

Diagnostic Outcomes and Management of Patients Presenting with Obstructive Jaundice in Surgical Department of Services Hospital Lahore: A Prospective Cross Sectional Study

MUHAMMAD NAEEM AFZAL¹, QAMAR ASHFAQ AHMAD¹, USMAN ALI RAHMAN², SHABBAR HUSSAIN CHANGAZI¹, SAMIULLAH BHATTI¹, MUHAMMAD ZAIN UL ABDIN³

¹Services Institute of Medical Sciences Lahore

²Ghulab Devi Hospital Lahore

³Sahara Medical College Narowal

Correspondence to Dr. Shabbar Hussain Changazi, Email: shabablgh@hotmail.com Cell: 0305-9700111

ABSTRACT

Background: Bile, the major constituent of digestive juice is produced by liver and flows through bile ducts into duodenum. Increase serum bilirubin due to bile outflow obstruction results in obstructive jaundice. Major causes of obstructive jaundice are choledocholithiasis, pancreatic ca cholangiocarcinoma, periampullary ca

Aim: To discover the causative parameters of obstructive/surgical jaundice and the results of management in a local context (setting).

Methods: This was a cross sectional study conducted in Services Hospital Lahore from August 2016 to July 2018. Total of 150 patients were recruited in this study. Patients fulfilling inclusion criteria were assessed through complete history, proper examination, biochemical tests, ultrasonography and radiological and endoscopic tests (CECT of abdomen, MRI/MRCP, ERCP) if indicated. The data was recorded on a predesigned performa and SPSS software version 22 was used for statistically analysis.

Results: In this study, the mean age of patients was 50.23±15.93 years. 56.7% were female and 43.3% were males. In the study, 54.67% had benign disease with choledocholithiasis being the most common cause and 45.33% had malignant disease with pancreatic carcinoma being the leading etiology. 67.33% patients underwent definitive surgery and 32.67% patients were treated with palliative procedures. Different definitive procedures carried out were whipple procedure (20%), cholecystectomy and CBD exploration (23.33%), ERCP followed by cholecystectomy (20%), excision of cyst and hepaticojejunostomy (5.3%), subtotal cholecystectomy (2.7%) patients, ERCP and stent placement (2.7%) and extended cholecystectomy (1.3%). Palliative procedure performed were PTBD (10%), palliative hepaticojejunostomy (6.67%), palliative cholecystojejunostomy (4.67%) and hepaticojejunostomy plus gastrojejunostomy (5.33%). 30 days mortality rate was 13.33%

Conclusion: It is inferred that benign causes of obstructive jaundice are more prevalent than malignant causes and more patients underwent palliative surgeries in malignant etiology of obstructive jaundice.

Keywords: Obstructive jaundice, benign causes, malignant causes, management

INTRODUCTION

Bile, the major constituent of digestive juice is produced by liver. Hepatocytes secrete bile into ductules that flow through complex channels of intrahepatic biliary channels into the duodenum. However part of bile is also stored in gallbladder that is connected to biliary tree through cystic duct. After dietary intake, contraction of gallbladder pours bile into the common bile duct (CBD) through cystic duct. CBD passes into the hepatoduodenal ligament, and then runs within the pancreatic head to open into the duodenum¹. Increased serum bilirubin levels due to any abnormality of liver and biliary tract results in deposition of bilirubin in skin and mucous surfaces giving typical yellow discoloration. This discoloration is termed as jaundice. If jaundice is caused by obstruction to outflow of bile through the ductal system, it is defined as obstructive/surgical jaundice. Obstruction can be intraluminal (stones), intramural (cholangiocarcinoma, stricture) or extramural (pancreatic carcinoma). Major causes of obstructive jaundice are choledocholithiasis, parasitic infestation of CBD, strictures, acute cholangitis, cholangiocarcinoma,

pancreatic carcinoma, periampullary carcinomas and enlarged lymph nodes at porta hepatis due to lymphoma or abdominal tuberculosis². Blockage of right and left hepatic ducts and common bile duct leads to hyperbilirubinemia that consequently piles up in the skin or mucous surfaces causing jaundice (icterus). Due to its increased concentration in blood, conjugated bilirubin begins to appear in urine giving dark color of urine and absent stercobilinogen in stools producing clay colored stools³.

An extensive variety of investigations are existing to diagnose the etiological basis of surgical obstructive jaundice. Preliminary laboratory investigations consist of serum direct and indirect bilirubin levels, alkaline phosphatase, gamma glutamyl transferase, aminotransferases, coagulation profile, and albumin. Ultrasonography is best primary test for obstructive jaundice. The ultrasonographic examination can entail handsome information about etiology like stones in CBD, size of CBD, and hepatic metastases⁴. CECT scan of abdomen is the ideal modality to define the anatomy of obstruction and cause of obstruction in distal biliary tract. It is diagnostic tool in diagnosing pancreatic carcinoma and assesses its resectability. Endoscopic Retrograde Cholangiopancreatography (ERCP) is helpful in locating the obstruction in the lower portion of biliary tract especially

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obstruction due to stones and strictures. In case of stones and strictures, this investigation can be therapeutic as well. It is invasive procedure but has therapeutic benefit as well^{5,6}. Magnetic Resonating Cholangiopancreatography (MRCP) is helpful in proximal obstruction of jaundice. MRCP readily delineate the features and etiology of proximal origin especially cholangiocarcinoma and biliary duct injuries or strictures. It is noninvasive technique and eludes radiation exposure but it is not cost effective⁷.

The prime objective of surgery in obstructive jaundice is to treat/remove the underlying cause of biliary obstruction. Laparoscopic cholecystectomy is the optimal treatment for gallstone disease as it provides early recovery as compared to open cholecystectomy. Choledochal cyst requires excision and hepaticojejunostomy. Resectability of malignant reasons of biliary obstruction depends on the location and extent of the disease. Whipple procedure is the curative surgery for pancreatic or periampullary tumors while endoscopic biliary stenting is considered first-line treatment for unresectable malignant tumors. The prognosis of obstructive jaundice is poor in the developing countries due to unavailability expert medical staff and diagnostic investigations and subsequently proper sequential treatment^{8,9}. The objective of this study was to analyze the different benign and malignant etiologies of obstructive jaundice, different diagnostic modalities available to define these etiologies and different surgical options available in our configuration (setting).

MATERIALS AND METHODS

This was a prospective cross sectional study conducted in Services Hospital Lahore from August 2016 to July 2018. One hundred and fifty patients were recruited in this study. Written informed consent was taken from patients. Ethical committee approval was taken from the institutional review board committee of Services Institute of Medical Sciences before the commencing of the study. Patients with either sex and age 15 years and above and patients admitted to different general surgical wards with preliminary diagnosis of obstructive jaundice were included in the study. Patients with non-obstructive causes of jaundice (viral hepatitis, hemolytic jaundice, sclerosing cholangitis, primary biliary cholangitis and drug induces jaundice) were excluded from the study. All the patients were assessed through complete history, concise and proper examination, biochemical tests that included liver function tests (serum direct and indirect bilirubin levels, alkaline phosphatase, gamma glutamyl transferase, aminotransferases, Aspartate Aminotransferase and Alanine Aminotransferase), complete blood count and renal function tests. Ultrasound of abdomen and pelvis was the initial investigation performed to visualize intra and extra-hepatic biliary channels and abnormality within these channels like stones, growths, enlarged lymph nodes, worms or periampullary masses. Radiological or endoscopic tests such as CECT scan abdomen and pelvis, ERCP and MRI were done as per requirement to reach the definite diagnosis. The patients were evaluated thoroughly in their stay in ward and the data was documented on a pre-tested questionnaire. Preoperative management of obstructive

jaundice include intravenous dextrose (10%) solution 1000ml daily to ensure good glucose load, adequate hydration, vitamin K injections for three days and administration of preoperative dose of antibiotics as per policy of ward. The type of surgery performed, duration of surgery and morbidity and mortality depends on the cause of the obstructive jaundice. Patients were followed throughout their course in hospital. Data analysis was performed using SPSS software version 22. Results were stated as percentages for categorical data and means with standard deviation for continuous data. The categorical data were compared using the Chi-square test while continuous data were analyzed by applying student t-test.

RESULTS

Out of 150 patients recruited for this study, 85(56.7%) patients were of female gender and 65(43.3%) were of male gender. The mean age of patients was 50.23 years with standard deviation of 15.93. Out of 150 patients, 82(54.67%) had benign disease and 68(45.33%) had malignant disease as a cause of obstructive jaundice. The mean age of patients with benign causes was 47.76 ± 17.62 years while that of malignant causes was 53.13 ± 14.53 years with p-value of 0.039. Benign causes of obstructive jaundice were more common in both males (34/65) and females (48/85) as compared to malignant causes with p- value of 0.716. Choledocholithiasis (43.3%) was the most common cause of obstructive jaundice while choledochal cyst (5.3%), benign biliary stricture (2.7%), mirrizi syndrome (2%) and nonspecific fibrosis pancreatic head (1.3%) were less frequent causes of benign obstructive jaundice. Among malignant etiologies of obstructive jaundice, pancreatic carcinoma was the leading cause accounting for 26.7% whereas periampullary carcinoma (4%), duodenal carcinoma (4%), cholangiocarcinoma (4%), gallbladder carcinoma (4%) and malignant mucinous neoplasm (2.7%) were less frequent reasons of malignant type of surgical jaundice (Table.1). This research was approved by the institutional Ethical Committee.

Table.1 Causes of Obstructive jaundice

Causes of Obstructive Jaundice	Frequency (150)	%age
Benign causes	82	54.67
Choledocholithiasis	65	43.3
choledochal cyst	8	5.3
benign biliary stricture	4	2.7
mirrizi syndrome	3	2
nonspecific fibrosis pancreatic head	2	1.3
Malignant causes	68	45.33
Pancreatic carcinoma	40	26.7
periampullary carcinoma	6	4
duodenal carcinoma	6	4
Cholangiocarcinoma	6	4
gallbladder carcinoma	6	4
malignant mucinous neoplasm	4	2.7
Total	150	100

Out of 150 patients, 101 (67.33%) patients underwent definitive surgery and 49(32.67%) patients were treated with palliative procedures. Different definitive procedures carried out were whipple procedure in 20(13.33%) patients,

cholecystectomy and CBD exploration in 35(23.33%) patients, ERCP followed by cholecystectomy in 30(20%) patients, excision of cyst and hepaticojejunostomy in 8(5.3%) patients, subtotal cholecystectomy in 3(2.7%) patients, ERCP and stent placement in 4(2.7%) patients and extended cholecystectomy in 2(1.3%) patients. Palliative procedure performed were percutaneous transhepatic biliary drainage (PTBD) in 15(10%) patients, palliative hepaticojejunostomy in 19(12.67%) patients, palliative cholecystojejunostomy in 7(4.67%) patients and hepaticojejunostomy plus gastrojejunostomy in 8(5.33%) patients.(Table.2) 30 days mortality rate was 13.33% (20 patients).

Table.2 Curative and palliative surgeries performed

Type of Surgery	Frequency (150)	%age
Curative Surgery	101	67.33
Whipple procedure	22	14.67
Cholecystectomy and CBD exploration	35	23.33
ERCP followed by cholecystectomy	30	20
Excision of cyst and hepaticojejunostomy	8	5.3
Subtotal cholecystectomy	3	2.7
ERCP and stent placement	3	2.7
Palliative Treatment	49	32.67
PTBD	15	10
Palliative hepaticojejunostomy	19	12.67
palliative cholecystojejunostomy	7	4.67
Hepaticojejunostomy plus gastrojejunostomy	8	5.33
Total	150	100

DISCUSSION

Obstructive jaundice has multitude of causes and the etiological spectrum extends from benign causes to malignant. Due to its vast etiological spectrum, obstructive jaundice can be a challenging task to diagnose and treatment and as a result, it can cause significant morbidity and mortality of patients. The quest of diagnosing and treating obstructive jaundice becomes more obvious in developing nations like Pakistan where late presentation of the disease coupled with lack of radiological, endoscopic tests (CECT scan abdomen and pelvis, ERCP and MRI) and laparoscopic tests. To elaborate our practices in diagnosing and management of this disease spectrum this study was carried out.

In this study, the mean age of patients was 50.23±15.93 years. The mean age of patients with benign pathology was 47.76±17.62 years while that of malignant etiologies was 53.13 ± 14.53 years indicating that benign diseases of obstructive jaundice were occurring in younger age than malignant causes. Chalya PL et al¹⁰ in his study found that the mean age of patients with benign causes was 42.56 years and that of malignant causes was 58.64 years supporting the results of current study. Similar results were also described by other researchers in their studies^{11,12}.

Out of 150 patients recruited for this study, 85(56.7%) were female and 65(43.3%) were males. Furthermore, benign causes of obstructive jaundice were more prevalent in both males (34/65) and females (47/85) as compared to

malignant causes. These results were in contrary to other studies, which illustrated that the benign and malignant causes of obstructive jaundice were more prevalent in females as compared to males^{10,11,13}.

In this study benign causes of obstructive jaundice overweighed the malignant causes. Bekele et al¹⁴ in their study conducted in Ethiopia also found that benign pathology of obstructive jaundice as the major causative factor of obstructive jaundice. However, other studies negated these results. In these studies, malignant causes of obstructive jaundice were more prevalent than benign causes^{11,12,13,15}. In addition, choledocholithiasis was most frequent cause of benign pathology whereas pancreatic carcinoma was the most popular cause of malignant pathology of surgical jaundice. These results were in concordance with studies conducted by Khurram S et al¹¹, Syed N et al¹³ and Lawal Det al¹⁶. In contrast Sharma MP et al¹⁵ showed that gallbladder carcinoma was the dominating etiology of malignant obstructive jaundice and Absi MA et al¹⁷ in his study elaborated that *Ascaris lumbricoides* infestation was the most prevalent benign pathology of obstructive jaundice.

In present study, all patients with benign obstructive diseases were treated with definitive surgery. Out of 65 patients with choledocholithiasis, 35 patients underwent open cholecystectomy and CBD exploration and 30 patients were treated by ERCP followed by laparoscopic cholecystectomy. Patients diagnosed with choledochocyst were operated with excision of cyst and hepaticojejunostomy. Patients with benign biliary stricture were treated with ERCP and stenting, patients with mirrizis' syndrome underwent subtotal cholecystectomy and whipple procedure was done in patients with nonspecific pancreatic head fibrosis. Most of patients with malignant type of surgical jaundice went through palliative procedures or bypass surgeries. Out 40 patients with pancreatic carcinoma, 16 patients underwent whipple procedure while remaining underwent palliative surgery. Furthermore, most of cases with duodenal carcinoma, gallbladder carcinoma and periampullary carcinoma were treated with palliative procedures. Mohammed et al¹³ also described similar type of treatment in their study. High percentage of palliative procedures in patients with malignant pathology of obstructive jaundice was due to their late presentation for treatment in hospital and the only option left was palliation.

Lastly, in the current study 30 days mortality rate was 13.33% (20 patients). Chalya PL et al¹⁰ in his study calculated the mortality rate of 15.5% that was in close agreement with this study. However Mehrdad et al¹⁸ reported lower mortality rate than above results.

CONCLUSION

It can be inferred from the study that benign causes of obstructive jaundice is more common than malignant. Choledocholithiasis is the most prevalent pathology of benign disease whereas carcinoma of pancreas is the most frequent malignant pathology. In addition, majority of patients with malignant etiology of obstructive jaundice underwent palliative surgeries owing to their late presentation.

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