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Original Research Paper

General Surgery

CLINICAL ASPECTS OF BILE CULTURE IN PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

Dr. M. Devagi — MS (General Surgery), DPM., Assistant Professor, Institute Of General Surgery, Madras Medical College, Chennai

Dr. Alice Paulraj — Postgraduate Institute Of General Surgery, Madras Medical College, Chennai

ABSTRACT Laparoscopic cholecystectomy has become an increasingly common procedure with the rise in gallstone illnesses in the recent times. Post operative complications of cholecystectomy include a possibility of bile leakage and surgical site infection. Bacteria in the otherwise sterile bile, or the so called bactibilia is a risk factor for unfavourable postoperative outcomes. This study aimed at investigating biliary microflora, single or multi strain and their antibiotic sensitivity following which an antibiogram can be developed for the same and can be used to reduce morbidities in gallstone diseases. **Methods:** A prospective study was conducted at a tertiary care center, Chennai, involving 60 patients undergoing cholecystectomy. Bile samples were analyzed for microbial isolates and antibiotic sensitivity. **Results:** Among the participants, 53.3% showed no microbial growth. Escherichia coli (15%), Klebsiella (11.7%), and Proteus vulgaris (8.3%) were the most common isolates. High sensitivity to ceftriaxone (88.9%) and PIPTAZ (77.8%) was observed, while amoxicillin showed significant resistance. **Conclusion:** Understanding biliary microflora and resistance patterns aids in tailoring prophylactic antibiotics, reducing complications, and improving outcomes.

KEYWORDS : cholecystectomy, bile culture, gallstone diseases, bactibilia, E.coli

INTRODUCTION:

The very first Laparoscopic cholecystectomy was performed by Phillippe Mouret in the year 1987. McKernan and Saye performed laparoscopic cholecystectomy in the same year in the United States. In India the very first laparoscopic cholecystectomy was performed in Mumbai at JJ Hospital. However in a short period of time Laparoscopic cholecystectomy has established itself as a method of choice for treating a variety of gallbladder disease.

METHODS:

Study Design:

A prospective study conducted from April to September 2022 at government tertiary care center, Chennai.

Patient Selection:

Inclusion Criteria: Patients aged >18 years undergoing cholecystectomy.

Exclusion Criteria: Patients <18 years and pregnant women.

Procedures: Bile samples were collected intraoperatively and subjected to microbial culture and sensitivity testing. Antibiotic susceptibility was analyzed for isolated organisms.

Statistical Analysis:

Sample size was calculated based on a 25% prevalence of positive bile cultures, requiring 60 participants with a precision of 11% at a 95% confidence interval.

RESULTS:

Demographics:

Mean age: 46.85 ± 14.52 years.
Gender Distribution: 76.7% female, 23.3% male.

Clinical Findings:

Common symptoms: Abdominal pain (100%), nausea/vomiting (41.6%), dyspepsia (31.6%), and fever (40%).

Stone Types: Pigment/black stones (61.7%) were more prevalent than cholesterol/yellow stones (38.3%).

Microbial Isolates:

No growth in 53.3% of samples.
Common isolates: E. coli (15%), Klebsiella (11.7%), and Proteus vulgaris (8.3%).

Table 1: Distribution of biliary flora among the study participants (N=60)

Slno	Organism	Frequency	Percent
1	Escherichia coli	9	15
2	Enterococcus	4	6.7
3	Klebsiella	7	11.7
4	No growth	32	53.3
5	Proteus vulgaris	5	8.3
6	Salmonella	2	3.3
7	Shigella	1	1.7

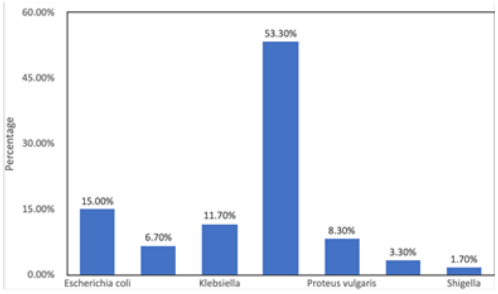

Figure 1: Distribution of biliary flora among the study participants (N=60)

Antibiotic sensitivity patterns:

E. coli: High sensitivity to ceftriaxone (88.9%) and PIPTAZ (77.8%); high resistance to amoxicillin (77.8%).

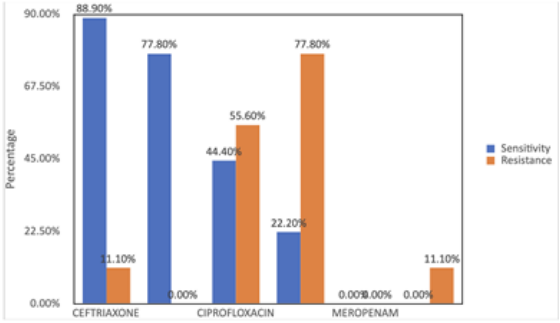

Figure 2: Antibiotic sensitivity to Escherichia coli

Klebsiella: Moderate sensitivity to ceftriaxone (71.4%) and ciprofloxacin (57.1%).

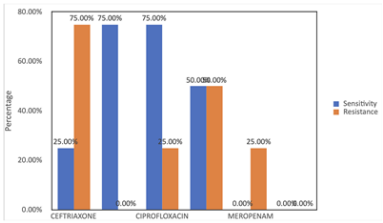

Figure 3: Antibiotic Sensitivity To Enterococcus

Enterococcus showed high sensitivity towards PIPTAZ 75%, 75% towards ciprofloxacin, 50% towards amoxicillin and 25% towards ceftriaxone..

Enterococcus showed high resistance towards ceftriaxone 75%, 50% towards amoxicillin, 25% towards ciprofloxacin and meropenam respectively.

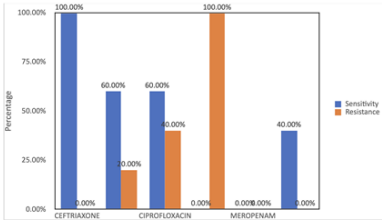

Figure 4: Antibiotic sensitivity to Proteus

Proteus Vulgaris: Fully sensitive to ceftriaxone (100%), moderate resistance to PIPTAZ (20%).

DISCUSSION

This study highlights the presence of bactibilia in gallbladder diseases, with E. coli being the most common isolate. The findings align with previous research indicating higher bacterial prevalence in pigment stones. Antibiotic sensitivity patterns emphasize the efficacy of ceftriaxone and PIPTAZ, underscoring the need for targeted prophylaxis. The resistance to commonly used antibiotics like amoxicillin necessitates revisiting empirical treatment protocols.

Limitations:

The study was limited to a single center with a small sample size, which may affect generalizability.

CONCLUSION:

Escherichia coli was the most frequently isolated bacteria from bile culture followed by Enterococci, Klebsiella, Proteus vulgaris, Salmonella and Shigella. Piperacillin-Tazobactum and Ceftriaxone showed the greatest degree of effectiveness against these pathogens. Hence using these antibiotics as part of the empirical regimen may help reduce gallstone disease associated morbidity.

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