INTRODUCTION:
There is a rapidly escalating Coronary artery disease (CAD) epidemic among Asian Indians. Asian Indians have low rates of standard risk factors but the highest rates of premature CAD. Recently, Shojai et al(2009) and Pineda et al(2009) intro- duced high levels of fibrinogen as a risk factor for premature CAD in subjects <55 years. Green et al (2009) attributed this acute phase protein a role in subclinical atherosclerosis. Supportive data had previously shown that fibrinogen is involved in the subclinical phase of extra coronary and coronary atherosclerosis and may add to the atherogenic effect of hyperlipidemia. Plasma fibrinogen is an independent and newer risk factor for IHD. Normal plasma fibrinogen levels are 2 to 4.5 gm/L. Fibrinogen increases the blood viscosity and plays a key-role in thrombosis. Fibrinogen is an acute phase reactant that is in- creased in inflammatory states. It represents an inflammatory marker that appears to be implicated in the pathophysiology and prognosis of CAD. Its presence contributes to the formation of atheromatous plaque.正常 Plasma fibrinogen levels are 2 to 4.5 gm/L. Fibrinogen increases the blood viscosity and plays a key-role in thrombosis. Fibrinogen is an acute phase reactant that is in- creased in inflammatory states. It represents an inflammatory marker that appears to be implicated in the pathophysiology and prognosis of CAD. Its presence contributes to the formation of atheromatous plaque. Plasma fibrinogen levels were determined in cases and controls by functional Clauss method. Significant elevation in Plasma Fibrinogen levels was observed in cases as compared to controls with significant p value. (p value < 0.001). Fibrinogen is a risk factor for CAD & it may be a useful screening tool to identify persons at increased thrombotic risk.

MATERIALS AND METHODS:
This is a case control study conducted on 60 cases of IHD who were admitted at Civil hospital, Ahmadabad during the period of January 2013 to December 2013 and 50 age and sex matched healthy control subjects. IHD was defined as the occurrence of Myocardial infarction (MI) or characteristic symptoms of angina pectoris based on location, character and duration of pain and Treadmill test (TMT) positive or Coronary Angiography (CAG) proven cases of IHD. A diagnosis of MI was based on the clinical details of patients and recorded in a performa. About 3-4 ml of patient's blood sample was collected by a clean venipuncture in EDTA 4 ml vials. Plasma fibrinogen levels were determined by the functional Clauss method. The results were analyzed by student’s t-test and p value was calculated by using graphpad software.

OBSERVATION AND RESULTS:
Mean age of cases is 44.43 ± 9.46 years and that for controls is 45.88 ± 10.56 years. The mean levels of plasma fibrinogen in both the cases and controls are as shown in table 1.

Table 1: Plasma Fibrinogen levels (Mean ± SD) in case and controls along with the p value

<table>
<thead>
<tr>
<th>Cases (Mean ± SD)</th>
<th>Controls (Mean ± SD)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 ± 0.31</td>
<td>2.7 ± 0.29</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Plasma Fibrinogen levels were found to be significantly elevated in cases as compared to controls with significant p value (p value <0.001).

DISCUSSION:
Elevation in Plasma Fibrinogen levels in IHD as observed in the present study correlates well with other similar studies.1,6,11,13. This has been clearly depicted in table 2.

Table 2: A comparative study of plasma fibrinogen levels (gm/L) in IHD

<table>
<thead>
<tr>
<th>Study</th>
<th>Cases (Mean ± SD)</th>
<th>Controls (Mean ± SD)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panwar et al(2011)</td>
<td>3.8</td>
<td>2.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Assmann et al(1996)</td>
<td>3.3</td>
<td>2.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Stec et al(2000)</td>
<td>3.28</td>
<td>3.03</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Meade et al(1986)</td>
<td>3.15</td>
<td>2.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Present study</td>
<td>3.2</td>
<td>2.7</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The above findings demonstrate a strong correlation between Plasma Fibrinogen levels and Ischaemic Heart Disease.

In my present study, mean fibrinogen levels in cases is significantly higher than the mean fibrinogen levels in controls (p<0.001) but the mean fibrinogen levels in both the cases and controls fall within its normal reference range. Similar results were reported by Lima et al(2012) and Giannitsis et al (2009) who found that the mean values for the plasma levels of fibrinogen increased progressively as the CAD became more severe, although these values remained within the normal range.

The Framingham Study by Kannel et al (1997) found that plasma fibrinogen is a consistent risk factor for coronary artery disease. Thompson et al (1995) found fibrinogen to be a strong predictor of coronary events in patients with angina pectoris. In those subjects with high total cholesterol, a high fibrinogen level conferred added risk compared with those with low fibrinogen levels. Panwar et al (2011) showed that premature coronary artery disease in Indians is due to combination of thrombotic (high fibrinogen) and atherogenic risk factors (high LDL, low HDL and high Triglycerides).

However, conflicting data has also been reported by Lawlor et al (2005) and he showed no association between fibrinogen levels and CAD. Lawlor et al found that adjustment for all potential confounding factors attenuated the association between fibrinogen and CAD.

CONCLUSION:
The present study identifies the association of raised plasma fibrinogen levels with IHD. Fibrinogen acts as a link between inflammation and Coronary Artery Disease. Fibrinogen is an important mediator of cell–cell interaction, adhesion and inflammation. Fibrinogen participates in the formation of atherosclerotic plaque during the first stages of CAD, suggesting that it is a causative factor rather than a result. Thus, it can be concluded that fibrinogen is a risk factor for CAD and it may be a useful screening tool to identify persons at increased thrombotic risk.

KEYWORDS:
Fibrinogen, Ischaemic Heart Disease, Plasma Fibrinogen, Coronary artery disease (CAD), Premature CAD.
REFERENCES:


