Assessment of Serum Albumin in Coronary Artery Disease

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Abstract:

Coronary artery disease (CAD) is a major cause of cardiovascular death worldwide. Prevalence of CAD is highly variable among different races. Indians constitute a fifth of the global population, and the higher rates of CAD in this population constitute a major health challenge. Indians have been noted to have the highest CAD rates and the conventional risk factors fail to explain this difference completely. Serum albumin (SA) is reported as a useful risk-stratification tool in cardiovascular diseases such as acute coronary syndrome or heart failure. SA concentration aids in risk prediction in various clinical settings. It is of interest to understand the prognostic value of SA in the full spectrum of cardiovascular disease. This study was conducted totally on 50 human subjects of older than 18 years of age. Among the 50 human subjects, 25 were healthy controls and 25 were coronary artery disease cases. Serum albumin is decreased in coronary artery disease cases than healthy controls with a high statistical significance with the P value <0.001. Hence it should be made mandatory that estimation of serum albumin should be made as a routine investigation for diagnostic tool in coronary artery disease and risk of myocardial infarction.

Keywords: Serum Albumin, Cardiovascular, Coronary artery disease, Myocardial infarction


Introduction:

Coronary artery disease (CAD) is known to have increased risk of cardiovascular events (1). It is the foremost cause of disability & death the world over and is one of the top five causes of death in Indian population (2). Increasing incidences of atherosclerotic cardiovascular diseases have become a growing source of global disease burden, thereby leading to a significant rise in global morbidity and mortality (3). Serum albumin (SA), the most abundant circulatory protein, is associated with several vital physiological functions, such as maintaining oncotic pressure & microvascular integrity, regulating metabolic and vascular functions, providing binding ligands for substances, antioxidant activities and anticoagulant effects (4, 5). An increased risk in all-cause mortality and cardiovascular (CV) mortality has been shown to be associated with low SA concentration (6). Hypoalbuminemia has been shown to increase blood viscosity and cause endothelial dysfunction (7, 8, 9). It is well known that Hypoalbuminemia is associated with adverse outcomes in various critical illnesses, especially cardiovascular disease, stroke, sepsis & coronary artery disease (10, 11, 12). There are several study investigated the association between low albumin concentration and adverse cardiovascular events in coronary artery disease including myocardial infarction & heart failure (13). However, the prognostic significance of low albumin level at admission in patients with CAD is not well established. Therefore the aim of this project is to evaluate whether low serum albumin is associated with CAD and risk of myocardial infarction.

**Material & Method:**

The present Case-Control study was carried out in the department of Biochemistry in Saveetha Medical College & Hospital, Chennai. The study was conducted prospectively with the approval from the Institutional Ethical Committee (IEC). The Case-Control study was carried out to determine the assessment of serum albumin in coronary artery disease and the study included 50 human subjects of older than 18 years of age. Among the 50 human subjects, 25 were controls and 25 were coronary artery disease cases. The cases and controls were selected from patients attending the Out Patient Department (O.P.D) and In Patient Department (I.P.D) of Saveetha Medical College & Hospital, Satisfying the Inclusion and Exclusion Criteria. Coronary artery disease cases and controls older than 18 years of age both sexes were included. Patients with history and known hypertension, diabetes mellitus, coronary artery disease, renal disease, liver disease, stroke were included. Informed consent was obtained from all the participants. The informed consent was taken from every patient after full explanation of the study. We have analyzed serum albumin in VITROS 5600 automated analyzer. Values were analyzed is spss software V25.

**Result**

In our study serum albumin is estimated in 50 human subjects out of whom 25 were apparently healthy controls and 25 were cases of coronary artery disease. Serum albumin is compared between healthy controls and cases of coronary artery disease. The levels of the analysed serum albumin in the 50 human subjects of older than 18 years of age are tabulated in Table-1 & Table-2. In our study 72% were men and 18% were women in healthy controls. 72% were men and 18% were women in coronary artery disease cases which are tabulated in Table-3, hence prevalence of coronary artery disease cases is more in men in our study. The Serum Albumin is decreased...
in coronary artery disease cases than healthy controls. The results showed a good positive co-relation and high statistical significance with a P-value of <0.001 which are shown in Table-4.

DISCUSSION

In our study serum albumin is estimated in 50 human subjects out of whom 25 were apparently healthy controls and 25 were cases of coronary artery disease. Serum albumin is compared between healthy controls and cases of coronary artery disease. Serum albumin levels varied between 3.6g/dl to 5.2g/dl for healthy controls and 1.5g/dl to 3.4g/dl for coronary artery disease. Serum albumin reference range [3.5 g/dl -5.5g/dl] quoted in the kit methodology adopted for its analysis. The mean level of serum albumin with Standard deviation for healthy controls was 4.2±0.44 and for coronary artery disease cases are 2.8±0.50. In our study there was a significant decrease in serum albumin levels coronary artery disease cases when compared to healthy controls. The range of serum albumin levels varied between 3.6g/dl to 5.2g/dl for healthy controls and 1.5g/dl to 3.4g/dl for coronary artery disease cases. The decrease in serum albumin in for coronary artery disease cases showed a high statistical significance with a P-value of <0.001. The association between low albumin and increased risks of cardiovascular disease and heart failure is reported in several studies (14,15).

1. The highlighted showed so much similarity. Re-phrase the sentence in the results
2. In discussion you need to compare other studies with your study

CONCLUSION

From the results and discussion held so far and by comparison of serum albumin between healthy controls & coronary artery disease cases the following are concluded. The prevalence of coronary artery disease is more in men (72%). Serum albumin levels are decreased in coronary artery disease cases than healthy controls with a high statistical significance of P value <0.001. Hence it should be made mandatory that estimation of Serum albumin should be made as a routine investigation of middle age individual as a diagnostic tool for Coronary artery disease and risk of myocardial infarction.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Significance p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>2.8</td>
<td>±0.50</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 1: Coronary artery disease cases

Table 2: Healthy controls
Table 3: Sex distribution in healthy controls and coronary artery disease cases:

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of Subjects</th>
<th>Males(%)</th>
<th>Females(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls</td>
<td>25</td>
<td>18 [72%]</td>
<td>7 [18%]</td>
</tr>
<tr>
<td>Cases</td>
<td>25</td>
<td>18 [72%]</td>
<td>7 [18%]</td>
</tr>
</tbody>
</table>

Table 4: Comparison of serum Albumin levels between healthy Controls and coronary artery disease cases

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control(n=25)</td>
<td>4.2</td>
<td>±0.44</td>
</tr>
<tr>
<td>Case(n=25)</td>
<td>2.8</td>
<td>±0.50</td>
</tr>
</tbody>
</table>

Reference:


