

A Prospective Study of Evaluation and Management of Obstructive Jaundice in a Tertiary Care Hospital, North Coastal Andhra Pradesh

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ABSTRACT

BACKGROUND

Obstructive jaundice is defined as a condition occurring due to block in pathway between the site of conjugation of bile in liver cells and entry of bile into duodenum through the ampulla. This block may be intrahepatic or extrahepatic in the duct. Evaluation and management of obstructive jaundice is a challenging task to the surgeon owing the varied etiology and wide management option. Common bile duct (CBD) varies in length from 5 to 15 cm with average diameter of 6 mm. CBD can be divided in to four portions: supra duodenal, retro duodenal, intra duodenal and intramural portion. The purpose of this study was to evaluate the pattern of aetiology of obstructive jaundice in these parts and compare the clinical and laboratory presentations with obstructive jaundice between benign and malignant cases.

METHODS

This is a prospective analytical study. Patients with obstructive jaundice who attended the outpatient department of Surgery, GITAM Institute of Medical Sciences and Research, Visakhapatnam over a period of 24 months from November 2017 to October 2019 were admitted and taken up for the study. A total of 60 cases were studied.

RESULTS

Abdominal pain was a presenting symptom in 48 patients (80 %). Ninety five percent of patients of benign and 50 % of patients of malignant aetiology presented with this symptom. P value was found to be statistically significant for this symptom. This means that jaundice with pain in abdomen is more common in benign conditions while malignant conditions cause painless jaundice.

CONCLUSIONS

Malignant obstructive jaundice is most commonly seen in males while benign conditions are more common in females. Benign conditions causing obstructive jaundice is most common under 40 years of age while malignant obstructive jaundice is commonly seen between 50 and 60 years of age.

KEYWORDS

Cholestasis, Extrahepatic, Obstructive Jaundice

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BACKGROUND

Jaundice¹ is yellowish discolouration of sclera and mucous membrane due to deposition of bilirubin. Jaundice is classified as

1. Prehepatic; Hepatic; Post hepatic (obstructive)
2. Intermittent; Continuous; Progressive
3. Painful jaundice; painless jaundice.

Obstructive jaundice is defined as a condition occurring due to block in pathway between the site of conjugation of bile in liver cells and entry of bile into duodenum through the ampulla. This block may be intrahepatic or extrahepatic in the duct. Evaluation and management of obstructive jaundice is a challenging task to the surgeon owing to the varied aetiology and wide management option. Common bile duct varies in length from 5 to 15 cm with average diameter of 6 mm. CBD can be divided into four portions: supraduodenal, retroduodenal, intra duodenal and intramural portion. CBD and pancreatic duct end as ampulla of Vater on the postero medial wall of the second part of duodenum. The extra hepatic bile ducts supplied above from the cystic artery which is a branch of right hepatic artery and from the posterior pancreaticoduodenal artery below.

The lymphatics on the left of gall bladder drain into the cystic node while on the right drain to the node of the anterior border of the epiploic foramen called as the hiatal node which also receives efferents from the cystic node, efferents from extrahepatic bile ducts and right lobe of liver. It in turn drains into the superior pancreaticoduodenal node and then into the celiac and pre-aortic nodes. The hepatocystic triangle or triangle of Calot² is formed by the distal part of the gallbladder and cystic duct to the right, the common hepatic duct to the left and the margin of the right lobe of liver superiorly.

Management of this condition depends on the cause of the obstructive jaundice. After thorough history taking and clinical examination, preliminary blood investigations along with liver function test (LFT) are sent. Serum amylase and lipase are ordered as when required. Imaging of the biliary tract done with CT, MRI / MRCP, PTC, ERCP with ultrasound of the abdomen being the first line imaging modality.³ Periampullary and pancreatic cancers include adenocarcinoma of the head, neck and uncinate process of the pancreas, ampulla, distal CBD and ampullary duodenum. Most tumours originate from the pancreas.^{4,5,6,7}

The hallmark clinical presentation is progressive jaundice, because most pancreatic cancers arise in the right side of the gland resulting in obstructive CBD.⁸ Jaundice is often progressive and associated with dark urine, light stool and pruritus. Locally advanced cancer with invasion onto the celiac plexus typically causes dull vague epigastric pain or discomfort with back pain. In 15 to 20% of patients, recent onset of diabetes is observed. There can be symptoms of pancreatic exocrine insufficiency—malabsorption and steatorrhea. Non-specific symptoms such as nausea, anorexia, weight loss and fatigue are common in many patients of periampullary cancers. Surgical resection of periampullary and pancreatic carcinoma remains the only potentially curative therapy.^{4,5}

Obstructive jaundice is a frequent cause of admission in our Surgical Department of GITAM Institute of Medical Sciences and Research. Hence a detailed study of various causes, clinical manifestations and management of this condition was undertaken and compared with other similar known local patterns of the disease.

Objectives

1. To study the pattern of etiology of obstructive jaundice in these parts
2. To compare the clinical and laboratory presentations with obstructive jaundice between benign and malignant cases.

METHODS

Patients with obstructive jaundice who attended the outpatient department of Surgery, GITAM Institute of Medical Sciences and Research, Visakhapatnam over a period of 24 months from November 2017 to October 2019 were admitted and taken up for the study. A total of 60 cases were studied. A proforma was prepared to record the relevant information pertaining to history, clinical examination, laboratory investigations, imaging studies, treatment and follow up that is required in cases of obstructive jaundice.

After admission, a detailed clinical history was taken and examination done. Relevant investigations were undertaken to determine the diagnosis. Patients were assessed preoperatively for surgical fitness and later subjected to curative or palliative surgery depending on the stage of the disease and general condition of the patient. The resected tissue if any was subjected to histopathological examination. Postoperatively, the patient's condition was assessed and complications if any were documented. Photographic documentation was done wherever possible. Patients were kept on follow up till the completion of the study.

A prospective analytical study consisting of 60 cases of obstructive jaundice was undertaken to investigate the pattern of clinical presentation and laboratory parameters, to study the various aetiological causes of obstructive jaundice and the different modes of treatment adopted. The data was obtained and compared with other similar studies to find out the local pattern of the disease.

Inclusion Criteria

1. Patients more than or equal to 14 years of age
2. Patients proven to have obstructive jaundice by any investigative modality.
3. Patients admitted during the study period of November 2017 to October 2019.

Exclusion Criteria

1. Patients less than 14 years of age.
2. Non obstructive jaundice

Statistical Methods

Chi - square test has been used to find the significance of proportion of symptoms and signs between benign and malignant cases. If P value was < 0.05, the probability was considered to be statistically significant, t - test was used to compare the laboratory investigations in benign and malignant conditions.

RESULTS

Age	Male (N = 12)		Female (N = 28)		Total (N = 40)	
	Count	%	Count	%	Count	%
< 40	4	33.3	14	50.0	18	45.0
41 - 50	5	41.7	10	35.7	15	37.5
51 - 60	2	16.7	3	10.7	5	12.5
61 - 70	1	8.3	1	3.6	2	5.0
> 70	0	0.0	0	0.0	0	0.0

Table 1. Age and Sex Distribution in Benign Cases

Age	Male (N = 13)		Female (N = 7)		Total (N = 20)	
	Count	%	Count	%	Count	%
<40	1	7.7	-	-	1	5.0
41 - 50	2	15.4	1	14.3	3	15.0
51 - 60	5	38.5	3	42.9	8	40.0
61 - 70	3	23.1	2	28.6	5	25.0
> 70	2	15.4	1	14.3	2	10.0

Table 2. Age and Sex Distribution in Malignant Cases

The above table (1 and 2) shows analysis of age and sex distribution in benign and malignant cases. Mean age in benign patients was 40.9 years, ranging from 16 - 65 years where as in malignant patients, the mean age was 55.2 years ranging from 39 - 73 years. There were no benign cases in above 70 years age group while in below 40 years age group very few malignant cases were recorded.

benign and malignant causes of obstructive jaundice. Jaundice was present in 52 patients (86.6 %). 90 % of patients with malignant and 85 % of patients with benign aetiology presented with this symptom.

Pain in abdomen was present in 48 patients (80 %). 95 % of patients of benign and 50 % of patients of malignant aetiology presented with this symptom. P value was found to be statistically significant for this symptom. This means that jaundice with pain in abdomen is more common in benign conditions while malignant conditions cause painless jaundice.

Pruritus was a symptom in 36 patients (60 %). 70 % of patients of benign and 40 % of patients of malignant aetiology presented with this symptom. P value was found to be significant statistically which means that pruritus is more common in benign than malignant in obstructive jaundice. High colored urine was present in 32 patient (53.3 %) clay colored stools were seen in 27 patients (45 %) of which 20 were due to benign disease and 7 were due to malignant cause. Nausea/vomiting was present in 26 patients (43.33 %) Icterus was present in all patients who were diagnosed to have obstructive jaundice, hence no statistical difference between the 2 groups was observed. Pallor was present in a total of 18 patients (30 %). 50 % of malignant cases and 20 % of benign cases had pallor. Since the P value was significant, it can be inferred that pallor was more common in malignant than benign conditions of obstructive jaundice. Palpable lump was present in 9 cases in total. P value was found to be statistically significant. This means that palpable lump was a more common finding in malignant obstructive jaundice.

Lab Parameters	Benign		Malignant		P - Value
	Mean	SD	Mean	SD	
Haemoglobin	11.1	1.8	10.1	1.5	0.07
Total bilirubin	7.1	4.8	13.2	6.4	0.04*
Direct bilirubin	4.8	3.4	9.6	5.4	0.032*
Alkaline phosphates	360	159.0	680	270.0	0.001*

*. Significant

Mean haemoglobin in benign conditions was 11.1 g/dl and 10.1 g/dl in malignant cases and there was no significant difference. Mean total bilirubin in benign cases was 7.1 mg/dl and 13.2 mg/dl in malignancy and direct bilirubin was 4.8 mg/dl and 9.6 mg/dl respectively.

Both these results were statistically significant when benign and malignant conditions are compared. Mean alkaline phosphatase was 360 IU/L in benign conditions and 680 IU/L in malignant conditions and highly significant (P < 0.01).

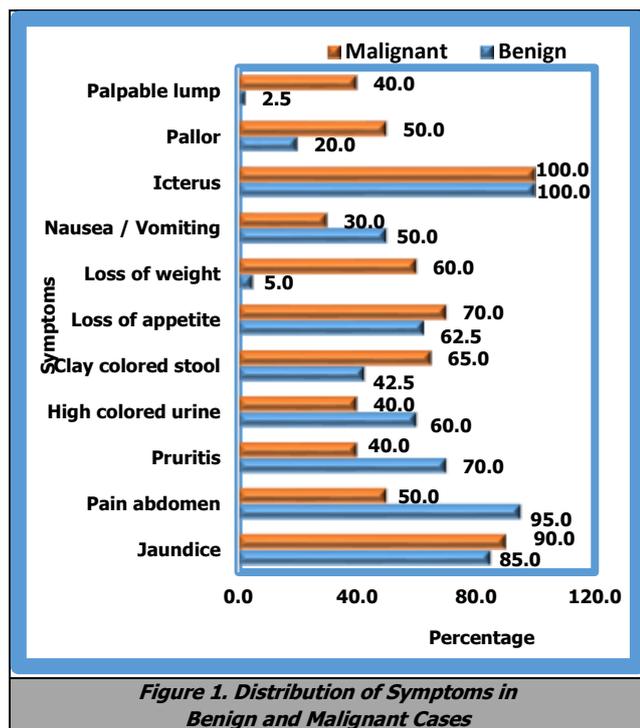


Figure 1. Distribution of Symptoms in Benign and Malignant Cases

Figure 1 shows percentage distribution of presenting symptoms and signs of benign and malignant cause of obstructive jaundice. The above analysis shows the comparison of presenting symptoms and signs between

Diagnosis	Frequency	Percentage
Cholechololithiasis	26	65.0
CBD stricture	6	15.0
Cholechal cyst	5	12.5
Mirizzi's syndrome	3	7.5

Table 4. Conditions of Obstructive Jaundice in Benign Cases

Benign cause for obstructive jaundice was seen in 40 (66.6 %) patients out of a total of 60 patients. The most common conditions were cholechololithiasis, seen in 26 patients, CBD stricture (distal) in 06 patients, cholechal cyst type 1 in 5 patients and Mirizzi's syndrome in 3 patients (Table 4).

Diagnosis	Frequency	Percentage
Ampullary carcinoma	12	60.0
Carcinoma head of pancreas	6	30.0
Distal cholangiocarcinoma	1	5.0
Duodenal malignancy	1	5.0

Table 5. Conditions of Obstructive Jaundice in Malignant Cases

Malignant cause for obstructive jaundice was seen in 20 (33.3 %) patients. Ampullary carcinoma is the most common of all in this study accounting to 12 out of 20 cases. Carcinoma head of pancreas is seen in 06 patients, distal cholangiocarcinoma in 1 patient and duodenal malignancy in one patient on histopathological examination of the resected specimen. (Table 5)

Feature	Benign	Malignant
Morbidity	20 %	38 %
Mortality	0 %	25 %
Average hospital stay	10 days	16 days
Re-laparotomy	0	1

Table 6. Outcome Distribution in Benign and Malignant Cases

When comparing the outcome between benign and malignant cases, Re-Laparotomy was done in 1 patient with malignant condition (patient who developed pancreatic leak). The morbidity and mortality rates were higher in patients with malignancy. There was no death in benign conditions. 2 patients died in the postoperative period while 3 died during follow-up due to disease with malignancy. (Table 6)

DISCUSSION

Obstructive jaundice is a common manifestation of biliary tract disorders and the evaluation and management of the obstructive jaundice in patient is one of the challenges faced by the surgeon. During evaluation of a case of obstructive jaundice, a thorough history, a complete physical examination, varied biochemical and radiological tests are necessary. Once the aetiology of obstructive jaundice is established, appropriate treatment options are instituted.

In this study, first the pattern and aetiology of obstructive jaundice in these parts is noted and analyzed. Also, the various clinical presentations of obstructive jaundice were studied. Every case of obstructive jaundice was thoroughly investigated. Various treatment modalities practiced for obstructive jaundice in these parts were studied.

A total of 60 cases were studied. At first the cases were divided on the basis of aetiology causing obstructive jaundice into benign and malignant. There were 40 benign cases and 20 malignant cases. Then each of the category was divided into different age groups. The age groups were < 40 year; 41 – 50 years; 51 - 60 years; 61 - 70 years and > 70 years. Each of the age groups were further separated on the basis of sex.

Most common cause of obstructive jaundice in this study was benign (66.6 %) while malignancy accounted for the rest (33.33 %). This is in accordance with the literature which regards most common cause for obstructive jaundice as benign and in conformity with the prospective descriptive study of Huis et al. Croatia 2006. But this is in contrast to

other studies like that of S. Verma et al. 2010 where most common cause was malignant.

In this study, the peak incidence of obstructive jaundice due to benign condition was seen in patients < 40 years of age whereas malignancy was common in the age group of 51 - 60 years. The mean age for benign patients is 40.9 years while for malignant mean age is 55.2 years which is similar to study done by Muhammad Saddique⁹ from Pakistan. This proves that benign diseases affect younger ages while malignant diseases afflict mainly old patients.

Study mean age in years. Out of 60 cases, 35 (58.3 %) were females and 25 (41.6 %) were male patients. Female to male ratio 1.4 : 1. Females account for 70 % (28 out of 40) of benign cases while males predominate in malignant group at 65 % (13 out of 20). This is in comparison to study by Mohammad Saddique⁹ while most other studies showed male preponderance.

The common presentation in benign cases of obstructive jaundice in this study was pain abdomen (95 %) whereas in malignant cases jaundice (90 %) accounted for most common presentation. All cases of obstructive jaundice whether benign or malignant had icterus (100 %) at the time of admission. Pallor was present in 30 % of the cases, most of them were malignant. Loss of appetite and loss of weight were significantly seen in malignant conditions. While fever, nausea and vomiting were more common in benign conditions. Pruritus was seen in 60 % of all the cases being more commonly seen in benign conditions (70 %) than malignant. Clay colored stools were seen in 13 out of 20 cases of malignancy (65 %).

Gallbladder was palpable in 40 % of the cases of malignancy. These results were compared with other studies. In the study by Siddique K et al. Pakistan, 2008 most common presentation was clay colored stools (75 %) in malignant cases and abdominal pain (51.7 %) in benign cases. Tompkins et al. 1990 and other authors (Kelson DP et al. 1997) reported abdominal pain in less than one-third of their patients.

Muhammad Saddique et al. Karachi, 2004 reported abdominal pain and pruritus in all the cases of obstructive jaundice. Moghimi M et al. Iran, 2004 reported clay colored stools and jaundice as most common presentation in malignant cases and pain abdomen as most common presentation in benign cases.

As we can see from above table, choledocholithiasis and periampullary carcinoma are common causes of obstructive jaundice in these parts. In the radiological studies, ultrasound¹⁰ abdomen was done in all the patients in our study. Ultrasound abdomen was successfully used as it is a cheapest non-invasive tool to know the cause and level of obstruction in most of the cases.

The limitation of this imaging modality was its high operator dependence. Contrast enhanced computed tomography (CECT)¹¹ abdomen was done in 28 patients. It was done in all the malignant cases (20) to know the size of the mass, extent of spread and to assess resectability. 8 cases of obstructive jaundice due to benign causes underwent CECT for confirmation of the diagnosis. Magnetic resonance imaging (MRI) with magnetic resonance cholangiopancreatography (MRCP) abdomen was done in 14

out of 60 cases of obstructive jaundice. Endoscopic retrograde cholangiopancreatography (ERCP) was done in 22 cases. All failed ERCP (in extracting CBD stones) were referred to surgery for open CBD exploration and stone retrieval. It is also done for pre-operative stenting in some of the malignant cases. Compared to other studies, no of cases were small in our study but still the resectable rates are comparable. Our mortality rates are comparatively higher. When compared to John Hopkins study, our study has lower mean age of presentation, lower pylorus preserving pancreaticoduodenectomies and high mortality rates.

CONCLUSIONS

Benign causes are the most common cause of obstructive jaundice. Choledocholithiasis is the most common cause in this study. In malignant obstructive jaundice, periampullary carcinoma is the most common cause. Benign conditions causing obstructive jaundice are most common under 40 years of age while malignant obstructive jaundice is commonly seen between 50 and 60 years of age.

Malignant obstructive jaundice is most commonly seen in males while benign conditions are more common in females. The commonest presentation of malignant obstructive jaundice is jaundice and that of benign is pain in abdomen. Serum bilirubin (total and direct), alkaline phosphatase levels are more elevated in malignant obstructive jaundice than in benign obstructive jaundice. Pallor was seen more in malignancy.

Ultrasound of abdomen is the first, cheap, highly sensitive non-invasive imaging modality available. CECT abdomen is required in all cases of malignant obstructive jaundice to assess operability. MRCP and ERCP are other useful investigations in the management of obstructive jaundice. Open exploration of CBD under experienced hands is safe and best treatment modality for complicated choledocholithiasis.

In malignancies, early detection, staging and proper selection of the patient are more important to gain benefit from resection of tumour, whereas late presentation and those patients not suitable for resection had a comparatively good improvement in quality of life with palliative procedures. Most morbid complication following surgery for malignant disease is pancreatic fistula.

Morbidity and mortality rates were higher for malignant

disease than benign conditions causing obstructive jaundice. Average length of hospital is also more for malignant obstructive jaundice than benign. Re-laparotomy rates are also higher in malignant disease.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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