

Frequency of Common Bile Duct Stones Detected on ERCP in Patients Presenting with Obstructive Jaundice & Having Normal CBD on Ultrasound Abdomen

Frequency of
Common Bile
Duct Stones
Detected on
ERCP

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ABSTRACT

Objective: To determine the frequency of Common stones in Bile Duct detected on Endoscopic Retrograde Cholangiopancreatography (ERCP) in patients presenting with obstructive jaundice & Having Normal CBD on ultrasound Abdomen.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the department of Gastroenterology, Liaquat National Hospital, Karachi from July to December 2016.

Materials and Methods: Total 162 patients with obstructive jaundice of 2-4 weeks duration and normal ultrasound abdomen were included. Before ERCP, patients were clinically evaluated. Outcome variable was the presence of CBD stone in ERCP. Descriptive statistics of the collected data were computed. Stratification was done. For post stratification, Chi-square test was applied. Confidence interval was kept to be 95% and the level of significance was kept to be 5%.

Results: Number of male respondents was 106 and the female respondents were 56. Average age was 35.69±11.30 years. Mean duration of jaundice was 2.94±0.81 weeks. The CBD stone was 32.7% detected in ERCP. Significant association of age was observed with CBD stone in ERCP.

Conclusion: ERCP is the gold-standard for the diagnosis and evaluation of morphological changes in the pancreas. In the common stones of bile duct, for treatment, ERCP is the preferred modality.

Key Words: Common stones of Bile Duct, ERCP, obstructive jaundice, Normal ultrasound Abdomen

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INTRODUCTION

Blockage in any duct in which the bile is flows to gall bladder from liver or to small intestine from gall bladder; obstructive jaundice is caused because of this blockage. This can be because of extrahepatic or intrahepatic reasons. Extrahepatic reasons are divided into the extra-ductal and intra-ductal reasons. Neoplasm, biliary stricture, choledocholithiasis, parasites and primary sclerosing cholangitis cause intra-ductal obstruction.

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Biliary channels` external compression neoplasm, pancreatitis or stones of cystic duct with succeeding distention of gallbladder cause extra-ductal obstruction.¹⁻²

Choledocholithiasis or common stones of bile duct are the public cause of cholangitis and obstructive jaundice³. In about 10 to 20% of patients, choledocholithiasis is developed with the stones of gallbladder, whereas, about 3 to 10% patients underwent cholecystectomy would have common stones of bile duct (CBD)⁴.

Cholangitis can be caused by CBD stones, acute pancreatitis, obstructive jaundice and sepsis. Thus, for the clinical decision making, accurate diagnosis of choledocholithiasis. Endoscopic Retrograde Cholangiopancreatography (ERCP) for therapeutic and diagnostic procedure for CBD stones. Whereas, it is offensive and several complications may be caused i.e. acute pancreatitis (1.3-6.7%), bleeding (0.3-2%), duodenal perforation (0.1-1%), biliary tract infection (0.6-5%).⁵ With cholangiography alone, the sensitivity of ERCP is indicated to be 89-93% when successive sphincterotomy and balloon or basket were utilized as the standard criterion for duct sweeping⁶. Recognized

clinical abnormalities and those which are related to biochemistry and ultrasonography the basis of criteria for ERCP⁷. By the use of these criteria, the studies have shown the stones of bile duct may be identified positively at ERCP in 10-60 percent of cases but even then variations are documented.⁸

This study aims to elucidate the current frequency of CBD stones detection on ERCP among patients with obstructive jaundice. As there is very limited international & local data is available on the frequency of Common stones of Bile Duct detected on ERCP in patients presenting with obstructive jaundice & having Normal CBD on ultrasound Abdomen.

With the present era of cost efficient and time saving medical practice, the study will help in formulating a protocol regarding use of ERCP in investigating obstructive jaundice in our local population and will help in providing shorter hospital stays, reduced medical costs and faster decision making for patient care and also help rationalize the need for ERCP in such patients as other diagnostic modalities like MRCP or Endoscopic Ultra sound are upcoming as alternative to ERCP.

MATERIALS AND METHODS

All the patients of obstructive jaundice as defined in operational definition and fulfilling selection criteria were enrolled in the study. Informed consent was obtained from all the patients after explanation of the study protocol. Before the ERCP, clinical evaluation of patients was conducted by the fellows of gastroenterology at the time of their presentation. ERCP was performed in all patients by gastroenterologist of Department of Gastroenterology, Liaquat National Hospital, Karachi. The equipment used For ERCP would include:

For screening, Fluoroscopy-A TOSHIBA was used and taking hard copy plain films. Duodenoscopy - An Evis Olympus JF type 230 duodenovideoscope. Outcome variable was the presence of CBD stone identified by gastroenterologist during ERCP. All the results were catered in the preapproved Performa. Confounding variables and biases were controlled by strictly following inclusion and exclusion criteria

Data Analysis

The collected data was analyzed in the statistical package for social sciences (SPSS) version 22.0 Descriptive statistics were included mean±standard deviation (SD) of continuous data, like age and duration of obstructive jaundice. Frequencies and percentages were calculated from the categorical data, like gender (male or female), CBD stones (presence or absence). The data were presented in the form of tables and histograms. Effect modifiers were controlled by stratification of age in groups and duration of jaundice by chi square test. Confidence interval was kept to be 95% and the level of significance was kept to be 5%.

RESULTS

Total 162 patients of either gender, age more than 18 years and less than 60 years with obstructive jaundice of 2-4 weeks duration and normal ultrasound abdomen were included in the study to determine the frequency of Common Bile Duct stones detected on ERCP. Descriptive statistics were calculated. Stratification was done to see the effect of modifiers on outcome. Post stratification chi square test was applied considering $p \leq 0.05$ as significant.

Number of male patients was 106 and female patients were 56. In table-1, the frequency distribution is presented.

The mean age of study subjects was 35.69 ± 11.30 years. The distribution of age is presented in Graph-1. The descriptive statistics of age is presented in Table-1.

The mean duration of jaundice was 2.94 ± 0.81 weeks. The descriptive statistics of duration of jaundice is presented in Table-1.

The final outcome of study showed that CBD stone was 32.7% detected in ERCP even have the normal ultrasound. In table 1, the frequency distribution is presented.

Table No. 1: Frequency Distribution of Gender, Cbd Stone in Ercp & Descriptive Statsttiics of Age & Duration of Jaundice (n=162)

Gender	Frequency (n)	% age
Male	106	65.4%
Female	56	34.6%
Total	162	100%
CBD stones in ERCP		
YES	53	32.7%
NO	109	67.3%
TOTAL	162	
Variable	Mean & standard deviation	
Age (years)	35.69 ± 11.30	
Duration of jaundice (weeks)	2.94 ± 0.81	

Table No.2: Frequency and Association of Cbd Stone in Ercp According to Age (years) (n=53)

	CBD IN ERCP			P-value
	YES (n=53)	NO (n=109)	TOTAL	
≤ 35 years (n=88)	5	83	88	0.001
> 35 years (n=74)	48	26	74	
TOTAL	53	109	162	

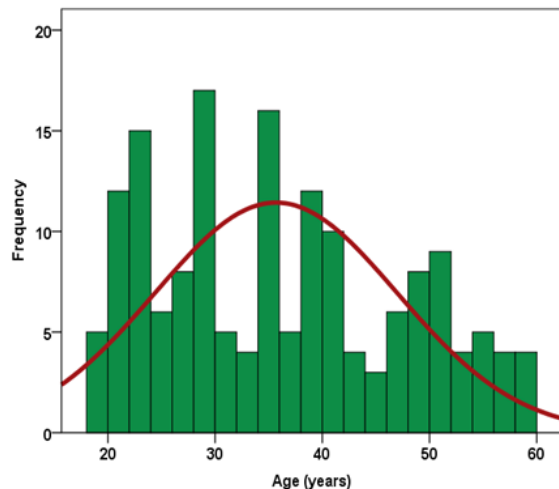
The stratification according to age, duration of jaundice was done to observe the effect of these modifiers on CBD stone in ERCP. Post stratification association of

outcome was observed with modifiers by the use of chi square test.

The results showed that significant association of age with CBD stone in ERCP (P=0.001). No significant association of duration of jaundice was observed with CBD stone in ERCP (P=0.924). The results are presented in detail in Table-2, and Table-3.

Table No.3: Frequency and Association of Cbd Stone in Ercp According to Duration of Jaundice (weeks) (n=53)

	CBD IN ERCP			P-value
	YES (n=53)	NO (n=109)	TOTAL	
2 weeks (n=58)	18	40	58	0.924
3 weeks (n=55)	19	36	55	
4 weeks (n=49)	16	33	49	
TOTAL	53	109	162	



Graph No.1: Histogram Presenting Distribution of Age (years) (n=162)

DISCUSSION

For abdominal surgery, Symptomatic gallstone disease is quite common sign. 500,000 cholecystectomies are estimated to be performed on yearly basis in the United States. Rarely, the gallstones are only the sign for the surgery but it is believed to be carried by 10% of the adult population.

Moreover, the population up to one-third having the age greater than 70 years would have gallstones. Formation of gallstone is a multifactorial process but undoubtedly it is related to the history of the family, pregnancy, diabetes mellitus, obesity, hemolytic disease and significant weight loss⁵.

35% patients with suffering from gallstones would at last become indicative and cholecystectomy would be required¹⁰. Common symptoms for surgical treatment

for cholelithiasis are incorporated with biliary acute cholecystitis, gallstone pancreatitis, colic and various other choledocholithiasis` presentations i.e. cholangitis and bile duct obstruction⁵.

Other related signs e.g. patients of hemolytic anemia experiencing splenectomy with gallstones, patients at high risk before the treatment phase for bone marrow transplant. Cholecystectomy is no more performed routinely for asymptomatic gallstones in those patients who are undergoing aortic surgery or bariatric surgery. Stones of Common bile duct (CBD) may be diagnosed preoperatively, intraoperatively or postoperatively. Those patients who are with signs attributable to cholelithiasis, the standard preoperative workup is carried out for them; the workup is included with the tests of liver function and the ultrasound of abdomen⁵. Combined with the clinical examination and the history, these tests organize the entire workup for many patients. Presence of choledocholithiasis may be suggested by the abnormalities in these tests. The occurrence of Choledocholithiasis may be found in patients with cholecystectomy⁹ or in some series, the occurrence goes to 14.7%.

This is included with various patients deprived of classic preoperative outcomes indicative of choledocholithiasis. It is believed of these asymptomatic patients that around 15% will ultimately become symptomatic and interventional treatment will be required for them⁵.

Since the initiation of timely laparoscopic cholecystectomy, the debate about the utilization of intraoperative bile duct assessment has been continued, with cholangiography or intraoperative ultrasonography primarily. This deliberation endures to some level, with most of the surgeons either selectively or timely conduct the intraoperative evaluation of the bile duct. Only preoperative assessment tools are relied by a smaller subset, this include, endoscopic retrograde cholangiopancreatography (ERCP), magnetic resonance cholangiopancreatography (MRCP) as a accompaniment to tedious investigation of laboratory and imaging. The most prevalent involvement for stones of common bile duct (CBD) is ERCP⁵.

EUS's sensitivity changes from 95%, whereas, specificity is in between 95–98%¹⁰. TUS is significantly less sensitive than EUS in the detection of stones of CBD. EUS sensitivity is comparable to the diagnostic ERCP, whereas, its major benefit is a significantly reduced morbidity in the comparison of ERCP¹¹. Specifically, in the identification of patients it may be beneficial; who would have an advantage from early interference.¹²

Latest authoritative meta-analysis which was incorporated with 67 published controlled trials indicates that MRCP possesses very good sensitivity i.e. 95% and the specificity i.e. 97% for the demonstration of CBDS¹⁴. It was reported by Verma et

al. that there was no any significant differences in EUS and MRCP in the rate of detection of CBDS¹⁵. Lower spatial resolution, potential for claustrophobia, unit availability and inability in the evaluation of patients who are with pacemakers or ferromagnetic implants are counted to be some of the major disadvantages of MRCP in the comparison of ERCP¹³.

CBD stones generally migrate after their origination in the gallbladder. Thus, consequent cholecystectomy would be beneficial in preventing the recurrence of CBD stone. However, in the considerable number of patients with cholecystectomy, recurrence of CBD stone is observed yet. Bile duct stones are considered to be recurrent which are indicated 6 months or greater after endoscopic retrograde cholangiopancreatography (ERCP)¹⁴.

Karki et al¹⁵ have reported 63% patients with CBD stones on ERCP amongst a total of 88 patients with obstructive jaundice. Videhul et al has reported presence of cbd stones in 42% of patients with elevated liver function values²⁰. Siddique et al¹⁶ found CBD stones were the commonest benign cause but they were just 35% of total.

Similarly Verma et al¹⁷ have reported only 29.1% patients with CBD stones with Obstructive jaundice but in this study, only 15 ERCPs were performed. So it is quite clear that there are variable results in the studies regarding prevalence of CBD stones detected by ERCP. A recently published outcome analysis from Nepal shows overall prevalence of 72.81% CBD stones in patients with different presentation and second common presentation was obstructive jaundice.¹⁸ Another Indonesian study conducted on obstructive jaundice patients shows 51% CBD stone prevalence. Magalhães J et al²⁰ has shown prevalence of 66.8% cbd stone on ercp; main predictor of cbd stone in this study was abnormal liver function tests.²⁰ Slott et al has showed less accuracy of ultrasonography in detecting CBD stone.²¹

The rate of recurrence (4% to 24%) CBD stone has been reported. For recurrent bile duct stones, the risk factors after EST were suggested previously for the dilation of common bile duct, Gall Bladder (GB) stone, biliary stricture, periampullary diverticulum, angulation of the CBD, previous open cholecystectomy, and lithotripsy.²²

CONCLUSION

ERCP is counted to be the gold-standard for the diagnosis and the evaluation of morphological changes in the pancreas. In common bile duct stones, ERCP is the preferred modality for treatment.

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