

To Determine the Prediction of Choledocholithiasis by Sex-related Differences in Patients with Symptomatic Gallstones

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ABSTRACT

Introduction: Choledocholithiasis means the presence of stones within the common bile duct (CBD). 10% patients with choledocholithiasis may also develop pancreaticobiliary malignancies. The complications associated with choledocholithiasis was preventing by accurately predicting choledocholithiasis in the preoperative setting. Therefore; the present study was undertaken for determining sex-related differences in the prediction of choledocholithiasis in patients with symptomatic gallstones.

Material and methods: A total of 320 patients were enrolled. Complete history including demographic details of all the patients were obtained. Data related to clinical details and abdominal ultrasound were recorded separately. Two study groups were formed based on gender. Further stratification of each group was done as low risk category, intermediate risk and high risk category on the basis of criteria described previously in the literature. Comparison of incidence rate for choledocholithiasis for each category was done. Haematological and biochemical investigations of all the patients were carried out. The ERCP was performed using endoscopes. All the results were recorded and were analysed by SPSS software 21.

Results: The results showed that there were 61 males and 259 females. Increased bilirubin levels CBD size on US of more than 6mm and abnormal LFT were significant risk factors across males and females. Total bilirubin levels of more than 4 mg/dL was present in 24.59 percent of the males and 18.53 percent of the females. Abnormal LFT levels were present in 57.38 percent of males and 80.69 percent of females. CBD size on US more than 6 mm was seen in 27.87 percent of males and 58.30 percent of females. Also, CBD size on US more than 6 mm and Abnormal LFT were found to be strong predictor for CBD stone incidence.

Conclusion: Female gender is a significant risk factor for occurrence of choledocholithiasis in comparison to males.

Keywords: Choledocholithiasis, Gallstones

INTRODUCTION

Choledocholithiasis is the presence of stones within the common bile duct (CBD). It is estimated that common bile duct stones are present in anywhere from 1-15% of patients with cholelithiasis. The present-day treatment of bile duct stones is endoscopic retrograde cholangiopancreatography (ERCP), or in some cases, laparoscopic cholecystectomy with bile duct exploration.¹ The treatment for choledocholithiasis is the removal of the obstructing stones via endoscopic means. Cholecystectomy in patients with choledocholithiasis remains controversial, but most experts recommend it. Arguments can be made against cholecystectomy in patients who cannot

tolerate surgery well (eg, due to age, medical problems), as long as the organ is asymptomatic. The choledocholithiasis's symptoms differ greatly. The conditions in the patients range from obstructive jaundice to life-threatening conditions, such as ascending cholangitis and pancreatitis.²⁻⁴ In addition, Pancreaticobiliary malignancies were also develop in 10% of patients with choledocholithiasis. Therefore, to prevent complications related to choledocholithiasis, the choledocholithiasis was accurately predicted in the preoperative setting (among patients who are undergoing definitive procedures for gallstone removal)⁵⁻⁷ Therefore; the present study was undertaken for determining sex-related differences in the prediction of choledocholithiasis in patients with symptomatic gallstones.

MATERIAL AND METHODS

The present study was conducted in JLNMC Bhagalpur between May 2017 to April 2020 undertaken for determining sex-related differences in the prediction of choledocholithiasis in patients with symptomatic gallstones. Inclusion criteria for present study included subjects undergoing endoscopic retrograde Cholangiopancreatography (ERCP) for suspected choledocholithiasis; and subjects who underwent intraoperative cholangiography (IOC) at the time of cholecystectomy. A total of 320 patients were enrolled. Complete history including demographic details of all the patients were obtained. The clinical details and data of abdominal ultrasound were recorded separately. Two study groups were formed based on gender. Further stratification of each group was done as low risk category, intermediate risk and high risk category on the basis of criteria described previously in the literature. Comparison of incidence rate for choledocholithiasis for each category was done.

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Risk factors	Male patients (n=61)		Female patients(n=259)		p- value for Risk factors	p- value for CBD stone incidence
	Incidence of Total patients	Incidence of CBD stones	Incidence of Total patients	Incidence of CBD stones		
Cholangitis	10(16.39)	6(60)	30 (11.58)	15 (50)	0.85	0.14
Total bilirubin more than 4 (mg/dL)	20(32.79)	12 (60)	25 (9.65)	19 (76)	0.00*	0.76
Total bilirubin 1.8 to 4 (mg/dL)	15(24.59)	8 (53.33)	48 (18.53)	32 (66.67)	0.44	0.36
Biliary pancreatitis	16(26.23)	7 (43.75)	69 (26.64)	35 (50.72)	0.29	0.17
CBD size on US more than 6 mm	17(27.87)	10 (58.82)	151 (58.30)	63 (41.72)	0.00*	0.04*
Abnormal LFT	35 (57.38)	23 (65.71)	209 (80.69)	105 (50.24)	0.00*	0.01*

LFT: Liver functional test, *: Significant

Table-1: Assessment of risk factors across male and female patients

Haematological and biochemical investigations of all the patients were carried out. The ERCP was performed using endoscopes. All the results were recorded and were analysed by using SPSS software 21. Chi-square test and student t test was used for evaluation of level of significance. P-value of ≤ 0.05 was taken as significant.

RESULTS

In the present study, data of a total of 320 patients was analysed. Among these patients, there were 61 males and 259 females. Increased bilirubin levels CBD size on US of more than 6mm and abnormal LFT were significant risk factors across males and females. Total bilirubin levels of more than 4 mg/dL was present in 24.59 percent of the males and 18.53 percent of the females. Abnormal LFT levels were present in 57.38 percent of males and 80.69 percent of females. CBD size on US more than 6 mm was seen in 27.87 percent of males and 58.30 percent of females. Also, CBD size on US more than 6 mm and Abnormal LFT were found to be strong predictor for CBD stone incidence (table-1).

DISCUSSION

The vast majority of Common bile duct stones (CBDS) form within the gallbladder and then transfer into the common bile duct (CBD), after subsequent gallbladder contractions. Once the stones may reach the duodenum following the bile flow; otherwise, due to the smaller diameter of the distal CBD at the Vater papilla, they may remain in the choledochus. In this last case, gallstones may be fluctuant, thus remaining mostly asymptomatic, or cause a different range of bile flow problems, including complete obstruction and jaundice. Bilostasis may cause bile infection and consequent ascending cholangitis, whereas bile/ pancreatic juice flow problems at the merging of the CBD and the main pancreatic duct (Wirsung) are presumed to potentially trigger the intrapancreatic activation of pancreatic enzymes, thus causing acute biliary pancreatitis. Thus, the clinical presentation of choledocholithiasis may vary widely, as CBDS may be asymptomatic (up to half of cases), or associated with various symptoms and conditions, ranging from colicky pain to potentially life-threatening complications, such as ascending cholangitis or acute pancreatitis.⁵⁻⁷

Patients with gallstones typically go through a preoperative evaluation of clinical data and liver function test. The imaging techniques like magnetic resonance

cholangiopancreatography [MRCP], endoscopic ultrasound [EUS], and endoscopic retrograde cholangiopancreatography [ERCP]) are often used to examine the choledocholithiasis.⁷⁻⁹ Therefore; the present study was undertaken for the prediction of choledocholithiasis by determining sex-related differences in patients with symptomatic gallstones.

In this study, data of a total of 320 patients was analysed. Among these patients, there were 61 males and 259 females. Increased bilirubin levels CBD size on US of more than 6mm and abnormal LFT were significant risk factors across males and females. Total bilirubin levels of more than 4 mg/dL was present in 24.59 percent of the males and 18.53 percent of the females. Chhoda A et al analysed the sex-related differences in predicting choledocholithiasis using current American Society of Gastrointestinal Endoscopy risk criteria. The distribution of incidence of choledocholithiasis, for males it was shown as low probability 3.3%/0%, intermediate probability 56.7%/33.8%), high probability 40%/77.8%; and for females it was shown as, low probability 5.3%/14.3%, intermediate probability 70.2%/39.6%, high probability 24.5%/72.1%. The combined incidence for choledocholithiasis was similar across male and female patients. In this study, there was a significantly higher proportion of females compared to males in the intermediate probability group.¹⁰

Abnormal LFT levels were present in 57.38 percent of males and 80.69 percent of females. CBD size on US more than 6 mm was seen in 27.87 percent of males and 58.30 percent of females. Also, CBD size on US more than 6 mm and Abnormal LFT were found to be strong predictor for CBD stone incidence. Vasavada DP et al evaluated the clinical outcome for CBD stone and evaluate the treatment modality. Out of 30 patients included in the study, 26 had undergone successful ERCP and had successful clearance of CBD which were followed by Laparoscopic cholecystectomy. 2 patients had failed ERCP clearance, out of which 1 patient had undergone re-ERCP with successful clearance of the stone. Appropriate identification of CBD stone size, location, number and CBD diameter associated with features of cholangitis, jaundice and pancreatitis is essential.¹¹ Onken JK et al found the independent risk factors for choledocholithiasis in patients who had undergone cholecystectomy for symptomatic cholelithiasis. The results of 1264 successive patients who had undergone

cholecystectomy were reviewed and 465 of these patients had confirmed presence or absence of choledocholithiasis by cholangiography and/or common bile duct exploration. The accurate approximation of choledocholithiasis risk can be made using maximum preoperative bilirubin, common bile duct diameter, AST, and alkaline phosphatase values.¹²

CONCLUSION

The authors concluded from the study that female gender is a significant risk factor for occurrence of choledocholithiasis in comparison to males. Also, CBD size on US more than 6 mm and Abnormal LFT were found to be strong predictor for CBD stone incidence.

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