

# Bile Bacteriology in Patients Undergoing Cholecystectomy

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## ABSTRACT

**Background:** Cholelithiasis is one of the most common surgical and gastroenterological problems worldwide. Association of bile flora with formation of gall stones is rarely studied<sup>5</sup>. Keeping in view the importance of bacteriology of bile, our study is focused on the association of bile micro flora with gall stone disease and its postoperative infective complications.

**Methods:** Study was conducted from August 2011 to December 2013. Bile samples were taken from both open and Lap cholecystectomies and was sent for culture and sensitivity. Data was collected and stores on SPSS 17. Frequencies of different organism were calculated using SPSS 17 and presented in form of tables and figures.

**Results:** Total of 80 bile samples were taken and sent for culture. Among them 49(61.3%) were female and 31(38.8%) were male patients with mean age of 43.98(SD+/-12.004) years. Bile culture of 42(52.5%) did not yield any growth. Pseudomonas species were the commonest organism yielding positive culture in 26(32.5%) cases, followed by E coli 7(8.8%), KlebsHELLa 4(5%) and Enterobacter 1(1.3%). Only 2(2.5%) patients were having fever on first post-operative day and 1(1.3%) patient was having SSI.

**Conclusion:** Association of infective bile with gall stones has been well established in literature, but whether the infected bile is cause of gall stone formation is still debatable. Further studies are warranted to establish and strengthen this concept.

**Keywords:** Bile, biliary infection, cholelithiasis.

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## INTRODUCTION

Cholelithiasis is one of the most common surgical and gastroenterological problems worldwide. It is the problem of both developed and under developed nations. The high prevalence of disease and expensive treatment leads to the great economic burden<sup>1</sup>. Data from American population has shown that around 600,000 cholecystectomies are being performed on 10-15% of adult population annually, costing around \$5 billion<sup>2,3</sup>. Data from Pakistan has shown surgical incidence of 9.03%<sup>4</sup>.

Traditional association of gall stones with cholesterol, food and other factors has been extensively studied. Association of bile flora with formation of gall stones is rarely studied<sup>5</sup>. Normal bile does not have any micro flora in it<sup>6</sup>. So presence of bacteria in patients with cholelithiasis has forced the researchers to think about its role in pathogenesis of gall stones. Association of infected bile with postoperative infective complications has also been observed<sup>7</sup>.

Keeping in view the importance of bacteriology of bile, our study is focused on the association of bile micro flora with gall stone disease and its postoperative complications.

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## PATIENTS AND METHODS

Study was conducted from August 2011 to December 2012 in tertiary care hospital. During this time period Bile samples were taken from 80 Laparoscopic and open cholecystectomies and were sent for culture and sensitivity. Data was collected and recorded in SPSS 17. Frequencies were calculated for categorical variables like sex, types of micro flora and mean was calculated for numerical data like age. Results are presented in form of tables and figures.

## RESULTS

Bile sample was taken by aspiration from gall bladder during Laparoscopic and open cholecystectomy from August 2011 to December 2013. Total of 80 bile samples were taken and sent for culture and sensitivity. Among them 49(61.3%) were female and 31(38.8%) were male patients. Mean age was 43.98(SD+/-12.004) years. There were 63(78.8%) Laparoscopic cholecystectomies and 17(21.3%) were open cholecystectomies. Bile culture of 42(52.5%) did not yield any growth and remaining 38(47.5%) samples yielded growth of micro-organisms. Pseudomonas species were the commonest organism yielding positive culture in 26(32.5%) cases, followed by E coli 7(8.8%), KlebsHELLa 4(5%) and Enterobacter 1(1.3%). As far as the post-operative infective complications are concerned only 2(2.5%) patients were having fever on first post-

operative day and 1(1.3%) patient was having SSI in open cholecystectomy wound. There was no mortality.

Fig. 1

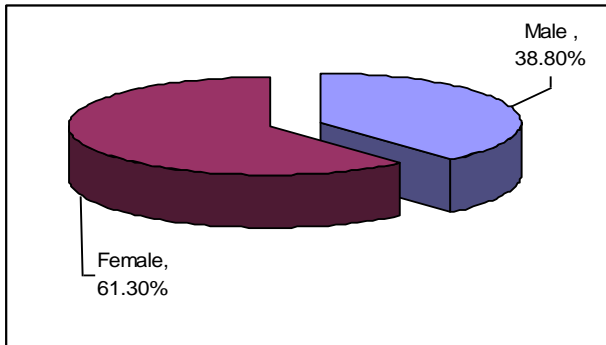


Fig. 2: Laparoscopic and open cholecystectomy ratio

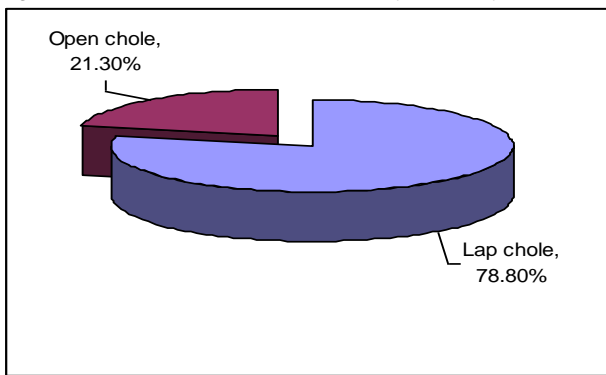


Fig. 3: Frequency of micro flora cultured from bile

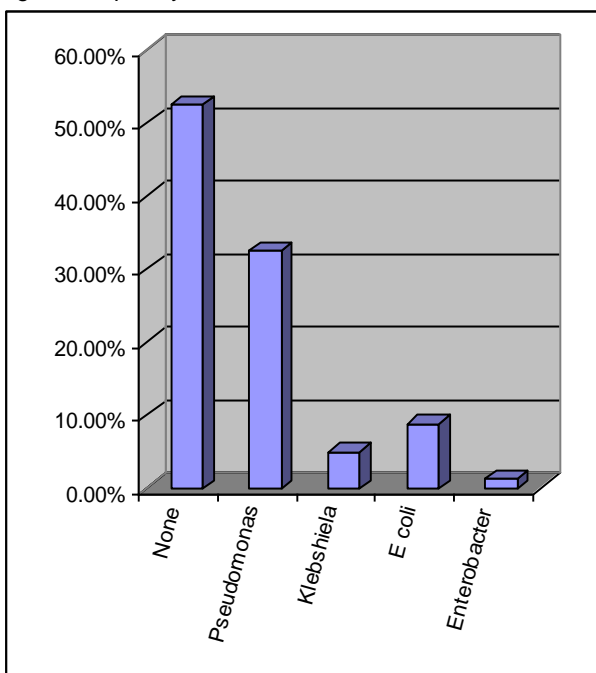


Table 1: Frequency of micro-organism cultured from Bile

	Frequency	%age
none	42	52.5
Pseudomonas	26	32.5
Klebshela	4	5.0
E coli	7	8.8
Enterobacter	1	1.3
Total	80	100.0

**DISCUSSION**

Presence of bacteria in bile and its association with formation of gall stones has also been studied in past. Role of micro flora in pathogenesis of gall stone formation is not well established but its association with gall stones has been reported in literature both nationally and internationally, but according to some authors, presence of bacteria in bile is not sufficient as evidence. Because Gall stone formation is a lengthy and time taking process, bacteria may get killed during this time<sup>5,8</sup>. However there are number of studies which have shown strong association of bacteria with gall stones. Some international studies have shown presence of bacteria in 26 to 42% of cases<sup>9,10,11</sup>. Our study has shown positive bile culture in 47.5% of cases, which is comparable to literature published locally and internationally. One study from Pakistan has shown positive bile culture in 32% of cases with gall stones<sup>12</sup>.

Cultures from bile, taken during cholecystectomy has shown E coli as the commonest organism isolated followed by Pseudomonas spp., Enterococcus faecalis, Streptococcus spp. and Klebsiella spp<sup>13</sup>. Our study has shown Pseudomonas ssp as the most common organism isolated. It was isolated in 32.5% of cases. Other organisms, which are isolated, are E coli 7(8.8%), Klebshella 4(5%) and Enterobacter 1(1.3%). Against our expectations Salmonella spp were not isolated from a single specimen, however Typhoid fever is quite common in our country.

As far as the postoperative infective complications are concerned, there is conflicting evidence in previous literature about the association of positive bile culture with postoperative infective complications. However number of studies has shown relationship of positive bile culture and infective complications like fever, wound infection and sepsis<sup>14,15,16</sup>. In our study only 2 patients suffered from fever in postoperative period and 1 patient suffered SSI as mentioned in results.

**CONCLUSION**

Association of infective bile with gall stones has been well established in literature, but whether the infected bile is cause of gall stone formation is still debatable.

Further studies are warranted to establish and strengthen this concept.

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