Microbiological profile and antimicrobial sensitivity pattern in acute bacterial cholangitis.

KOTHARI RAHUL ANIL
Department of Medical Gastroenterology,
PSG INSTITUTE OF MEDICAL SCIENCE & RESEARCH

Abstract:
Introduction - Initial therapy of acute cholecystitis and cholangitis is directed towards general support of the patient, including fluid and electrolyte replacement, correction of metabolic imbalances and antibacterial therapy. Antimicrobial therapy is usually empirical. Initial therapy should cover the Enterobacteriaceae, in particular Escherichia coli. Activity against enterococci is not required since their pathogenicity in biliary tract infections remains unclear. The changing antimicrobial sensitivity pattern of causative organisms poses a therapeutic challenge in treating patients with acute cholangitis. We therefore evaluated the microbial profile and sensitivity pattern to antibiotics in patients with acute bacterial cholangitis. Methods - Data of patients above 18 years of age with acute bacterial cholangitis seen between January 2011 and December 2011 were retrospectively analyzed. Data on clinical features, etiological and microbial profile and therapy, and patient outcomes were analyzed.

Results - Twenty five patients with acute cholangitis were studied. Choledocholithiasis (72.7) and malignancy (19.2) were the main predisposing factors. Bile culture was positive in 23 of 25 patients, and blood culture was positive in 7 patients. Bile cultures were predominantly polymicrobial (45) in contrast to blood cultures (2.2). E. coli was the predominant isolate in blood and bile. No growth was seen on anaerobic bile or blood cultures. There was a resistance of E. coli to third generation cephalosporins.

Conclusions - Changing antimicrobial sensitivity patterns requires a revision of empiric antibiotic therapy policy in cholangitis.

Keyword: microbiological profile, antimicrobial sensitivity, acute bacterial cholangitis

TITLE: Microbiological profile & antimicrobial sensitivity pattern in acute bacterial cholangitis.

AIM: To identify the most common bacteria grown in bile and their antibiotic susceptibility.
**INTRODUCTION:**
Acute cholangitis is a bacterial infection superimposed on an obstructed biliary tree which most commonly occurs due to gallstone disease, but it could also be associated with neoplasm or stricture. The most common symptoms are fever, abdominal pain & jaundice (Charcot’s triad). The main factors in the pathogenesis of acute cholangitis are biliary tract obstruction, elevated intraluminal pressure and infection of bile[1]. A biliary system that is colonized by bacteria but is unobstructed typically does not result in cholangitis[2]. It is believed that biliary obstruction diminishes host antibacterial defenses, causes immune dysfunction, and subsequently increases small bowel bacterial colonization. Although the exact mechanism is unclear, it is believed that bacteria gain access to the biliary tree by retrograde ascent from the duodenum or from portal venous blood. As a result, infection ascends into the hepatic ducts, causing serious infection. Increased biliary pressure pushes the increased biliary pressure pushes the infection into the biliary canaliculi, hepatic veins, and perihepatic lymphatics, leading to bacteremia (25-40%) [3]. Initial therapy includes empiric broad-spectrum antibiotics and prompt decompression of the biliary system. ERCP is the best method to accomplish biliary drainage. A study by Sharma showed equal safety and effectiveness when using a 7 Fr stent or 10 Fr stent for biliary drainage in patients with severe cholangitis[4,5]. The goal of antimicrobial therapy is to resolve the infection. Debate exists as to whether the most effective antibiotics must have high biliary concentrations. When high intrabiliary pressures exist due to biliary obstruction, whether any antibiotic is excreted effectively into the bile is doubtful, thus making biliary levels irrelevant. The choice of antibiotics should be guided by local sensitivity patterns. There is an increase of up to 85% in infectious complications when biliary cultures are not susceptible to the empiric antibiotics.

**REVIEW OF LITERATURE:**
1 A study done by Manoj Kumar Sahu [4] et all on Microbial profile and antibiotic sensitivity pattern in acute cholangitis at CMC Vellore, showed that choledocholithiasis continues to be the most common etiology of acute cholangitis. The antimicrobial susceptibility pattern of causative organismshas changed over time requiring a change in empiric antibiotic policy.
2 A study done by Muhsin Kaya et al[6] in South Korea on the Microbial profile and antibiotic sensitivity pattern in bile cultures from endoscopic retrograde cholangiography patients found out that bile culture was positive for bacterial growth in 46 out of 91 (50.5%) patients. The most frequently encountered organisms were Gram-negative bacteria including Escherichia coli (28.2%), Pseudo-monas (17.3%) and Stenotrophomonas maltophilia (15.2%).

**METHODOLOGY:**
Ø A prospective study was conducted from July 2011 to Dec 2011 at PSG Hospitals, Coimbatore. Ø The diagnosis of cholangitis was made clinically if a patient had fever, jaundice and right upper quadrant abdominal pain along with USG abdomen to document evidence of biliary obstruction.
Ø Bile was aspirated by placing a single-use, 7F, standard sphincterotome catheter (after guide-wire cannulation) into the bile duct before the injection of contrast agent for ERCP. Bile specimens were transported to the microbiology lab.
Ø Bacteria were cultured and identified.
All these records were documented in the case sheets and they were used in our study using a proforma.

Ø Inclusion criteria - Patients with bacterial cholangitis who had undergone ERCP were included in the study.

Ø Exclusion criteria - Patients who were administered antibiotics prior to the procedure were excluded from the study.

**RESULTS & OBSERVATION:**

**Age and Sex distribution**

**Etiology:**

<table>
<thead>
<tr>
<th>ORGANISMS GROWN IN BILE CULTURES</th>
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<tbody>
<tr>
<td><strong>E. coli</strong></td>
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<td>4.22%</td>
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</table>

**Antibiotics Prescribed (A)**

**Antibiotics Prescribed (B)**

25 patients were included in the study and among them, the majority of them were under the 50-60 age group and most of them were females.

Ø The most common etiology was choledocholithiasis (68%), followed by malignancy (24%), and others (8%) which included bilioma & empyema gall bladder.

Ø Among the 25 patients, bile culture was positive in 18 patients (72%), both blood & bile cultures were positive in 7 patients (28%)
The most common organism grown among the bile cultures were E.coli (45%), followed by pseudomonas (22%), Enterococcus fecalis (22%) & Klebsiella (11%). In our setting the isolated organisms were more commonly susceptible to 3rd generation Cephalosporins.

**DISCUSSION:**
Acute bacterial cholangitis is a life-threatening complication of bile duct obstruction requiring emergency care. In our study as in most of the studies, the most common etiological factor was choledocholithiasis. The bile in individuals with normal biliary tract is sterile. Presence of bacterial obstruction leads to bacterial colonization of bile [4,7,8,9]. The most common organisms isolated in bile are Escherichia coli (45%), Enterococcus species (22%) Pseudomonas aeruginosa (22%) and Klebsiella species (11%). Organisms isolated from blood cultures are similar to those found in the bile. In addition, polymicrobial infection is commonly found in bile cultures while blood cultures are mostly monomicrobial. The mainstay of therapy is drainage. ERCP is the best method to accomplish biliary drainage. There is an increase of up to 85% infe cious complications when biliary cultures are not susceptible to the empiric antibiotics. Hence, antibiotic coverage should be guided by local susceptibility patterns.

**CONCLUSION:**
From our study we conclude that the most common bacteria grown in cultures in acute bacterial cholangitis are gram negative bacilli mostly E.coli followed by Enterococci. The choice of antibiotics should be guided by local sensitivity patterns; in our setting the empirical use of 3rd generation cephalosporins was effective against most organisms.

**REFERENCES:**

PROFORMA:
NAME AGE SEX IP NO PRESENTING COMPLAINTS: CLINICAL EXAMINATION: OTHER COMORBIDITIES: DIAGNOSTIC MODALITY LAB RESULTS-IMAGING TECHNIQUES-USG/CT/MRCP BILE CULTURE POSTIVITY- YES/NO IF YES ORGANISM GROWN-ANTIBIOTIC SUSCEPTIBLE TO BLOOD CULTURE POSTIVITY-YES/NO IF YES ORGANISM GROWN-ANTIBIOTIC SUSCEPTIBLE TO