatation were comparable (P=0.49, 0.22).
- 21/40 (52.5%) obese (17 postpubertal and 4 prepubertal) had cIMT greater than the normal cutoff of 0.59 mm.

**CONCLUSIONS**

- Our obese cohort had evidence of subclinical vascular alterations (Dec. endothelial dependent vasodilatation and increased carotid intima media thickness (0.87mm) seen in obese.)
- So the mean age of developing these early vascular changes was 14.96±0.84 yrs.
- cIMT was higher in 80% of postpubertal obese indicating that with age and puberty, there is further progression of atherogenesis.
- Thus a need for early screening for cardiovascular morbidities and periodic evaluation in asymptomatic obese children to prevent adverse outcomes of Cardiovascular diseases in adulthood.
- A larger sample size would add to better knowledge on the timing of onset of cardiovascular alterations in obese children.

**REFERENCES**

1. WHO growth charts 2006
3. Iannetti et al Am J Cardiol 2006