C-Reactive Protein in Patients with Diagnoses of Cholecystitis

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Abstract

Objective: The objective of this study was to find out the association of c reactive protein in patients with cholecystitis.

Study Design and Setting: This case–control observational study has been carried out in general surgery department of LUMHS.

Duration: Duration was 8 months from December 2015 to May 2016.

Methodology: Complete clinical examination and was carried out ultrasound was carried out in all the cases by senior sinologist to conform the cholecystitis. Patients with other associated comorbidities which are associated with C–reactive protein elevation were excluded. Blood sample was taken and send to the diagnostic laboratory to assess the creative protein level. All the data was gathered on self–designed proforma regarding age, gender, clinical features, c reactive protein etc.

Results: Total 120 cases have been selected and divided into two groups as: group A 60 with cholecystitis and group B 60 normal cases. Mean age of group A was 40.32+5.3 years and mean age of group B was 38.12+4.5 years. 45(75%) patients were females. Elevated CRP level was found significantly associated with patients having cholecystitis as compare to normal cases P–value 0.001, in group A 45(75%) patients had raised c reactive protein out of 60, while in normal cases elevated CRP level was found only in 2 cases out of 60. 55(91.66%) patients had right upper quadrant pain, 18(30%) had positive murphys sign, 16(26.33%) had fever while 14(23.33%) had elevated WBC count.

Conclusion: It is concluded that elevated level of serum CRP is significantly associated with cholecystitis patients as compare to normal cases; therefore, elevation of CRP is the good diagnostic tool for acute cholecystitis.

Key Words: C reactive protein, cholecystitis, diagnosis.

Introduction

Cholecystitis prevalently happens as a complexity of gallstone disease and ordinarily creates in patients having symptomatic gallstones history.1 Acute cholecystitis (AC) denotes to a disorder of right upper quadrant pain, temperature elevation, and leukocytosis related with the inflammation gallbladder which is typically identified with gallstone illness.1 Early analysis of cholecystitis permits early treatment and diminish both morbidity and the mortality. The exact analysis of common and in addition atypical instances of acute cholecystitis requires particular indicative criteria. Acute cholecystitis has superior forecast than the acute cholangitis, yet may require quick treatment, particularly in cases having gallbladder torsion and emphysematous, gangrenous, or suppurative cholecystitis.2 Acute calculous cholecystitis is the outcome of gallbladder calculi, a situation which besets > 20 million Americans yearly, and brings about direct expenses of >$6.3 billion.3 Mostly cases with
cholilitis are asymptomatic, and such cases, biliary colic creates in 1 to 4% yearly, and AC inevitably creates in around 20% of these symptomatic cases on the off chance that they are left untreated. Such cases have a tendency to be to some degree more established than those with uncomplicated cholilitis symptomatic. Around 60% of the cases with AC are females. Though AC creates in men more as often as possible as would be normal from the relative commonness of gallstones (around half that in females), and cholecystitis has a tendency to be more extreme in men. Particular analytic criteria are important to correct diagnosis for typical and in addition atypical cases. CRP is not commonly measured in the numerous nations. Be that as it may, in light of the fact that AC is generally connected with elevated CRP level by 3 mg/dl or more. Analysis of AC through elevated CRP levels (equal or more than 3mg/dl), by ultrasound diagnosis recommending AC, has 97% sensitivity, 76% specificity, and PPV 95%. C-reactive protein considered as the best screening diagnostic tool for inflammation of the tissues, as the biomarker of disease action, screen of reflector treatment and as a prescient or prognostic tool of numerous acute and the chronic disease. Cholecystitis if remains undiagnosed, can develop serious complications and very few studies are conducted on this aspect. That is why the purpose of this study was to find out the co-relation of CRP with cholecystitis.

**Methodology**

This was a cross sectional and observational study, and was carried out in general surgery department of LUMHS. Duration was 8 months as December 2015 to May 2016. Total 120 cases have been selected and divided in two groups as: group A 60 with cholecystitis and group B 60 normal cases. Complete clinical examination and was carried out ultrasound was carried out in all the cases by senior sinologist to conform the cholecystitis. All patients those were not confirmed as cholecystitis by ultrasound and having other gall bladder pathologies were excluded from the study. Patients with other associated comorbidities which are associated with C-reactive protein elevation were also excluded. In all the selected cholecystitis patients before undergoing the surgery and normal cases blood sample were taken and send to the diagnostic laboratory to assess the creative protein level. All the data were gathered on self-designed proforma regarding age, gender, clinical features, c reactive protein etc. CRP level was compared in cholecystitis patients and normal cases.

All the data was entered and analyzed in SPSS version 20, mean and standard deviation was calculated for age. Frequency and percentage was calculated for age groups, gender, sign symptoms and form normal and non-elevated CRP level. Chi square test was applied to compare the outcome variables in both groups and p-value less than 0.05 was considered as significant.

**Results**

Total 120 cases have been selected and divided in two groups as: group A 60 with cholecystitis and group B 60 normal cases. Mean age of group A was 40.32±5.3 years and mean age of group B was 38.12±4.5 years. 12(20%) patients were noted with age group of <30 years while 18(30%) patients were from 30-40 years of age group. 45(75%) patients were females while 15(25%) were males in group A and 37(61.66%) were female in group B results. (Table:1)

**Table I: Age and gender distribution of the cases (n= 60)**

<table>
<thead>
<tr>
<th>Age and gender</th>
<th>Groups</th>
<th>Group A n=60</th>
<th>Group B n=60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>P-value</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>12(20.0%)</td>
<td>16(26.66%)</td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>18(30.0%)</td>
<td>21(35.0%)</td>
<td></td>
</tr>
<tr>
<td>&gt;40 years</td>
<td>30(50.0%)</td>
<td>23(38.34%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15(25.0%)</td>
<td>23(38.34%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>45(75.0%)</td>
<td>37(61.66%)</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Mean age group A (cholecystitis) Mean+SD=40.32±5.3 years
Mean age group B (control) Mean+SD=38.12±4.5 years

In this study elevated CRP level was found significantly associated with patients having cholecystitis as compare to normal cases P-value 0.001, in group A 45(75%) patients had raised c reactive protein out of 60, while in normal cases elevated CRP level was found only in 2 cases out of 60. (Table:II)

**Table II: Comparison of CRP level in patients with cholecystitis and controls n=120**

<table>
<thead>
<tr>
<th>CRP level</th>
<th>Groups</th>
<th>Group A (Cholecystitis)</th>
<th>Group B (Control)</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>15</td>
<td>58</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Elevated</td>
<td></td>
<td>45</td>
<td>02</td>
<td>47</td>
<td>0.001</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>60</td>
<td>60</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

In our study, 55(91.66%) patients had right upper quadrant pain, 18(30%) had positive murphys sign,
**Discussion**

Gallbladder diseases are among the main sources for hospitalization for acute abdomen in adults and the most well-known sign for surgeries of the abdomen in elderly.\(^5\) AC is a syndrome which entails the continuation of clinic-pathological states; one end of this range is acute cholecystitis.\(^9\) In this study elevated CRP level was found significantly associated with patients having cholecystitis as compare to normal cases P-value 0.001, in group A 45(75%) patients had raised C reactive protein out of 60, while in normal cases elevated CRP level was found only in 2 cases out of 60. Juvonen T et al\(^8\) reported comparable findings as an elevation in concentrations of CRP was significantly associated with gangrenous GB. There are very few studies mentioned regarding CRP elevation in the cholecystitis.

Cases exhibiting one of the common indications of the inflammation, as well as, Murphy's sign, tenderness and the pain at right upper quadrant, and additionally one of the systemic indications of the inflammation, like as; temperature elevation, elevation of WBC, and increases of the CRP levels, are diagnosed as having AC. CRP levels also is the predisposing factor of the acute cholecystitis severity (more than 10 mg/dL is significantly linked to the tissue necrosis).\(^10\) Some studies reported that CRP cannot play a suitable role in cholecystitis diagnosis, but can be a factor indicating the severity of cholecystitis. On the other hand, some studies reported that CRP concentration equally or >100 mg/L highly linked to the local tissue necrosis.\(^11,12\) In another series reported that CRP concentration in the diagnosis of the sepsis, the threshold concentration was measured to be > 100 mg/L, while cut-off value was not mentioned.\(^13\)

In the study of Gurbulak EK et al\(^14\) reported that cases having grade 2 AC were found with significant elevated CRP than the grade 1 at the CRP concentration 70.65 mg/L or more, whereas cases having a concentration of CRP 198.95 mg/L or more were found significantly associated grade 3 acute cholecystitis. In our study mean age of group A was 40.32±5.3 years and mean age of group B was 38.12±4.5 years and 45(75%) patients were females while 15(25%) were males in group A and 37(61.66%) were female in group B. Similar findings were seen by Siddiqui FG et al\(^15\) showed 193 females and 27 with cholecystitis and mean age is less from our study as 32.3±5.3 years. While Soomro AG et al\(^16\) demonstrated 79 males 442 females and mean age as 47 years, this mean age is comparable with our study findings regarding age. Similarly, in the study of Gelani et al\(^18\) seen also comparable mean age as 42.7 years.

In our study, 55(91.66%) patients had right upper quadrant pain, 18(30%) had positive murphy sign, 16(26.33%) had fever while 14(23.33%) had elevated WBC count. Similar results are seen in the study conducted by Gurbulak EK et al\(^14\) reported that cases having acute cholecystitis usually complaint of the abdominal pain, and mostly at right upper quadrant and epigastrium region. This pain can radiate to the back side or to the right shoulder. Usually, pain of the acute cholecystitis is constant and severe with some associated symptoms of including anorexia and vomiting or nausea along with the history of fatty food intolerance estimated >1 hour before the early onset of the pain. Sustained or cystic duct blockage recurrence may develop complete obstruction by acute cholecystitis. An incident of the constant pain of the right upper quadrant (>6 hours), particularly with fever, should stimulate distrust for AC such as opposed to the assault of the biliary colic. Indications which are not evocative the biliary etiologies including intolerance of fatty foods not in form of pain, pain without nausea, pain for few minutes after a meal, bowel habits irregularity or belching.\(^18\)

**Conclusion**

It is concluded that there elevated level of serum CRP was almost in all cases and was significantly associated with cholecystitis patients as compare to normal cases; therefore elevation of CRP is the good diagnostic tool for acute cholecystitis. More research is required for strong conformation of CRP as a diagnostic tool for inflammation of gall bladder.
References