

## Study of Obstructive Jaundice in Adult: Association Between Clinical Diagnosis and Operative Findings

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### Abstract

Obstructive jaundice is a condition in which there is blockage of the flow of bile out of the liver. To find out the correlation between clinical diagnosis and operative findings of patients having obstructive jaundice. This prospective observational study was conducted at the Department of Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka from January 2008 to April 2009. Fifty clinically diagnosed obstructive jaundice cases were enrolled in this study. A detailed history was taken and thorough physical examination was done. Also necessary haematological, biochemical, radiological and other special investigations were carried out. In this study, mean age of the patients was 42.9 years and male to female ratio was 1:1.17. The most frequent cause was choledocholithiasis (40%), stricture of CBD (6.0%), retained stone (14.0%), parasitic obstruction (4.0%), carcinoma (30.0%) and other cause (6.0%). Serum bilirubin level was below 10mg/dl in all cases of stricture of CBD. It was above 15mg/dL in cases of carcinoma head of the pancreas. The rise of Serum alkaline phosphates level was up to 3 folds in cases with choledocholithiasis, biliary stricture and pancreatic head malignancy. The average rise in other cases was 1 to 2 folds. Sensitivity and specificity of pre operative clinical diagnosis of

choledocholithiasis, carcinoma and retained stone was 86.4 & 96.4%, 92.3 & 91.9% and 71.4 & 95.3% respectively. Pre operative clinical diagnosis of obstructive jaundice is a good diagnosis tool in diagnosis of causes of obstructive jaundice.

**Keywords:** Obstructive jaundice, choledocholithiasis, biliary stricture.

### INTRODUCTION

Jaundice is a yellowish staining of the skin, sclera, and mucous membranes by bilirubin, a yellow-orange bile pigment. The discoloration typically is detected clinically once the serum bilirubin level rises above 3 mg per dL (51.3  $\mu$ mol per L).<sup>1</sup>

In medical and surgical practice jaundice is a common problem.<sup>1</sup> Though it can often be correctly anticipated clinically but usually biochemical and radiological imaging investigations are required for confirmation. It may be due to a variety of causes and is broadly divided into obstructive (surgical) and non obstructive (medical) categories.<sup>2</sup>

The surgical jaundice can be caused by the obstruction of the bile duct as with gall stones, strictures, malignancy, such as cholangiocarcinoma and carcinoma head of pancreas & periampullary carcinoma. Various rare causes like Choledochal cyst; Caroli's syndrome and primary and metastatic liver tumors have also been reported.<sup>1,2,3</sup>

The symptoms of obstructive jaundice include jaundice with or without pain, dark urine, pruritis, pale stools, weight loss and anorexia.<sup>1,2</sup>

In most cases a firm diagnosis can be achieved by taking careful history and doing thorough physical examination. Liver function test along with some relevant biochemical tests will increase this rate of accuracy. In general, patients with benign disease have less hyperbilirubinemia than those with malignant obstruction.<sup>4</sup> The transaminases (AST & ALT) may abruptly rise many fold above normal and decrease rapidly once the obstruction is relieved.<sup>4</sup>

The radiological investigations available for the diagnosis of obstructive Jaundice can be categorized into noninvasive

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ultrasonography, CT scan & MRCP and invasive ERCP and PTC.<sup>5</sup> Ultrasonography identifies bile duct obstruction accurately though results are largely operator dependent. It is usually the preferred initial investigation because of less expensive, readily available and non invasive.<sup>5,6</sup> Computed tomography (CT) can differentiate between intra- and extra-hepatic obstruction with high accuracy.<sup>5,7</sup> ERCP (Endoscopic Retrograde Cholangiopancreatography) and PTC (Percutaneous transhepatic cholangiography) provide direct visualization of the level of obstruction and ERCP is considered gold standard in evaluation of obstructive jaundice.<sup>5,8,9</sup> But both procedures are invasive.

The aim of this study was to find out the association between clinical diagnosis and operative findings of patients having obstructive jaundice.

### MATERIALS AND METHODS

This was a prospective observational study conducted at the Department of Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka over a period of 16 months from January 2008 to April 2009. A total of fifty clinically diagnosed obstructive jaundice caeses were enrolled in this study. A detailed history was taken and thorough physical examination was done. Subsequently necessary haematological, biochemical, radiological and other special investigations were carried out. Ultrasonography was done in every case, ERCP was done in most of the cases and CT scan was done only in suspected malignant conditions. With all possible means a preoperative diagnosis was established. All patients were catheterized to monitor urinary output during operation and adequate hydration was maintained to keep urinary output >0.5 ml/Kg body wt/hour. Per operative findings were recorded.

### RESULTS

Mean age of the patients was 42.9 years with a systemic error of mean was 1.61 in this study (Table I). Out of all patients 46.0% were male and 54.0% were female (Table II). The most frequent cause was choledocholithiasis, comprising 40% of all cases. Other causes were stricture of CBD (6.0%), retained stone (14.0%), parasitic obstruction (4.0%), carcinoma (30.0%) and other cause (6.0%) (Table III). Percutaneous transhepatic cholangiopancreatography (PTC) was done in 4 cases. Total 27 patients underwent ERCP. Three patients underwent ERCP. Total 16 cases underwent CT scanning (Table IV). Serum bilirubin was understandably raised in every patient but the degree of

elevation was found different in different cases. In all cases of stricture of CBD the level of S. Bilirubin was below 10mg/dl. On the other hand in all cases of carcinoma head of the pancreas the level was above 15mg/dl. Like serum bilirubin serum alkaline phosphates level was also raised in every cases. The rise was up to 3 folds, on average, in cases with choledocholithiasis, biliary stricture and pancreatic head malignancy. The average rise in other cases was 1 to 2 folds. Serum SGPT was raised, not in all cases, mild to moderately (Table V). Sensitivity and specificity of pre operative clinical diagnosis of choledocholithiasis, carcinoma and retain stone was 86.4 & 96.4%, 92.3 & 91.9% and 71.4 & 95.3% respectively (Table VI).

Table I: Distribution of the patients by age and sex (n=50)

Age	Frequency	Percent
Up to 40	18	36.0
41-50	20	40.0
>50	12	24.0

Mean age (±SD) = 42.9±11.61

Table II: Sex distribution of the patients (n=50)

Sex	Frequency	Percent
Male	23	46.0
Female	27	54.0

Table III: Distribution of the patients by clinical diagnosis (n=50)

Clinical diagnosis	Frequency	Percent
Choledocholithiasis	20	40.0
Stricture of CBD	3	6.0
Retained Stone	7	14.0
Parasitic obstruction	2	4.0
Carcinoma head of pancreas	15	30.0
Other	3	6.0

Table- IV: Results of imaging done in study cases (n=50)

Investigations	No. of patients	Percentage
USG	50	100.0
PTC	4	8.0
ERCP	27	54.0
Both PTC and ERCP	3	6.0
CT scan	16	32.0

Table V: Results of liver function test among study population.

Disease	S. Bilirubin	Alk. Phosphates	S. GPT	S. Albumin		Prothrombin time	
				Decreased	Normal	Increased	Normal
Choledocholithiasis	↑	↑↑↑	↑	2	18	5	15
Stricture of CBD	↑	↑↑↑	↑	2	1	2	1
Retained stone	↑	↑↑↑	↑	5	2	4	3
Parasitic obstruction	↑↑↑	↑↑	↑	0	2	1	1
Carcinoma	↑↑	↑↑↑	↑	4	11	5	10
Other	↑↑	↑	↔	1	3	1	3

Legend: For S. Bilirubin ↑= 3-10 mg/dl

↑↑= 11-15 mg/dl

↑↑↑= >15 mg/dl

For Alkaline Phosphates and SGPT No. of arrow indicates No. of times increased.

Table- VI: Per operative findings in study cases

Investigations	Number of patients	Percentage
Choledocholithiasis	20	40.0
Carcinoma	15	30.0
Retain stone	7	14.0
Stricture of CBD	3	6.0
Parasitic obstruction	2	4.0
Other causes	3	6.0

Table VII: Correlation of clinical diagnosis and per operative findings in the diagnosis of choledocholithiasis, carcinoma and retain stone

	TP	FP	FN	TN	Sn	Sp	PPV	NPV	Accuracy
Choledocholithiasis	19	1	3	27	86.4	96.4	95.0	90.0	92.0
Carcinoma	12	3	1	34	92.3	91.9	80.0	97.1	92.0
Retained stone	5	2	2	41	71.4	95.3	71.4	95.3	92.0

## DISCUSSION

This prospective observational study was conducted to find out the correlation between clinical diagnosis and operative findings of patients having obstructive jaundice. In this study, mean age of the study subjects was  $42.9 \pm 11.61$  years which was lower than study subjects of Roy et al.<sup>10</sup> Obstructive jaundice was found more common among the female patients which was consistent with the study of Roy et al.<sup>10</sup> The most frequent cause of obstructive jaundice was

choledocholithiasis (40%) followed by carcinoma (30.0%), retained stone (14.0%), stricture of CBD (6.0%), parasitic obstruction (4.0%), and other cause (6.0%). Most common benign cause was choledocholithiasis.<sup>10-13</sup> Among the malignancy cases, Carcinoma head of pancreas was common.<sup>10,11,13</sup> Carcinoma (Ca) of the head of pancreas was commonest aetiology 37/110 (33.63%) followed by Choledocholithiasis 32/110 (29%).<sup>12</sup> In this study, benign obstructive jaundice was the most common cause of

obstructive jaundice, Bekele et al.<sup>14</sup> reported benign obstructive jaundice as the most common cause of obstructive jaundice.

Sensitivity and specificity of pre operative clinical diagnosis of choledocholithiasis, carcinoma and retain stone was 86.4 & 96.4%, 92.3% & 91.9% and 71.4 & 95.3% respectively. The sensitivities of USG, CT, MRCP and ERCP in the diagnosis of benign disease were 85.3%, 84.6%, 92.3% and 100%, respectively, whereas specificities were 88.4%, 94.2%, 86% and 100%, respectively. Sensitivities for diagnosis of malignant disease were 88.4 %, 94.2 %, 86 % and 100% for USG, CT, MRCP and ERCP respectively whereas specificities were 85.3%, 85%, 92% and 100%.<sup>12</sup>

### CONCLUSIONS

The commonest cause of obstructive jaundices was found choledocholithiasis and Ca-Head of the pancreas. Sensitivity of clinical diagnosis of Carcinoma was found better than clinical diagnosis of choledocholithiasis and retained stone but specificity of clinical diagnosis of carcinoma was found worse than clinical diagnosis of choledocholithiasis and retain stone.

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