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Prospective Study of Calculous Cholecystitis

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Abstract:
Introduction*: gallstone disease is one of the common problems affecting the gastrointestinal system. factors like obesity,diet, age,ethnic background play arole in development of gallstone diseases. in this study we evaluated the common age group affected by gallstone and common presenting symptoms and biochemical nature of the stone.*
Methodology*: Fifty patients of clearly documented cases of Gallstone diseases admitted in the surgical units of SRM Medical College Hospital and Research Centre between March 2012 to June 2013 constitute the material of this study.*
Results*: The 50 patients of gallstone diseases studied, ranged between 22 and 82 years of age. The mean age being 46.5 years. Right hypochondrial pain with epigastric pain was the presenting complaints in majority (15) cases.11 cases presented with right hypochondrial pain alone and 10 cases had nausea and vomiting along with it. 3(6%) cases had pure cholesterol stones, 27(54%) cases had phosphate containing stones and 20 (40%) had oxalate containing stones.*
Conclusion*: Most of the cases of calculous cholecystitis presented in the fourth decade with females being more commonly affected.pain abdomen is the single most important symptom of gallstone disease.we found that pure cholesterol stones are not common.*
Keywords: *bile,cholesterol, cholecystitis, gallstone,infection*

I. Introduction

Gall stones are one of the most common problems affecting the gastrointestinal tract. There has been a marked rise in the incidence of gallstones in the western countries. The past few decades have shown a surge in the number of Indian population presenting with the same.

Obesity, pregnancy, dietary factors, age, gender and ethnic background are all associated with increased risk of developing gall stone disease. Women are more likely to develop gall stones than men.

1.1 Common Anomalies and Variations

Absent gall bladder – extremely rare, autopsy incidence of 0.03% have been reported.[2]

Double gall bladder, duplication of gall bladder with two separate cavities and two separate cystic ducts has an incidence of approximately 1 in 4000. Pathological process such as cholelithiasis and cholecystitis may involve one organ while the other is spared.[1] Variation in size and shape of gall bladder a, Bilobed gall bladder. b. Funduledivertculum, c. Phrygian cap, d. Hour glass gall bladder.

1.2 Physiology

The gallbladder stores and concentrates hepatic bile in fasting state. The bile is delivered into the duodenum in response to a meal. The absorptive capacity per unit area of the gallbladder mucosa is greatest compared to any other structure in the body. This allows the bile to be concentrated by 5 to 10 fold by absorption of water and electrolytes which changes the bile composition[3,4]. Active NaCl transport by the gallbladder epithelium plays a key role in the concentration of bile. The solute absorption generates an osmotic force which causes passive absorption of water. The concentration of bile afftects the solubility of calcium and cholesterol – the two important components of gallstones. The absorption of calcium is not as efficient as the absorption of sodium or water, this causes an increase in sodium concentration. The concentration of bile increases the tendency for cholesterol nucleation.

Most patients remain asymptomatic throughout their life and may only be detected incidentally on ultrasound and CT scan. Nearly 3% of these individuals become symptomatic (biliary colic) per year. Of which, 3 to 5% of them develop complications per year.

Laparoscopic cholecystectomy has now become the standard of care in treatment of gall stone disease. However, the timing of cholecystectomy, its relevance to complications and use of prophylactic antibiotics has always been a subject of debate.

1.3 Aetio Pathogenesis Of Gallstones

Our knowledge of the aetiopathogenesis of gall stone formation remains incomplete although there has been considerable progress on the mechanism involved during the fast few decades.

1.4 Bile Concentration

Water is a major component of bile. Significant net water absorption occurs during bile transfer through the bile ducts and during prolonged storage in the gallbladder. Asa result, bile water content decreases from 97% weight in the bile ducts to 90% weightin the gallbladder. This threefold to fourfold concentration of bile enhances cholesterolcrystallization and gallstone formation considerably.[5] The accepted current classification recognises three types of gallstones; cholesterol, black pigment and brown pigment stones[7]

1.5 Cholesterol Stones

Pure cholesterol stones account for less than 10% of all stones and occur as single large stones with smooth surfaces, though they contain variable amount of bile pigment and calcium they are always more than 70% cholesterol by weight. Most cholesterol stones are radioluscent and less than 10% are radioopaque. The primary event in formation of cholesterol stones is supersaturation of bile with cholesterol. Cholesterol gallstones do not commonly harbour bacteria and are not associated with infected bile.[3]

1.6 Black Pigment Stones

They account for 25% of stones in the west, but more prevalent in asian countries. They are composed of billirubin polymers without calcium palmitate and varying amounts of cholesterol (3-25%) and a matrix of organic material. They are associated with infections in 20% of patients. They are multiple, small, irregular and dark green to black in colour.Most of them occur secondary to haemolytic disorders, such as hereditary spherocytosis and sickle cell disease, and in those with cirrhosis.

1.7 Brown Pigment Stones

They are less than 1cm in diameter, brownish yellow and soft. They are often associated with infections of the biliary tract. They contain calcium billirubinate calcium palmitate and only small amounts of cholesterol bound in a matrix of organic material.

1.8 Etiology There is increased prevelance of gall stones in females and frequency of gallstones increases with age in both the sexes. Certain risk factors increase the prevelance of gallstones and some induce symptomatic disease in patients. Female sex,Obesity ,Age,Genetic and ethnic factors,Highly refined, fibre depleted, high animal fat diet,Diabetes Mellitus,Ileal disease and resection,Haemolytic states,Infections of biliary tract,Parasitic infections,Cirrhosis,Cystic fibrosis.

Indications[8]:-

Cholelithiasis – with or without symptoms, Acute or chronic cholecystitis – with or without stones, Symptomatic gall bladder polyps, Gall bladder carcinoma, Torsion of gall bladder, Traumatic rupture of gall bladder or cystic duct, Biliary peritonitis – with or without demonstrable perforation, Internal biliary fistula, Gas in the gall bladder, Non functioning gall bladder

Our Aim of this study is to To evaluate the age and sex incidence of gall stone disease, To illustrate various types of clinical presentation in calculous cholecystitis, To study the various modes of management and their results. To study the bacteriology of the bile in calculous gall bladder disease and treatment outcomeand biochemical type of gallstones.

II. Materials And Methods:

Fifty patients of clearly documented cases of Gallstone diseases admitted in the surgical units of SRM Medical College Hospital and Research Centre between March 2014 to June 2015 constitute the material of this study. A detailed History was elicited in all patients and thorough clinical examination was done in them. After relevant pre-operative investigations and pre anesthetic check-up, cases were operated as laparoscopic cholecystectomy. Preoperative antibiotics were given. The operative findings and postoperative complications were recorded and carefully analyzed. The gallstones was sent for biochemical analysis and the gallbladder for histopathological examination. All patients received antibiotics and routine post- operative care.

Patient was properly examined in the post-operative period to note the development in any complication. Antibiotics were given and subsequently changed according to the bile culture and sensitivity report. In the follow up period attention were given to subject to improvement of the patients with regard to symptoms.

III. Results

The overall incidence of Gallstone diseases was 0.7 % of all hospital admissions from March 2012 to June 2013. The 50 patients of gallstone diseases studied ranged between 22 and 82 years of age. The mean age being 46.5 years. The maximum number of cases occurred in the third and fourth decades. Of the 50 cases, 33 (66%) were females, making the female : male ratio 1.94 : 1. Right hypochondrial pain with epigastric pain was the presenting complaints in majority (15) cases.11 cases presented with right hypochondrial pain alone and 10 cases had nausea and vomiting along with it. there was a single case presenting with nausea and vomiting and two cases with epigastric pain alone but, two cases with a combination of both. Howerver , right lumbar pain was the only presenting feature in a patient but it was associated with right hypochondrial pain and nausea and vomiting in 5 cases and one case respectively. One patient presented with right hypochondrial pain, epigastric pain and nausea and vomiting and we had a a single case presenting with right hypochondrial and lumbar pain with nausea and vomiting. Four of our cases had jaundice and one of them was found to have a CBD calculus. Murphys sign was positive in 18 cases. Fever was also a presenting feature in all five cases that were operated as emergency. 11 of our cases were diabetic and 6 of them hypertensive of which 4 of them had both. One patient had bronchial asthma.

3.1 Physical Status Assessment

All patients were assessed preoperatively for comorbidities and its severity. Most of the cases(31, 62%) were assessed as ASA score 1, 13(26%) as ASA 2, 5(10%) as ASA 3 and 1(2%) case as ASA 4.

3.2 Elective Interval

Many cases of acute cholecystitis were managed conservatively in the initial periods and taken up for surgery after intervals of one month to six months. Majority of the cases were taken up for surgery after an interval of about six weeks.

3.3 Management

All the 50 cases were operated. Cholecystectomy alone was done in 46 cases. The other four cases were combined with appendectomy, hysterectomy, ovarian cystectomy and CBD exploration. Of the 50, 48(96%) of them were done laparoscopically and 2(4%) as open procedure. One of the case was converted from a laparoscopic to open procedure due to severe bleeding (conversion rate 2.08%). All the laparoscopic procedures were done through the standard four port, except in 4 cases where an additional port was used.

3.4 Stone Analysis

3(6%) cases had pure cholesterol stones, 27(54%) cases had phosphate containing stones and 20 (40%) had oxalate containing stones.

III. Discussion

N. Teckchandani et al. in a comparable study to our series reported a mean age of incidence of 37.74 years(range 18- 65 years). A wide range (22-85 years) is observed in our series also with an average of 46.5 years. Though several studies have reported a higher incidence of gall stone disease in females, Jaime et al.(2010) in a retrospective review of acute cholecystitis have studied more male population than females in an advanced age group (72.15±17.46 years).[6] Pain was a presenting feature in most cases in our series except in one of the cases who presented as gangrenous cholecystitis presented in a state of drowsiness and had fever, vomiting and hiccups. In a majority of the cases pain was in right hypochondrium and epigastric region(30%). 22 % cases had right hypochondrial pain alone and 4% cases had epigastric pain alone.

As most cases were taken after an elective interval for cholecystectomy, fever was not a presenting feature in the. Never the less , all cases taken up as emergency had fever. Four of our cases had jaundice, three of them were assumed to be reactive jaundice on the basis of its mild nature, biochemical investigations and further imaging. One of the case was found to have a CBD stone and elevated serum alkaline phosphatase levels and needed CBD exploration. 11 of our cases had diabetes mellitus and itself was an indication for surgery in patients with cholelithiasis.

Most cases in this series underwent lap or open cholecystectomy after an elective interval from the time of initial attack. Only 20% of the patients had undergone surgery during the initial period. Patients on longer intervals had become symptomatic and two of them needed readmissions. 48% of the cases who were operated after 3 months gave history of recurrent symptoms. This was of statistical significance(p=0.017).

Though the operative difficulty was more in cases operated in the initial periods, this did not find statistical significance in our study. However, complications rates were lesser in patients who were operated in the initial period and had operative difficulty.

Jaime et al.(2010)concluded that significant proportion of conservative treatment was carried out at the expense of emergency surgery, although in absolute numbers conservative treatment seems to have a higher rate of complications, mortality and hospitalisation time.[6]. C. Skouras et al. after a review of 92 papers on the timing of cholecystectomy concludes that there is strong evidence that early laparoscopic cholecystectomy for acute cholecystitis offers an advantage in the length of hospital stay without increasing the morbidity or mortality.[8]. Our study also concludes that early intervention reduces complications and length of hospital stay.

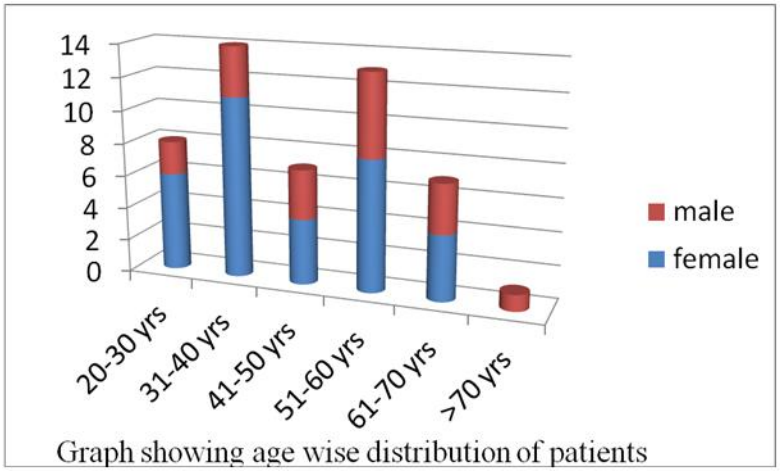
Our study shows a statistical significance between the positive bile culture and post operative complications. D. Fuks et al.(2013) suggests that in all cases, but especially in severe cases, a sample of bile for bacteriologic study should be obtained.[9], Chi square= 12.09, DF=5, P value= 0.03364

The p value is less than 0.05, hence there is a statistical significance between the positive bile culture and post operative complications.

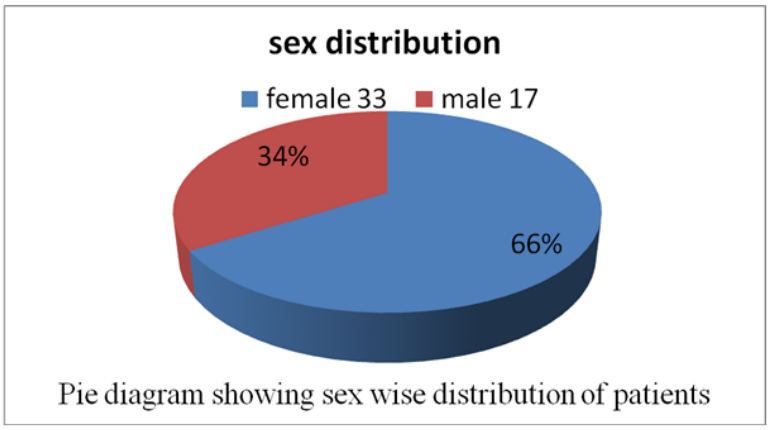
Based on the culture and spectrum of antibiotic sensitivity, 7(14%) cases needed an antibiotic change, where as , 19(38%) cases were continued on the empirical antibiotic. Of the 7 cases which needed an antibiotic change, 6 of them were open cases among which, 5 had operative difficulty. One of the laparoscopic cholecystectomy case was started on oral antibiotic for a stitch abscess.

It was observed that most of the antibiotic changes were needed for open procedures and could be attributed to the post operative complications, operative difficulty or prolonged hospital stay. Nevertheless, D. Fuks et al. reports that continuation of antibiotic treatment after early cholecystectomy does not seem necessary except in severe cases of acute calculouscholecystitis. This is further supported by Jay Narayan Shah et al(2012) who concluded that already low risk of wound infection following laparoscopic cholecystectomy was not significantly reduced further with the routine use of pre operative antibiotic prophylaxis in uncomplicated patients.

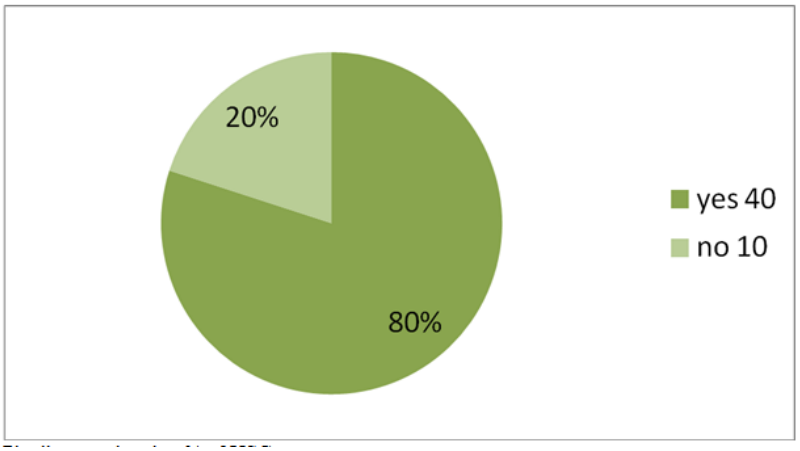
IV. Figures



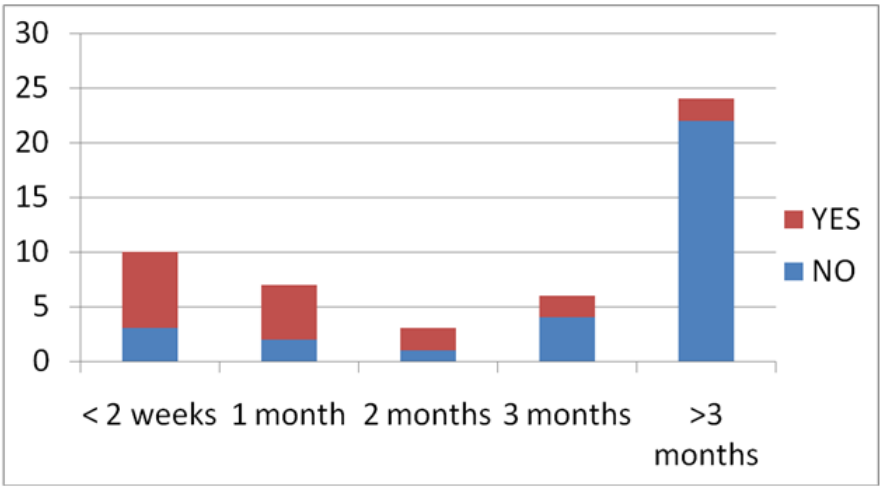
Graph showing age wise distribution of patients



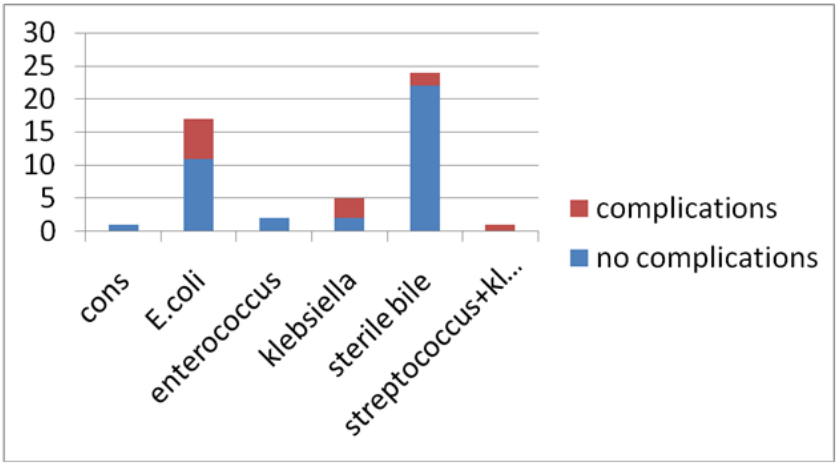
Pie diagram showing sex wise distribution of patients



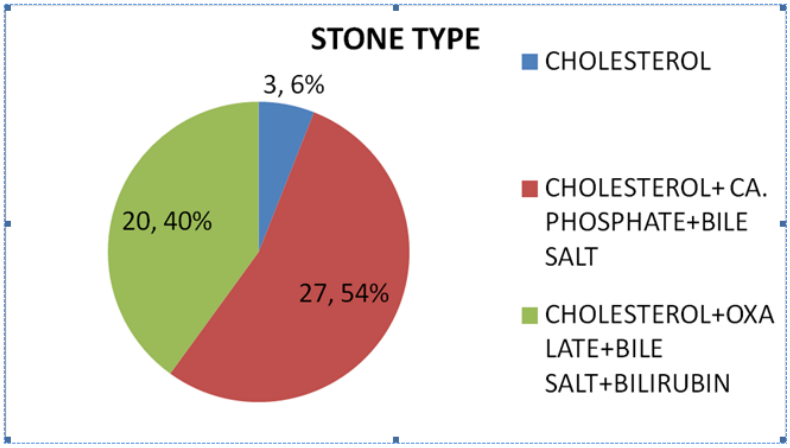
Pie diagram showing % of USG accuracy



Graph showing relation of operative difficulty with elective interval



Positive bile culture and post operative complications



Types of stone and their frequency

IV. Conclusion

In our study we have found that mean age of gallstone disease is 46.5 years and the female to male ratio is 1.94:1.Right hypochondrial and epigastric pain is the most common presenting feature with ultrasonogram alone being adequate to diagnose gallstone disease in 80% of cases. Early surgical intervention in cholecystitis reduces complications and length of hospital stay. Our study suggests the need for routine sampling of bile for culture studies from all cholecystectomy cases. E.Coli is the most common organism grown in bile cultures.Bacterial growth in bile can significantly increase the rate of post-operative complications. pure cholesterol stones are less common. Pure cholesterol stones were not associated with any infected bile.

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