The measurement of serum fibrinogen levels in patients with acute coronary syndrome

Mohammad T. Omran, MD, Simin Asadollahi, MD.

ABSTRACT

Objectives: Serum fibrinogen level (SFL) is thought to be one of the risk factors for coronary artery disease (CAD). The purpose of this study was to measure the SFL in patients with acute coronary syndrome (ACS).

Methods: This descriptive, analytical study was performed on patients with ACS admitted at the Department of Cardiology, Shahid Beheshti Hospital in Babol, Iran, from February 2005 to June 2006. Two hundred patients with ACS were divided into 4 groups: Group I - ST elevated myocardial infarction (STEMI); Group II - non-ST elevated myocardial infarction (NSTEMI); Group III - unstable angina (U/A) with ST-T change; and Group IV - U/A without ST-T change. Each group includes 50 patients. Twenty-four hours after admission, the SFL was measured using chromatography methods. The data were collected and analyzed.

Results: The mean SFL per mg/dl in each group are: Group I - 377.8 ± 28, Group II - 417.2 ± 26.8, Group III - 335.4 ± 19.8, and Group IV - 305.1 ± 13.8. The SFL in Group II was significantly higher than the other groups (p=0.002). The SFL in Group II was higher than in Group III (p=0.02), and much higher than in Group IV (p=0.000). The SFL in Group III was more than in Group IV (p=0.018).

Conclusion: The results show that SFL is an important marker in patients with ACS, with ST-T change.

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II - non-ST elevated myocardial infarction (NSTEMI), Group III - U/A with ST-T change, and Group IV - U/A without ST-T change. Each group has 50 patients. The SFL was measured 24 hours after admission, using chromatography (Fibrinogen with bio-fibrinogen kit, Biolabo Co., France). In this method, fibrinogen-clotting time was measured, and fibrinogen quantity levels were calculated. The findings were analyzed in 4 groups using Statistical Package for the Social Science, Chi-square, and Kruskal-Wallis and Mann whitentest.

**Results.** Among the 200 patients with ACS, males (n=101) were more than females (n=99) (p=0.03). The mean age of patients were 59.2 ± 12.8 (Group I), 65 ± 11.6 (Group II), 61.3 ± 11.1 (Group III), and 62.2 ± 10.3 (Group IV). In these 4 groups, there was no significant difference between the risk factors for atherosclerosis. The mean SFL, per mg/dl on each group were 377.8 ± 28 (Group I), 417.2 ± 26.8 (Group II), 335.4 ± 19.8 (Group III), and 305.1 ± 13.8 (Group IV), (p=0.002) (Table 1). There were no significant difference between mean SFL in Groups I and II, (p=0.074), Group III, (p=0.823), and Group IV (p=0.077). There were significant differences between SFL in Groups II and III (p=0.02), and in Group IV (p=0.000). The SFL in Group II were more than those of Groups III and IV, while Group III was more than in Group IV (p=0.018).

**Discussion.** In this study, the SFL in Group II was more than those other groups. The SFL in Group III was more than in Group IV, while the SFL in Group I did not show any increase compared with the other groups. Taneli et al. measured the level of SF, and showed that the SFL in patients with stable angina were higher than that in the control group, but they did not show any difference between SFL in patients with AMI and the control group. However, the study by Lin et al. showed higher levels of SF in patients with ACS, as compared with the control group. Bennermo et al did not find any association between CRP and fibrinogen levels in prognosis of the patients with non-Q-wave, AMI, and U/A, and patients with AMI that was treated by thrombolytic agents. In the study by Retterstol et al., it showed that high SFL is one of the most important factors for the prognosis of patients with CAD. Danesh et al showed a relation between SFL, and complication, or mortality of patients with CAD, and that high SFL is associated with CAD and stroke. In our present study, we have concluded that there is a relationship between SFL and CAD, and the high SFL in patients with ACS associated with ECG change. We recommend that SFL should be measured in all patients with the diagnosis of ACS.

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**References**


**Table 1** - Baseline characteristics and results (n=50).*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>59.2 ± 12.8</td>
<td>65 ± 11.6</td>
<td>61.3 ± 11.1</td>
<td>62.2 ± 10.3</td>
<td>0.88</td>
</tr>
<tr>
<td>Male/Female</td>
<td>34/16</td>
<td>35/27</td>
<td>30/50</td>
<td>35/26</td>
<td>0.03</td>
</tr>
<tr>
<td>Cigarette smoker</td>
<td>12 (24)</td>
<td>8 (16)</td>
<td>13 (26)</td>
<td>5 (10)</td>
<td>0.149</td>
</tr>
<tr>
<td>Hypertension</td>
<td>35 (70)</td>
<td>30 (60)</td>
<td>25 (50)</td>
<td>31 (62)</td>
<td>0.236</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>13 (26)</td>
<td>16 (32)</td>
<td>17 (34)</td>
<td>35 (70)</td>
<td>0.843</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>14 (28)</td>
<td>12 (24)</td>
<td>18 (36)</td>
<td>15 (30)</td>
<td>0.614</td>
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<tr>
<td>Familial history</td>
<td>14 (28)</td>
<td>11 (22)</td>
<td>15 (30)</td>
<td>14 (28)</td>
<td>0.822</td>
</tr>
<tr>
<td>Serum fibrinogen level (mg/dl)</td>
<td>377.8 ± 28</td>
<td>417.2 ± 26.8</td>
<td>335.4 ± 19.6</td>
<td>305.1 ± 13.8</td>
<td>0.002</td>
</tr>
</tbody>
</table>

*Values are mean ± SDs or numbers of patients (percentages).


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