Micro flora of Bile Aspirates in Symptomatic Cholelithiasis

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Abstract

Background: To determine the frequency of microbial flora and their antibiotic susceptibility patterns in patients with symptomatic cholelithiasis.

Methods: This descriptive study was conducted in Surgical Unit - II, POF Hospital Wah Cantt from June 2007 to June 2008. One hundred cases of cholelithiasis, selected and operated by open cholecystectomy were included in this prospective non-interventional study. Inclusion criteria were patients operated for symptomatic cholelithiasis. Patients with acute cholecystitis, history of jaundice, choledocholithiasis and or dilated common bile duct were excluded from the study. Bile samples were collected from the gallbladder at the time of operation. Age and sex were also noted. The results were recoded on a proforma. Approval was taken from our own ethical committee.

Results: Out of 100, 32 patients had positive bile culture from gallbladder. The most common organism was Escherichia coli (14 patients) followed by Proteus (8), Pseudomonas (4), Staphylococcus aureus (2), Streptococcus (2) and Anaerobes (2). Most of the biliary organisms were highly sensitive to the 3rd generation cephalosporins.

Conclusion: The importance of obtaining cultures of bile at the time of cholecystectomy lies in the fact that appropriate antibiotic can be administered in the event of positive culture to forestall serious complications like gram negative septicaemia.


Introduction

Gall bladder disease has a wide geographic variation, being common in the US where an estimated 15 million people have gall stones and of these 1/5th or 3 million undergo biliary tract operations every year. Infection is still one of the most serious complications of biliary surgery and the close association between organisms in the bile and infection following biliary surgery has been well observed.

It is well known that bactibilia is a common finding in high-risk individuals with complicated gallstone disease, including those with biliary obstruction, age > 70 years, acute cholecystitis, common bile duct stones, cholangitis and non-functioning gallbladders. These factors, together with the use of biliary stents are the major risk factors for postoperative wound infection following biliary surgery. However, there are relatively few data on the prevalence of bactibilia in patients undergoing cholecystectomy for simple cholelithiasis.

Several authors have found the definite correlation between the species of bacteria cultured from bile collected during surgery both from gallbladder and common bile duct and the species cultured from post operative infections. Thus it is important to take bile cultures routinely at the time of operation for antimicrobial prophylaxis to reduce the post operative infection rate. The incidence, types of bacteria involved and their susceptibility to antibiotics need to be accurately predicted on the basis of results from recent bacteriological investigations of bile from accumulated experimental cases. We report here the results of bacteriological investigations conducted on bile aspirated from the gallbladder intra-operatively on 100 patients with cholelithiasis.

Patients and Methods

Bile samples were collected from 100 patients diagnosed as cases of chronic cholecystitis and cholelithiasis when undergoing cholecystectomy. Abdominal pain, varying in intensity from mild to severe, was the major complaint in 97% of the patients. The pain while most frequently located in the right upper quadrant was sometimes noted in the epigastrium. Ultrasound scan was the tool for diagnosis.

During each operation, bile was aspirated with a needle from the gallbladder. Aspirated bile was put in a sterile bottle and immediately sent to laboratory. All samples were cultured aerobically and...
anaerobically. Antibiotic sensitivity testing of isolates was performed using Clinical Laboratory Standard Institution (CLSI methodology) methods.

**Results**

There were 100 patients including 88 females and 12 males. The majority of patients (64%) were in the age group of 40 to 60 years. Thirty two patients had positive bile cultures from gall bladder. The most commonly found micro-organisms was Esch-coli, followed by Proteus, Pseudomonas, Streptococcus and Staphylococcus aureus each as mentioned in Table 1. All of these biliary organisms were found sensitive to third generation cephalosporins (14 cases), aminoglycosides (6 cases) and first generation cephalosporins (2 cases). 7 patients developed wound infection (7%). The cultured micro-organism from the septic wound was different from the micro-organism found in bile culture.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Frequency in Gall Bladder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia-coli</td>
<td>14 (14%)</td>
</tr>
<tr>
<td>Proteus</td>
<td>8 (8%)</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>4(4%)</td>
</tr>
<tr>
<td>Streptococcus</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Staphylococcus. Aureus</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Anaerobes</td>
<td>2(2%)</td>
</tr>
<tr>
<td>Total</td>
<td>32(32%)</td>
</tr>
</tbody>
</table>

**Discussion**

Cholecystitis and cholelithiasis are more common in certain regions of the world and quite rare at other places. In Pakistan; exact figures of overall incidence of cholelithiasis are not available and as a whole are less common. About 15% of patients with gallstones are subjected to surgery for uncomplicated symptomatic gallstones. There is a higher incidence of postoperative morbidity and infectious complications in patients with pathogenic bacteria in gallbladder bile than in patients with no bacterial growth or opportunistic bacteria. The role of bacteria in the pathogenesis of gall stones has been extensively studied. Direct evidence of bacterial presence is not sufficient because of failure to culture bacteria from gallstone. The process of gallstone formation may take a long time and the embedded bacteria may be destroyed. According to our study 32% of the samples from gallbladder bile showed bacterial isolate which is comparable to literature reporting positive culture in 23 to 47 per cent. However there are conflicting reports on the usefulness of bile cultures at the time of surgery and the association of positive bile cultures with post operative wound infection and septic complications. In our study none out of 7 wound infected cases had any correlation with the bile culture organisms.

It may be argued that our administration of prophylactic antibiotics may have adversely biased the positive culture rates of the bile. Antibiotics were administered following induction of anaesthesia in all cases, in accordance with published recommendations. However, as the average cholecystectomy lasted little over 30 min, it is unlikely that a single prophylactic dose of antibiotics would be efficacious against all bacteria present within the bile during this time frame.

Culture of bile from the gallbladder at cholecystectomy for patients with uncomplicated cholelithiasis showed principally Escherichia coli. Others included Pseudomonas spp., Enterococcus faecalis, Streptococcus spp. and Klebsiella spp which is comparable to international literature. Salmonella typhi was not isolated from any of the specimens, yet enteric fever is quite common in Pakistan and different studies observed its presence in bile of cholelithiasis patients.

None of the studies identified one particular antibiotic regimen to be superior to others in the treatment of acute infections in gallbladder bile. Some have reported that third-generation cephalosporins like ceftriaxone and ceftazidime appear to be more sensitive than cefuroxime in antibiotic prophylaxis as also depicted in our study.

**Conclusion**

The importance of obtaining cultures of the bile at the time of cholecystectomy lies in the fact that appropriate antibiotics can be administered in the event of positive culture to forestall serious complications like gram negative septicemia.

**References**


