

ORIGINAL RESEARCH

To Assess Bacteriology of the Gallbladder Bile in Normal Subjects

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Abstract

Background: The bile under normal conditions is sterile. Bactibilia is a common finding in individuals at high risk or with complicated cholecystolithiasis, including obstruction of the biliary tract, choledocolithiasis. The present study was conducted to assess bacteriology of the gallbladder bile in normal subjects.

Material & Methods: The present study was conducted among 40 patients. Patients were divided into three groups. The gallbladder was excised; a portion of the fundus (2 cm³) was removed for bacteriologic analysis. The gallbladder bile samples were analyzed and identification of the bacteria was made.

Results: In Group I patients with normal gallbladder showed no bacterial growth either aerobically or anaerobically. In Group II, 80% cultures of gallbladder bile remained negative and 20% cultures were positive. The bacterial flora consisted mainly of enteric bacteria like *Escherichia coli*, *Streptococcus fecalis*, and *Klebsiella*. Mixed flora was seen in only one case. In Group II, gallbladder wall, 30% had positive cultures. Flora was similar as in the bile. In Group III, gallbladder bile, 60% had positive cultures. The same enteric bacteria were present, *Escherichia coli*, *Streptococcus fecalis*, and *Klebsiella*. One patient had mixed flora. No anaerobic bacteria were the Gallbladder found. In Group III, gallbladder wall, 40% had positive cultures.

Conclusion: The present study concluded that patients with normal gallbladder showed no bacterial growth either aerobically or anaerobically. Patients with chronic cholecystitis had 20% cultures were positive; Patients with acute cholecystitis, 60% had positive cultures. The present study was conducted to assess bacteriology of the gallbladder bile in normal subjects.

Keywords: Gallbladder, chronic cholecystitis, acute cholecystitis, Bile.

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Introduction

The presence of a diverse bacterial flora in the bile and walls of the gallbladder in patients with chronic and acute cholecystitis has been well documented in several reports. However, the bacterial content of the normal gallbladder has received little attention, probably due to imprecise definition of the "normal" gallbladder in the literature.¹ Experience tells us that bile under normal conditions is sterile. Similarly, it is well known that bactibilia is a common finding in individuals at high risk or with complicated cholecystolithiasis, including obstruction of the biliary tract, choledocolithiasis, those aged >70 years, acute lithiasic cholecystitis, afunctional gallbladders, and biliary prostheses. However, there is little data regarding the prevalence of bactibilia in

patients who have undergone cholecystectomy due to uncomplicated cholecystolithiasis.² In infected bile, the typical pathogens are the Gram-negative enteric aerobes such as *Escherichia coli*, *Klebsiella* spp. and *Proteus* spp., while *Pseudomonas aeruginosa*, *Bacteroides fragilis* and *Enterococcus faecalis* are less commonly cultured.³ The present study was conducted to assess bacteriology of the gallbladder bile in normal subjects.

Material & Methods

The present study was conducted among 40 patients. Before the commencement of the study ethical clearance was taken from the Ethical Committee of the institute and informed consent was taken from the participants. Patients were divided into two groups.

Group I: Ten patients who underwent operation for gastric or duodenal ulcer or symptomatic hiatal hernia. The definition of a normal gallbladder was based on (1) absence of symptoms related to biliary tract disease (biliary colic, jaundice, and so forth); (2) a normal oral cholecystogram, using iopanic acid (Telepaque) in a weight-related dose, a month prior to the surgical procedure; and (3) normal external appearance of the gallbladder intra operatively, with absence of gallstones on careful palpation. Every patient included in this group met these three criteria. Group II: Ten adult patients with chronic gallstone cholecystitis. The diagnosis in all was made by oral cholecystogram one month prior to operation. Chronic cholecystitis was finally demonstrated by histologic study of the resected specimen. None of the patients received antibiotics before operation. Group III: Ten patients with acute gallstone cholecystitis. No preoperative antibiotics were

employed. None of the patients included in Groups II and III had a previous episode of jaundice or had jaundice at the time of study, and none had exploration of the common bile duct. In all, the macroscopic appearance of the liver was normal. Patients with diabetes or cirrhosis of the liver were not included in this study. Immediately after celiotomy, the gallbladder was subjected to gentle massage to mix the bile thoroughly, and then 2 ml was aspirated with a sterile syringe. Half the sample (1 ml) was used for chemical analysis and 1 ml for bacteriologic study. The interval between the sampling of the bile and the bacteriologic culture was one hour. When the gallbladder was excised, a portion of the fundus (2 cm³) was removed for hacteriologic analysis. The gallbladder bile samples were analyzed and identification of the bacteria was made.

Results

Group	Number	Negative N(%)	Positive N(%)
Bile			
Group I (Control)	10	10(100%)	0(0%)
Group II (Chronic cholecystitis)	10	8(80%)	2(20%)
Group III (Acute cholecystitis)	10	4(%)	6(60%)
Wall			
Group II (Chronic cholecystitis)	10	7(70%)	3(30%)
Group III (Acute Cholecystitis)	10	6(60%)	4(40%)

Table 1: Bacteriologic Findings in the Bile and Wall of the Gallbladder

In Group I patients with normal gallbladder showed no bacterial growth either aerobically or anaerobically. In Group II, 80% cultures of gallbladder bile remained negative and 20% cultures were positive. The bacterial flora consisted mainly of enteric bacteria like Escherichia coli, Streptococcus fecalis, and Klebsiella. Mixed flora was seen in only one case. In Group II, gallbladder wall, 30% had positive cultures. Flora was similar as in the bile. In Group III, gallbladder bile, 60% had positive cultures. The same enteric bacteria were present, Escherichia coli, Streptococcus fecalis, and Klebsiella. One patient had mixed flora. No anaerobic bacteria were the Gallbladder found. In Group III, gallbladder wall, 40% had positive cultures.

Discussion

It is well known that bactibilia is a common finding in patients at high risk, with biliary tract obstruction, biliary tract surgery, of advanced age and with cholangitis.⁴⁻⁶ The Tokyo guidelines recommend that

bile cultures should be taken whenever there is the opportunity, especially in severe cases.⁷In Group I patients with normal gallbladder showed no bacterial growth either aerobically or anaerobically. In Group II, 80% cultures of gallbladder bile remained negative and 20% cultures were positive. The bacterial flora consisted mainly of enteric bacteria like Escherichia coli, Streptococcus fecalis, and Klebsiella. Mixed flora was seen in only one case. In Group II, gallbladder wall, 30% had positive cultures. Flora was similar as in the bile. In Group III, gallbladder bile, 60% had positive cultures. The same enteric bacteria were present, Escherichia coli, Streptococcus fecalis, and Klebsiella. One patient had mixed flora. No anaerobic bacteria were the Gallbladder found. In Group III, gallbladder wall, 40% had positive cultures. A study by Csendes et al. compared the prevalence of bactibilia in normal controls (gastric ulcer surgery) to patients undergoing cholecystectomy for acute and chronic cholecystitis. They found that all controls had sterile

bile while those with acute and chronic cholecystitis had positive cultures in 47% and 30% of cases, respectively.¹Our findings agree with those of Edlund, Mollstedt, and Ouchterlony of sterile bile in the normal gallbladder.⁸Cueto-Ramos R et al found that Bactibilia was identified in 31.95% of the cultures of mild cholecystitis and in 35.71% for moderate ($p < 0.0001$). A total of 125 negative cultures were obtained (68.3) and 58 positive (31.69%) with a prevalence of enterobacteria group (43.10%) and Enterococcus (27.58).⁹

Conclusion

The present study concluded that patients with normal gallbladder showed no bacterial growth either aerobically or anaerobically. Patients with chronic cholecystitis had 20% cultures were positive; Patients with acute cholecystitis, 60% had positive cultures.

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