International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

Original Research Article.

Assessment of Bacteriological Profile of Bile in Cholelithiasis Patients Undergoing Cholecystectomy

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ABSTRACT

Background: Cholecystectomy is currently a frequently performed operation. The most common reason for a cholecystectomy is gallbladder stones. Hence we planned the present study to assess the bacteriological profile of bile in cholelithiasis patients undergoing laparoscopic cholecystectomy (LC).

Materials & Methods: A total of 100 patients scheduled to undergo LC were included in the present study. Demographic and clinical profile of all the patients was obtained. Complete biochemical and hematological profile of all the patients was obtained. All the patients underwent LC under the hands of skilled surgeons. Bile samples were collected and were sent to the department of microbiology for further analysis.

Results: Micro-organisms were found to be present in 28 percent of the bile samples. Escherichia coli were the most commonly observed micro-organism found to be present in 17 cases. Enterococcus spps. and Staphylococcus aureus were found to be present in 4 and 3 cases respectively. No- significant results were obtained while correlating the presence of micro-organisms with type of stone.

Conclusion: Bile of the cholelithiasis patients undergoing LC often show bactibilia.

Key words: Cholecystectomy, Bile, Cholelithiasis.

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Article History:

Received: 11-12-2018, **Revised:** 06-01-2019, **Accepted:** 24-01-2019

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2019.5.1.029	

INTRODUCTION

Calculus disease of biliary is one of the most common disorders affecting the gastrointestinal tract constituting a major cause of morbidity. The etiopathogenesis of gallstone is multifactorial. Cholecystectomy is currently a frequently performed operation.[1,2] The most common reason for a cholecystectomy is gallbladder stones. However, the presence of gallstones within either the gallbladder or biliary tree is associated with the bacterial colonization of the bile. In patients without gallbladder stone disease, previous biliary intervention is associated with high rates of bacteriobilia.[3-5] Hence we planned the present study to assess the bacteriological profile of bile in cholelithiasis patients undergoing laparoscopic cholecystectomy (LC).

MATERIALS & METHODS

The present study was conducted in the department of microbiology and general surgery of the medical institute and it included assessment of bacteriological profile of bile in cholelithiasis patients undergoing laparoscopic cholecystectomy.

A total of 100 patients scheduled to undergo LC were included in the present study. Demographic and clinical profile of all the patients was obtained. Complete biochemical and hematological profile of all the patients was obtained. All the patients underwent LC under the hands of skilled surgeons. Bile samples were collected and were sent to the department of microbiology for further analysis. All the data were compiled in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

A total of 100 patients were included in the present study. Majority of the patients belonged to the age group of 41 to 50 years. Mean age of the patients of the present study was 45.6 years. 70 percent of the patients of the present study were female while the remaining 30 percent were males. In 75 percent of the cases, gall stones were of mixed type while in 12 and 13 percent of the cases, gall stones were of pigment and cholesterol type.

Micro-organisms were found to be present in 28 percent of the bile samples. Escherichia coli were the most commonly observed micro-organism found to be present in 17 cases. Enterococcus spps. and Staphylococcus aureus were found to be present in 4 and 3 cases respectively. No- significant results were obtained while correlating the presence of micro-organisms with type of stone.

Table 1: Age-wise distribution of subjects

Age group (years)	Frequency
18- 30	4
31- 40	16
41- 50	45
51- 60	25
60 and above	10

Table 2: Gender-wise distribution of patients

Gender	Frequency
Male	30
Female	70

Table 3: Distribution of patients according to type of stones

Type of stone	Frequency
Pigment	12
Cholesterol	13
Mixed or combined	75

Table 4: Distribution of patients according to presence of microorganisms in bile samples

Microorganisms present in bile samples	Frequency
Yes	28
No	72

Table 5: Type of Bacteria Grown in the positive samples

Bacteria	Frequency
Escherichia coli	17
Enterococcus spps.	4
Staphylococcus aureus	3
Salmonella spps.	2
Pseudomonas spp.	2
Total	28

Table 6: Distribution of type of gall stones in patients divided according to presence of microorganisms in bile samples

Type of stone	Microorganisms		P- value
	Present	Absent	
Pigment	4	8	0.55
Cholesterol	4	9	
Mixed or combined	20	55	

DISCUSSION

Gallstones occur when there is an imbalance in the chemical constituents of bile that result in precipitation of one or more of the components. Gallstone disease is often thought to be a major affliction in modern society.[6] Cholecystectomy is ideal for patients who are willing for surgery. This procedure results in a permanent cure for gallstones with no chance of recurrence (in the gall bladder) and requires no long term follow up or medication.[7] Laparoscopic cholecystectomy (LC) has become the accepted gold standard for operative management of gallstone disease worldwide. It is a minimal access approach for the removal of the gall bladder together with its stones.[7,8] Prophylactic antibiotics prevent infections even though they do not sterilize bile rates of bactibilia are not reduced by prophylactic antibiotics that achieve bile levels that exceed the minimum inhibitory concentrations of recovered bacteria.[8]

Mean age of the patients of the present study was 45.6 years. The peak incidence of cholelithiasis in a study by Chuttani et al was between 31 to 60 years.[9] 80 percent of the patients of the present study were females, while the remaining were males. Our results were in correlation with the results obtained by previous authors who have also reported a female predominance has been observed by many workers. It has been suggested that endogenous estrogens and progesterone are responsible for the higher incidence in females, through an effect on bile saturation and smooth muscle function of gall bladder and intestine during the phases of menstrual cycle and pregnancy. This might also be due to decrease in activity of cholesterol reductase and increase in activity of HMG CoA reductase with age, resulting in increased cholesterol secretion and saturation of bile. Female's sex hormones and sedentary habits of most women in India expose them to factors that possibly promote the formation of gall stones.[9-11] Often bile from patients with gallstone is sterile but organisms have been cultured from centre of gallstone. The radiolucent centre of many gallstones may represent mucus plugs originally formed around bacteria. Moynihan's aphorism states that "A gallstone is a tombstone erected to the memory of organism within it". The role of infection is unclear, whether infection causes gallstone or infection is sequelae of gallstone.[12] In Acharya Suri et al.; on gram staining, no organism was found microscopically in the bile of 24 (82.6%) patients. Later on, it was confirmed that such bile was sterile because no growth appeared on culture plates, both aerobic and anaerobic.[13]

Escherichia coli were found to be present in majority of the cases. The reason for E. Coli being the commonest bacteria in bile is because it is the commonest bacteria found in GIT and infection to biliary system comes from the GIT.[14] Significant results were obtained while assessing age-wise distribution of patients according to presence of microorganisms in bile samples. In our study, elderly subjects had significantly higher proportion of positive bile samples. Our results were in concordance with the results obtained by Keighley MRB et al, who reported similar findings. In their study, positive bile cultures are significantly more common in elderly patients than in younger patients.[15] Valazquez-Mendoza JD et al. study; total 80 patients study, 40 patients with bile culture positive and 40 patients with wound culture positive. There was no statistically significant difference when comparing surgical site infection in both groups.[16] In developing countries like ours, repeated, ineffective medication from local practitioners is a common practice especially in chronic diseases like chronic gall bladder diseases and this might probably be a major cause of antibiotic resistance. These patients carrying community acquired strains, on admission to hospital exchange the genetic information with the prevailing nosocomial isolates, resulting in emergence of multidrug resistant strains and polymicrobial infections.[15,16] Hence; antimicrobial activity against potential causative organisms, the severity of the cholecystitis, and the local susceptibility pattern must be taken into consideration when prescribing drugs.

CONCLUSION

Under the light of above obtained results, the authors concluded that bile of the cholelithiasis patients undergoing LC often show bactibilia.

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Source of Support: Nil.

Conflict of Interest: None Declared.

Cite this article as: Pushpendra Kumar, Abhineet Mehrotra. Assessment of Bacteriological Profile of Bile in Cholelithiasis Patients Undergoing Cholecystectomy. Int J Med Res Prof. 2019 Jan; 5(1):136-38. DOI:10.21276/ijmrp.2019.5.1.029