



A microbiological profile of gallstones: cross sectional study from a tertiary hospital in south India.

KEYWORDS

cholelithiasis, microbiology, stone culture.

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ABSTRACT

Cholelithiasis is one of the costliest diseases to treat following GERD. Gallstones are considered to be tomb of dead bacteria. Numerous studies have been done to show the infective nature of the bile but we did this study to analyze the microbiological profile of gall stone. We conducted a cross sectional study of 100 cholelithiasis patients undergoing operative procedure at our department. Microbiological analysis of gallstone was done for all patients under study after obtaining proper ethics committee permission. Results showed that gallstones are no more tombs of dead bacteria, with E coli as most common bacteria isolated.

Introduction:

Pathogenic factors of gallstone disease are likely to be multifactorial and to vary among populations. Most relevant studies have found that the prevalence of gallstones in women ranges from 5% to 20% between the ages of 20 and 55 and from 25% to 30% after the age of 50. The prevalence in men is approximately half that of women of the same age. (1) Many other studies from Chandigarh and New Delhi confirm the high number of gallstone disease in North India (2). A different picture arises from data available from south India. Jayanthi et al (3) reported that mixed and pigment stones were more common than cholesterol stones in Tamilnadu. They found no correlation with demographic features or social customs. The overall prevalence of gallstones in Tamilnadu appears to be lower than in the North. However cholecystectomy once an extremely uncommon surgery in south India has become very frequent reflecting either a real increase in the prevalence of the disease, better diagnosis because of ease of detecting stones by abdominal ultrasound or the availability of Laproscopic cholecystectomy (4). This study was conducted to understand the microbiological factors involved in the formation of gall stones in patients of north Kerala.

METHODOLOGY:

1. Study Design: Cross sectional study.
2. Study Period: JANUARY 2015 to JULY 2016
3. Study Setting: This study was conducted in department of general surgery, Government Medical College, Kozhikode.
4. Study Subject: This study was conducted in patients hailing from north Kerala admitted in the department of general surgery, Government Medical College, Kozhikode.
5. Study Sample Size: A minimum of 100 patients will be studied.
6. Inclusion Criteria: All stable patients without any complications like emphysematous gallbladder, gall bladder perforation diagnosed as Cholelithiasis in CECT/ USG abdomen >13 years willing to participate in the study.
7. Exclusion Criteria: a) Patients not willing for study. b) Seriously ill patients. c) Pts with deranged renal functions {Sr creatinine >1.5}

Data Analysis: Data was analyzed using the SPSS-statistical software. Appropriate statistical test was applied for analysis and interpretation

MICROBIOLOGICAL PROFILING:

After Cholecystectomy the gallbladder was opened and the largest stone was transferred to a culture bottle and transported for stone culture. In the Microbiology Department the whole stone was immersed in 70% ethanol for 10 min for surface sterilization, it was then bisected (taking sterile precautions) and the core would be scooped out for culture, irrespective of stone type and size. Culture was carried out for aerobic Gram-positive and Gram-negative bacteria only, using recommended culture media used at our college

RESULTS AND ANALYSIS

Of the total 100 subjects in the study population, Males were 32 and Females were 68. Percentage of Gallstones with Bacteria – 38.63 %. [table1] Percentage of Sterile Gall Stones – 61.36 %. Percentage of Stones with each Bacterium [table2]. E Coli 13.63 %. Klebsiella 9 %. Proteus 6.8 %. Pseudomonas 4.5 %, Acitnobacter 2.27 %. Staph Aureus 2.27 %. Percentage of Stones with Enteric Bacteria 29.54 %. Percentage of Stones with Non Enteric Bacteria 9%.

Table1: RELATIONSHIP BETWEEN GALLSTONE AND MICROBIOLOGICAL STUDY

SI No	STONES	STERILE	BACTERIA PRESENT	CONTAMINATED
1	CHOLESTE	14	1	5
2	MIXED	39	13	5
3	PIGMENT	1	20	2

The chi-square statistic is 43.1831. The p-value is < 0.00001. The result is significant at p < .05.

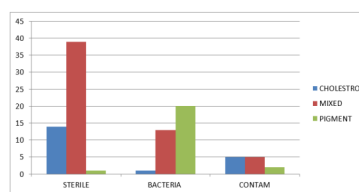


Fig1: RELATIONSHIP BETWEEN GALLSTONE AND MICROBIOLOGICAL STUDY

Table2: RELATIONSHIP BETWEEN TYPE OF GALLSTONE AND BACTERIA ISOLATED

Sl No	STONES	STERILE	E COLI	KLEBSIELLA	PROTEUS	PSEUDOMONAS	ACTINOBACTER	STAPHY	CONTAM
1	CHOLESTE	14	1	0	0	0	0	0	5
2	MIXED	39	2	2	3	4	2	0	5
3	PIGMENT	1	9	6	3	0	0	2	2

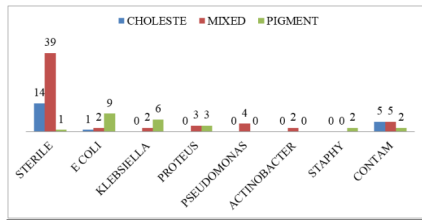


Fig2: MICROBIOLOGICAL PROFILE OF VARIOUS GALLSTONES.

DISCUSSION:

The mechanism of stone formation has been the subject of extensive research for several years, there has been continuous effort by the researchers all over the world to understand the aetiopathogenesis of Gallstone formation by determining the chemical and microbiological nature of gall stone. In our study we evaluated the microbiological profile of gall stone after stone samples derived from elective Cholecystectomy. Out of the stones studied percentage of Gallstones with Bacteria is 38.63%. Percentage of Sterile Gall Stones is 61.36%. The chi-square statistic is 43.1831. The p-value is < 0.00001. The result is significant at p < .05. So there is significance in the bacteria isolated from Gallstones. In our study bacteria most commonly isolated was E.coli. E Coli [13.63 %] Klebsiella [9 %], Proteus [6.8 %] Pseudomonas [4.5 %] Acitinobacter [2.27 %] Staph Aureus [2.27 %]. Percentage of Stones with Enteric Bacteria is 29.54 %. Percentage of Stones with Non Enteric Bacteria 9 %. our results deferred to the findings by P Hazrah et al(5) in which Klebsiella spp was the commonest organism isolated (18%) followed by E. coli (15%), Enterococcus spp. (7.5%) and Enterobacter spp. in 7.5% cases. Although bile culture can also demonstrate the infective potential of bacteria colonising the gallbladder, it yields lower positive culture rates than stone culture in patients with gall stone. [6] The incidence of bile and Gallstone infection varies considerably from area to area in the world and also among different countries in a given area. Contrary to the popular belief that bacteria inside Gallstones are dead, Gallstones from most patients contain live bacteria with the potential to cause infective complications.

CONCLUSION:

There is a significance of bacteria found on microbiological culture of gallstone which explains the potential infective complication contrary to the popular belief that bacteria inside Gallstones are dead.

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