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Choledocholithiasis: Clinical Manifestations and Associated Conditions

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Abstract
Background: *More than 98% of all biliary tract disorders are in some way related to gallstones. Choledocholithiasis refers to the presence of gallstones within the common bile duct (CBD). It represent a clinical problem often involving severe infection, cholangitis and cholestasis. Investigations on the etiology of CBD stones are, however, scarce because of the difficult access to CBD stones and bile. In a clinical series of CBD stones, we studied the symptomatology and associated conditions of CBD stones.*
Methodology: *A total number of 115 patients with CBD stones confirmed by imaging technique who underwent Endoscopic retrograde cholangipancreatography (ERCP) were included in this study and grouped as,*
Group 1- Patients with CBD stones with Gall Bladder (GB) stones.
Group 2- Patients with CBD stones with no stones in GB.
Group 3- Patients with CBD stones in postcholecystectomy state.
Using standard proforma demographic and clinical details were collected. The statistical software package SPSS for Windows version 15 was used to analyse the data.
Results: *Out of 115 patients, 51 were males and 64 were females. Mean age of presentation was 49.91 years. Most common presentation of CBD stones was abdominal pain 60.86% followed by jaundice 38.26%.Charcots triad was seen in 33.04%.*
Most common associated condition was distal CBD stricture (16.5%).
In this study 54% of patients had associated GB stones,22% had isolated CBD stones and 24% had CBD stones in postcholecystectomy state.
Conclusion: *There was no statistically significant difference in clinical presentations, associated features in all the three groups of choledocholithiasis. (P value > 0.238).*
Keywords: *Choledocholithiasis, Common bile duct stones, Endoscopic retrograde cholangiography, Endoscopy and Jaundice.*

Introduction

Choledocholithiasis is defined as the occurrence of stones in the common bile duct (CBD). It is a common clinical problem worldwide. According to the National Health and Nutrition Examination Survey (NHANES III), over 20 million Americans are estimated to have gallbladder disease (defined as the presence of gallstones on transabdominal ultrasound or a history of cholecystectomy) [1]. Among those with gallbladder disease, the exact incidence and prevalence of choledocholithiasis are not known.

It has been estimated that 5 to 20 percent of patients undergoing cholecystectomy for symptomatic gallstones harbor concomitant stones in their CBD [2]. Most cases of choledocholithiasis are secondary to the passage of gallstones from the gallbladder into the common bile duct.

Primary ductal stones formed de novo also add a further small percentage to the overall prevalence. Primary bile duct concretions are much more common in patients of Asian descent compared with those of European descent [3].

Unlike stones in the gallbladder, which usually become clinically evident as relatively benign episodes of recurrent biliary pain, stones in the CBD, when they do cause symptoms, tend to present as life-threatening complications such as cholangitis and acute pancreatitis. Therefore, discovery of choledocholithiasis generally should be followed by some type of intervention to remove the stones. Studies regarding choledocholithiasis in South India are very limited. On this background this study was conducted to analyse various clinical presentations and associated conditions of choledocholithiasis.

Objectives of the study

To study the various clinical presentations and the associated conditions of choledocholithiasis.

Materials and Methods

This was a prospective study conducted from April 2008 to December 2009 in the Medical gastroenterology department of a government hospital. Patients in this study were those with CBD stones found at endoscopic retrograde cholangiopancreatography (ERCP) and where the indication for ERCP was CBD stones seen on imaging studies or when CBD stones were highly suspected based upon clinical presentation and radiographic and laboratory findings.

Inclusion criteria-All patients with CBD stones who underwent ERCP were included in this study. Study population was categorised into three groups.

Group 1- Patients with CBD stones with GB stones.

Group 2- Patients with CBD stones with no stones in GB.

Group 3- Patients with CBD stones in postcholecystectomy state.

Standard proforma was used to collect demographic details and clinical findings after obtaining consent from the study participants.

Statistical Methods: The statistical software package SPSS for Windows version 15 [SPSS Inc, Chicago, III] was used to analyse the data. Means and Standard deviations were used to summarize data for continuous variables whereas percentages were used for categorical variables.

Results

Out of 115 study population, 51 were males and 64 were females. Figure 1 describes the categorisation and composition of study population.

Clinical presentations of three groups of patients are tabulated in Table 1. Abdominal pain was the presenting symptom in 70 [60.86%] patients, jaundice in 44 [38.26%], fever in 42 [36.52%], Charcots triad in 38 [33.04%], biliary pancreatitis in 6 [5.21%] and asymptomatic in 4 [3.47%] patients.

Table2 presents the associated risk factors of patients with choledocholithiasis. Biliary ascariasis was seen in one patient, choledochal cyst type 1 was seen in 2 patients, periampullary diverticulum was seen in 15 patients, distal CBD stricture was seen in 19 patients.

Table-1. Clinical features of patients with choledocholithiasis. (n=115)

S.NO.	Clinical features	Total n=115. (%)	Group – 1 n=62. (%)	Group-2 n=25. (%)	Group – 3 n=28. (%)	p value
1.	Pain	70 (60.86)	40 (64.5)	12 (48)	18 (64.28)	0.329
2.	Jaundice	44 (38.26)	20 (32.25)	11 (44)	14 (50)	0.238
3.	Fever	42 (36.52)	17 (27.41)	13 (52)	12 (42.85)	0.071
4.	Charcots triad	38 (33.04)	18 (29.03)	11 (44)	9 (32.14)	0.403
5.	Pancreatitis	6 (5.21)	3 (4.83)	1 (4)	2 (7.14)	0.859
6.	Asymptomatic	4 (3.47)	2 (3.22)	2 (8)	0	0.280

Table-2. Associated risk factors of patients with choledocholithiasis. (n=115)

S.NO.	Associated risk factors	Total n=115. (%)	Group – 1 n=62. (%)	Group-2 n=25. (%)	Group – 3 n=28. (%)	p value
1.	Distal CBD stricture	19 (16.52)	10 (16.12)	5 (20)	4 (14.28)	0.849
2.	Periampullary diverticulum	15 (13.04)	9 (14.520	4 (16)	2 (7.14)	0.557
3.	Biliary ascariasis	1 (0.87)	0	1 (4)	0	0.163
4.	Choldochal cyst	2 (1.74)	1 (1.61)	1 (4)	0	0.535
5.	Intra Hepatic Stones	3 (2.60)	2 (3.23)	1(4)	0	0.596

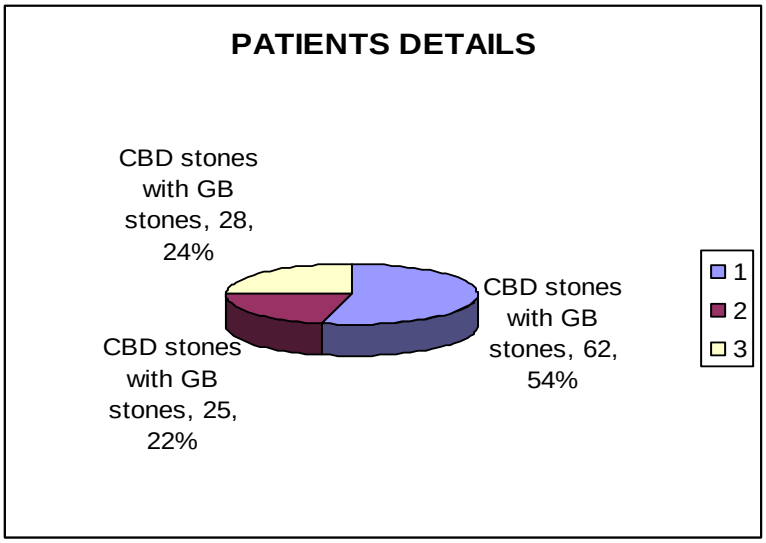

Figure 1. Categorisation and composition of study population

Discussion

In this study, the patients were divided into three groups. Various clinical presentations and associated features in these groups were studied.

Similarly, in a study by Kumar et al, [4] Patients with CBD stones were divided into three groups to analyse clinical and biochemical features of different types of CBD stones.

Rakesh K Tandon et al [5] divided patients with CBD stones into two groups and studied prevalence and type of biliary stones in India.

In this study, CBD stones were slightly more common in females. Mean age of presentation was 49.91 years (range 9 – 76 years). In a study by A. J. Sheen, among patients with CBD stones male-to-female ratio was 1: 3 with a median age of 54 years (range: 17–93) [6].

It has been well demonstrated that the presence of gallstones increases with age. An estimated 20% of adults over 40 years of age and 30% of those over age 70 have biliary calculi. During the reproductive years, the female-to-male ratio is

about 4:1, with the sex discrepancy narrowing in the older population to near equality [7].

The best predictors for the presence of common bile duct stones are cholangitis, jaundice, and direct visualization of stones with ultrasound [8].

Most common presentation of CBD stones in this study was abdominal pain 60.86%, followed by jaundice 38.26%, and fever 36.52%. Charcots triad was seen in 33.04%. Biliary pancreatitis was seen in 5.21%. Patients remain asymptomatic in 3.47%. A J Sheen et al observed jaundice in 7.1%, pancreatitis in 6.3%, Cholangitis in 6.8% [6].

In an another retrospective review of 93 patients with CBD stones with high serum levels of AST or ALT, most common presenting symptom was abdominal pain [9]. CBD stones occur in 8%-20% [10,11,12] of patients suffering from gallstones, Conversely, of patients with ductal stones, 95% also have gallbladder stones [3]. Bile duct stones most commonly have their origin in the common bile duct as primary stones rather than in the gall bladder with secondary descent into the bile duct [13]. In this study 62 patients [54%] had associated GB stones. In, another Indian study 42 patients [56.7%] had GB stones [4].

The association of these two conditions can lead to many severe complications, such as acute biliary pancreatitis, jaundice and cholangitis, transforming the choice of the best strategy for treating a benign issue into a potentially life-threatening problem.

The current management of CBD stones associated with gallstones requires an adequate approach due to the possibility of perioperative morbidity and mortality with severe impact on the quality of life. Many strategies are available at present, mostly involving laparoscopic cholecystectomy as a pivotal step in the entire process. The extremities of the spectrum of treatments are represented by open traditional surgery and full laparoscopic cholecystectomy with CBD clearance [14]. So the first crucial issue for correct management is to reach a good diagnosis in order to reduce unplanned procedures, unnecessary invasive exams and under treatment.

In this study, 25(22%) patients had isolated CBD stones. Out of these 25 patients five had distal CBD stricture, one had biliary ascariasis, one had type 1 choledochal cyst and two had intra hepatic stones and recurrent pyogenic cholangitis. Others could not have any identifiable risk factors for CBD stones.

Total number of patients with CBD stones in postcholecystectomy state were 28 (24%). An analysis of patients with postcholecystectomy abdominal pain, showed 75 per cent had common duct stones at ERCP even in the absence of biochemical and radiological abnormalities [15].

In this study the time interval between cholecystectomy and the diagnosis of CBD stones ranged from <4 weeks to >5 years. CBD stones were diagnosed in 7 (25%) patients in less than 6 months postcholecystectomy state. In a study2.3% of patients were found to have retained CBD stones on ERCP performed within a six month period of their surgery [16].

Six patients were found to have CBD stones in the postcholecystectomy period ranging from 6 months to 1 year, 12 patients in the range of 1-5 years and 3 patients were in >5years of postcholecystectomy state in this study.

Several risk factors, including clinical, biochemical and imaging variables, can help predict the presence of CBD stones [17]. Clinically, increasing age or a history of fever, cholangitis, or pancreatitis are predictors of choledocholithiasis. Elevations of serum bilirubin, aspartate aminotransferase, or alkaline phosphatase are also independent positive predictors. Statistical models incorporating a combination of clinical, laboratory, and imaging variables are more accurate in predicting bile duct stones thanany individual risk factor [3].

Conclusion

There was no statistically significant difference in clinical presentations, associated risk factors in all the three groups of choledocholithiasis.

Association of CBD stones with gallstones and with other risk factors requires accurate diagnosis in order to plan for the appropriate treatment strategies.

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