Ascitic Fluid and Serum Cholesterol, Triglyceride and Protein in ascites of Liver Cirrhosis, Tuberculosis and Malignancy

Seth Seema¹, Seth Sharad²

ABSTRACT

Introduction: Ascites defined as a pathological accumulation of fluid in the peritoneal cavity is the initial manifestation of many systemic diseases. Conventional biochemical tests and cytology still pose a diagnostic dilemma in a large number of patients. We determined the levels of cholesterol, triglyceride and proteins in the ascitic fluid and serum of patients with ascites due to liver cirrhosis, abdominal tuberculosis and malignancy to find out whether these parameters could be used as tests in differentiating ascites due to the above mentioned causes.

Material and Methods: This was a prospective study on 30 patients of ascites admitted in the medical and surgical wards of our institution between August 2014 and July 2015. Serum and ascitic fluid total protein, albumin, cholesterol and triglyceride levels were measured as were the serum ascitic albumin, protein, cholesterol and triglyceride gradients.

Results: Serum ascites albumin gradient was higher in liver cirrhosis as compared to tuberculous and malignant ascites and this difference was highly significant (P <0.001 in each). Serum and ascitic fluid triglyceride gradient was higher in malignant ascites as compared to that observed in liver cirrhosis and tuberculosis, the difference was statistically significant (P <0.01). Highest levels of serum cholesterol were recorded in malignant ascites.

Conclusion: Serum ascites albumin gradient is a good marker to differentiate between ascites due to liver cirrhosis and tubercular or malignant ascites. Serum and ascitic fluid triglyceride gradient and serum cholesterol levels are higher in malignancy as compared to tuberculosis or liver cirrhosis.

Keywords: Ascites, Ascitic fluid, Serum cholesterol, triglyceride, protein

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INTRODUCTION

Ascites due to liver cirrhosis, tuberculosis and malignancy is a very common clinical problem. Distinction between the three using conventional parameters is at times very difficult due to considerable overlap. Lactate dehydrogenase, glucose concentration, fibrinogen degradation products have all been investigated but none provides a complete distinction between the various types of ascites. A high ascitic fluid protein level although a constant finding in malignant ascites has also been reported in upto 25% patients with chronic liver disease. Cytological examination despite its high specificity is unreliable as its sensitivity is only 60%. The present study was therefore undertaken to determine the ascitic fluid and serum levels of cholesterol, triglyceride and proteins in patients with liver cirrhosis, tuberculosis and malignancy and to determine whether they had any diagnostic value in differentiating ascites from the above causes.

MATERIAL AND METHODS:

The present study was a prospective observational study conducted on 30 patients of ascites admitted in the indoor medical and surgical wards between the period August 2014 – July 2015. Due permission was taken from the hospital ethical committee to carry out this study. Only patients of liver cirrhosis, tuberculosis and malignancy were included in this study. They were divided into three groups. The diagnostic criteria were as follows: Liver Cirrhosis: Patients with a history of jaundice and alcoholism. Deranged liver function tests and ultrasound confirmation of the same. Abdominal tuberculosis: History of pulmonary tuberculosis, positive Mantoux test, raised adenosine deaminase in ascitic fluid and biopsy revealing granulomas and AFB. Malignancy: Primary malignancy isolated elsewhere in the body, cytology showing malignant cells, peritoneal biopsy positive for malignancy. All patients underwent ultrasound guided abdominal paracentesis and simultaneously a 3ml of venous sample was also drawn out for total protein, albumin, triglyceride and cholesterol estimation. All patients in addition also had a complete blood count, Liver function tests, plain X-ray chest PA view, adenosine deaminase in ascitic fluid. Estimation of total proteins was done by the Biuret method (Henry et
al., 1974); albumin levels by the BCG method suggested by
(Doumas et al., 1971)6 Cholesterol estimation by the enzymatic
method (Allain, 1974)7 and Triglyceride by the enzymatic
method (Eggstein et al. 1974).8 All the data was entered into
a specifically designed proforma for this purpose.

**STATISTICAL ANALYSIS**

Data represented as frequencies, range, mean, standard devi-
tion was processed in MS EXCEL and statistically analyzed
by unpaired Student’s t test. A two tailed probability value of
< 0.05 was taken as indicating significance.

**RESULTS**

The commonest cause of ascites was liver cirrhosis (53.4%)
followed by malignancy (26.6%) and tuberculosis (20%).
Liver cirrhosis was common in the age group 41-50 years,
tubercular ascites in the age group 21-30 years and malig-
nant ascites was common in the age group 61-70 years (Fig.
1). The values of ascitic fluid protein in tuberculosis (4.3 ±
1.54g/dl) and malignant ascites (3.72 ± 1.47g/dl) was
higher than in liver cirrhosis (1.56 ± 0.17 g/dl) and this was
statistically significant (P < 0.01), however no significant
difference in the ascitic fluid total protein and albumin ex-
isted between malignant and tubercular ascites. The ascit-
ic fluid cholesterol in tuberculosis (81.83 ± 29.32mg/dl) and
malignant ascites (93.25 ± 41.90mg/dl) was higher than in
liver cirrhosis (35.12 ± 6.35mg/dl) and significantly so (P
<0.01). Ascitic fluid triglyceride levels were also higher in
malignant and tubercular ascites as compared to liver cir-
rhosis. The corresponding values being 85.12 ± 34.92mg/dl,
68.50 ± 20.08mg/dl and 51.25 ± 26.61mg/dl (P <0.05)
(Table1). Serum total protein levels showed no difference (P
>0.05) with values within normal limits i.e. 6.6-8.3g/dl in
all three groups. Higher levels of serum cholesterol (162.6
± 39.66mg/dl) were recorded in patients of malignant ascites
which was significantly different from tubercular ascites (116.5
± 15.66mg/dl, P <0.05) and liver cirrhosis (120.25 ±
35.86mg/dl, P <0.05). Serum triglyceride (172 ± 51.99mg/dl)
was higher in malignant ascites as compared to tubercular
patients (114.8 ± 16.24mg/dl, P <0.05) and those with
cirrhosis (98.87mg/dl, P <0.01)(Table2). Serum and ascitic
fluid gradient of albumin in liver cirrhosis (1.53 ± 0.001g/dl)
was significantly higher as compared to tuber-
cular abdomen (1.07 ± 0.18g/dl) and malignancy (1.03 ± 0.28g/dl),
P <0.001 in both cases. Serum and ascitic fluid cholesterol
gradient was highest in cirrhosis (85.12 ± 29.51mg/dl) as
compared to malignant (69.37 ± 2.23mg/dl) and tubercular
(34.67 ± 13.66mg/dl) patients. Serum and ascitic triglycer-
ide gradient in malignancy (72 ± 17.07mg/dl) when com-
pared to liver cirrhosis (47.62 ± 8.39mg/dl) and tuberculo-
sis (46.33 ± 3.84mg/dl) was significantly higher (P <0.01)
(Table 3).

### Table 1: Ascitic fluid protein, albumin, cholesterol, triglyceride

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Groups</th>
<th>Total Protein (gm/dl) Mean</th>
<th>Albumin (gm/dl) Mean</th>
<th>Cholesterol (mg/dl) Mean</th>
<th>Triglyceride (mg/dl) Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuberculosis</td>
<td>4.30</td>
<td>1.98</td>
<td>81.83</td>
<td>68.50</td>
</tr>
<tr>
<td>2</td>
<td>Malignancy</td>
<td>3.72</td>
<td>1.86</td>
<td>93.25</td>
<td>85.12</td>
</tr>
<tr>
<td>3</td>
<td>Liver cirrhosis</td>
<td>1.56</td>
<td>0.92</td>
<td>35.12</td>
<td>51.25</td>
</tr>
</tbody>
</table>

### Table 2: Serum total protein, albumin, cholesterol, triglyceride

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Groups</th>
<th>Total Protein (gm/dl) Mean</th>
<th>Albumin (gm/dl) Mean</th>
<th>Cholesterol (mg/dl) Mean</th>
<th>Triglyceride (mg/dl) Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuberculosis</td>
<td>7.35</td>
<td>3.06</td>
<td>116.5</td>
<td>114.8</td>
</tr>
<tr>
<td>2</td>
<td>Malignancy</td>
<td>6.9</td>
<td>2.90</td>
<td>162.6</td>
<td>172.0</td>
</tr>
<tr>
<td>3</td>
<td>Liver cirrhosis</td>
<td>6.67</td>
<td>2.46</td>
<td>120.25</td>
<td>98.87</td>
</tr>
</tbody>
</table>

### Table 3: Serum to ascitic fluid gradient of albumin, cholesterol and triglyceride

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Groups</th>
<th>Serum Ascites albumin gradient (g/dl)</th>
<th>Serum Ascites cholesterol gradient(mg/dl)</th>
<th>Serum ascites triglyceride gradient(mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuberculosis</td>
<td>1.07 ± 0.18</td>
<td>34.67 ± 13.66</td>
<td>46.33 ± 3.84</td>
</tr>
<tr>
<td>2</td>
<td>Malignancy</td>
<td>1.03 ± 0.28</td>
<td>69.37 ± 2.23</td>
<td>72 ± 17.07</td>
</tr>
<tr>
<td>3</td>
<td>Liver cirrhosis</td>
<td>1.53 ± 0.001</td>
<td>85.12 ± 29.51</td>
<td>47.62 ± 8.39</td>
</tr>
</tbody>
</table>
REFERENCES


CONCLUSION

Serum ascites albumin gradient is a good marker to differentiate between ascites due to liver cirrhosis and tubercular or malignant ascites. Serum and ascitic fluid triglyceride gradient and serum cholesterol levels are higher in malignancy as compared to tuberculosis or liver cirrhosis.

REFERENCES


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