

## EVALUATION OF THE AETIOLOGICAL SPECTRUM OF OBSTRUCTIVE JAUNDICE

Khurram Siddique, Qasim Ali, Shirin Mirza, Aiza Jamil, Aisha Ehsan, Sarmad Latif, Asif Zafar Malik

Department of Surgery, Unit-II, Holy Family Hospital, Rawalpindi, Pakistan

**Background:** Jaundice is a common problem in medical and surgical gastroenterological practice. The surgical jaundice can be caused by the obstruction of the bile duct as with gall stones, strictures, malignancy, such as cholangiocarcinoma (in which the jaundice is persistent and progressive), periampullary carcinoma, carcinoma gall bladder<sup>6</sup> and carcinoma head of pancreas. The objective of this descriptive study was to evaluate the Etiological spectrum of obstructive jaundice. **Methods:** A prospective, descriptive study was carried out at Surgical Unit-II Holy family Hospital, Rawalpindi, from mid of May 2006 till March 2007. Sixty patients, who presented in the surgical OPD of Holy family Hospital, were included in the study. Thorough history and physical examination was followed by biochemical tests and various investigations like USG abdomen, ERCP, CT-Scan, & MRCP and histopathology. The data was analyzed using SPSS ver 14.0. **Results:** Of the 60 patients; 40 (66.66%) were male and 20 (33.33%) were female, their mean age being 49.50 years. Malignant obstructive jaundice was seen in 34 (56.66%) patients while 26 (43.33%) had benign etiology. Amongst the commonest symptom; clay coloured stools (75%) was more frequent in patients with malignant disease whereas abdominal pain (51.66%) was most common in benign conditions. Commonest malignancy was Carcinoma (Ca) of the head of pancreas 18/60 (30%) followed by Ca gall bladder 8/60 (13.33%), cholangiocarcinoma 7/60 (11.66%), and periampullary carcinoma 1/60 (1.66%). Choledocholithiasis 21/60 (35%) was the commonest benign cause followed by stricture of common bile duct 3/60 (5%) and acute pancreatitis 2/60 (3.33%). **Conclusion:** Obstructive jaundice is common amongst females and the cause is mostly malignant. Ca head of pancreas is the commonest malignancy while Choledocholithiasis is the commonest benign cause. USG, ERCP and CT-Scan are important diagnostic modalities for evaluation of patient with obstructive jaundice with ERCP having the additional advantage of being therapeutic as well.

**Keywords:** Choledocholithiasis, Obstructive jaundice, ERCP, Ca Head of pancreas, Ca gall bladder.

### INTRODUCTION

Jaundice is a common problem in medical and surgical gastroenterological practice.<sup>1</sup> Its cause can often be correctly anticipated clinically but usually investigations are required for confirmation. It could be because of a variety of causes and is less commonly seen outside the gastroenterology and hepatobiliary surgery.<sup>1</sup> Regarding surgical obstructive jaundice (jaundice due to intra or extra-hepatic organic obstruction to biliary outflow), can present problems with the diagnosis and management.<sup>2</sup> The surgical jaundice can be caused by the obstruction of the bile duct as with gall stones<sup>3</sup>, strictures, malignancy<sup>3,4</sup>, such as cholangiocarcinoma (in which the jaundice is persistent and progressive<sup>5</sup>), periampullary carcinoma, carcinoma gall bladder<sup>6</sup> and carcinoma head of pancreas.<sup>4,6,7</sup> Various rare causes like the castle Mann disease<sup>8</sup>; Caroli's syndrome<sup>9</sup> and metastatic liver tumor<sup>10</sup> have also been reported. The symptoms of obstructive jaundice include jaundice with or without pain, dark urine, pruritis, pale stools, weight loss and anorexia.<sup>4</sup> Obstructive jaundice is characterized by the raised levels of serum alkaline phosphatase rather than aspartate transaminase.<sup>11,12</sup> There are various investigations which could be carried out for the diagnosis of obstructive Jaundice like ultrasonography<sup>6,13</sup> which can pick up gall stones, dilated intra-extra hepatic channels, any mass in the

abdomen and presence of fluid in the peritoneal cavity, but the Gold standard is Endoscopic Retrograde Cholangiopancreatography (ERCP).<sup>5,14</sup> ERCP can pick up choledocholithiasis, strictures of CBD, any obstruction of the CBD as well as helps in taking the brushing cytology. Computerized tomography, Endoscopic ultrasound, Percutaneous Transhepatic Cholangiopancreatography (PTC) and Magnetic Resonance Cholangiopancreatography (MRCP) can also be used when required.<sup>15</sup> The serial LFT's though done at various centres remained unsuccessful to differentiate the medical Jaundice from Organic causes.

There is huge discrepancy between the recognized (common and rare) causes of Obstructive Jaundice at various centres and it is mandatory to determine pre-operatively the existence, the nature of obstruction because an ill-chosen procedure can lead to high morbidity and mortality.<sup>1,2</sup> Also it is essential to know about the various risk factors which increase the morbidity and the mortality to a significant extent like raised TLC, low albumin level, malignancy etc.<sup>16</sup>

### PATIENTS AND METHODS

This hospital based descriptive study was conducted from May 2006 till March 2007 in Surgical Unit-II,

Holy Family Hospital, Rawalpindi. Non-probability convenient sampling was done and the first 60 patients, who presented with obstructive jaundice because of any reason, were selected for the study. All patients of any age, sex and profession who had symptoms of obstructive Jaundice confirmed with raised serum alkaline phosphatase was included in the study. All patients with medical jaundice and cirrhosis of liver were excluded.

A thorough clinical history including age, sex and relevant features like presence of clay coloured stools, anorexia, weight loss, pruritis were taken and correlated with the examination findings of presence of jaundice, scratch marks, abdominal mass and hepatomegaly. A working diagnosis was then made and further workup was planned which included the Liver Function tests to see the bilirubin level and the level of serum alkaline phosphatase. Abdominal Ultrasound was done to look for the abnormality of Intra and Extra-hepatic biliary channels, the common bile duct and presence of any gall stones or any abdominal mass. ERCP was carried out whenever possible to look for the cause of obstructive jaundice. Computed Tomography Scan (CT scan), PTC and MRCP were done whenever indicated. The final diagnosis was then made on the basis of results of these advanced investigations and histopathology; the results were then compiled. The data was analyzed by the Statistical Program for social Sciences (SPSS-14) for the analysis of the various causes of Obstructive jaundice, the age of the patients, the sex distribution, the percentage of Benign and the malignant cases. *t*-test and Fischer tests were also used for the analysis.

## RESULTS

Out of 60 patients who were evaluated 40 (66.66%) were female and 20 (33.33%) were male. The mean age of the study population was 49.50 years (range 30–80 years). Majority of benign causes were seen in 31–40 years of age, while the malignant cases were more common between 51–70 year old. The difference in age distribution of the benign and malignant disease was statistically significant ( $p < 0.05$ ). Malignant obstructive jaundice was seen in 34 (56.66%) patients while 26 (43.33%) had benign aetiology.

Regarding the symptoms, 20 (33.3%) patients with benign disease while 25 (41.7%) with malignancy gave history of clay coloured stools. All the symptoms being evaluated were present in 12 (20%) patients. Out of which 3 (5%) patients had benign disease while 9 (15%) had malignancy.

The examination findings revealed that 24 (40%) patients had scratch marks, equal for both benign and malignant causes. The abdominal mass was appreciated in 18 (30%) patients with malignancy. (Table-1)

Choledocholithiasis was the commonest amongst the benign causes and was seen in 21 (35%) patients including a case of Mirizzi's syndrome (Figure-1). Amongst the 60% cases of malignant obstructive jaundice, 18 (30%) had carcinoma head of pancreas which was the highest. (Figure-2)

The value of ALT was found to be elevated in 43.3% (26/60) of the cases. Values of serum bilirubin and serum alkaline phosphatase were statistically analyzed for the benign and the malignant causes. The abdominal ultrasound was able to pick the dilated intra and extra hepatic channels in about 24% and 22 % of the cases respectively.

ERCP was able to demonstrate the dilated CBD as well as choledocholithiasis in 38.3% (23/60) of the benign cases .ERCP also showed some diagnostic yield in picking up Ca-Gall Bladder (4/8), Cholangiocarcinoma (3/7). The CT-Scan helped in diagnosing CA-Head of Pancreas in 30% (18/60) of the malignant cases.



Figure-1. ERCP of a patient showing the Mirizzi's syndrome along with choledocholithiasis.

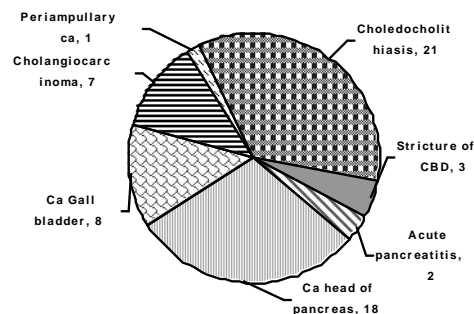


Figure-2: Various causes of obstructive jaundice

**Table-1: Symptoms and signs for benign and malignant causes of obstructive jaundice**

Symptoms	Benign	Malignant	Total
Clay coloured stools	20	25	45
Pruritis	16	17	33
Anorexia/ wt. loss	8	23	31
Abdominal pain	21	10	31
Scratch marks	12	12	24
Abdominal mass	1	18	19

## DISCUSSION

The obstructive lesions of the biliary system are difficult problem for the surgeon as most of the patients are old and poor surgical risks.<sup>2</sup>

This prospective study in a defined population revealed clinically the causes of obvious obstructive jaundice in our setting over a ten months period, the jaundice being proved by history, examination and laboratory investigations.

Majority of patients in this study had malignant obstructive jaundice, i.e., 56.66% (34/60) while the benign jaundice was seen in 43.33% (26/60). Various other studies have been done for the evaluation of the etiological spectrum of obstructive jaundice and the study by Muzaffar Aziz *et al* showed the incidence of malignant jaundice in 84% and benign in 16% of the patients.<sup>4</sup> (Table-2)

In this study, both the benign and malignant obstructive jaundice are found more commonly amongst the females than males. The male to female ratio for benign jaundice was 1:3, while it was 1:1.2 for the malignant obstructive Jaundice. The increased incidence of Obstructive jaundice amongst the females is due to the fact that gall stones are frequently found in them.<sup>18-20</sup>

The mean age of the patients with the benign or malignant aetiology of obstructive jaundice was 42.04 and 56.38 years respectively. Most of the patients with the benign jaundice were between 31-40 years of age while malignant causes were more common in the older patients and were maximally seen between 51-70 years of age. The increased incidence of malignant obstructive jaundice with the increasing age has also been reported by Muzaffar Aziz *et al*.<sup>4</sup>

Regarding the various causes diagnosed carcinoma head of pancreas was the commonest amongst the malignancies (30%) followed by the carcinoma gall bladder (13.3%), cholangiocarcinoma (11.66%) and periampullary carcinoma (1.66%). Similar incidence of various malignancies in patients of obstructive jaundice has been shown in various studies Table-3.

Four (6.67%) female patients and 2 (3.33%) male had Ca Gall Bladder also had gall stones. The association of Carcinoma Gall Bladder with gall stones has been reported in literature.<sup>19-23</sup> The patients with

these malignancies also had the palpable masses in the right hypochondrium thus supporting the Courvoisier's law.<sup>24</sup>

Cholelithiasis was the most common cause over all among various causes of obstructive jaundice. Cholelithiasis was also found to be the commonest cause in the study by Fatima *et al*<sup>7</sup> accounting for 47.2% of cases.

Among the symptoms, Clay coloured stools was reported more commonly by patients with the malignant jaundice. Pruritis was seen equally in both the benign and malignant cases. Anorexia and wt. loss were more frequently seen amongst the patients of malignant jaundice. The pain in the abdomen (the right hypochondrium) was more frequently seen amongst the benign causes and was almost always present in every case of cholelithiasis. While almost 30% of the patients with malignancy also had abdominal pain on presentation possibly due to advanced disease.<sup>6</sup>

The abdominal mass was appreciated in 18/34 of the patients with malignancy due to the local spread of tissues and no mass was palpable in cases of cholelithiasis or any other benign condition thus supporting the 'Courvoisier's law'.<sup>24</sup>

The scratch marks were seen in equal percentage of patients amongst the benign and malignant conditions. The presence of these signs and symptoms has also been confirmed by other studies.<sup>4,6,22,23,25</sup>

The biochemical investigations done was liver function tests which showed high serum bilirubin and alkaline phosphatase level. The levels of serum bilirubin and alkaline phosphatase were statistically analyzed for the benign and malignant causes. No statistically significant difference in the values was noted whatever the cause of jaundice may be ( $p>0.05$ ). Though in one of the studies the values of bilirubin and alkaline phosphatase were found to be higher in the malignant cases.<sup>12</sup>

The value of PT and APTT were also calculated and were found to be higher in every case of obstructive jaundice though they were much deranged in cases of malignancy. The derangement in PT was from 3-8 sec. while it was 4-12s for APTT. The coagulopathy is caused because of damage to the hepatocytes caused by obstructive jaundice.<sup>4</sup>

Amongst the radiological investigations<sup>12,13</sup> ultrasound abdomen picked the dilated intra-hepatic channels in 24%; the dilated extra-hepatic in 22% while CBD stones were found in 12%. The CBD was found to be dilated in 24% of the patients and its measurement ranged from 1.4 cm to 2.4 cm with a mean value of 1.46cm. Mass was picked up in only 26% of the patients and most of the time it was mass of head of pancreas. The diagnostic accuracy of USG

has been studied in detail. One of the study conducted by Akhtar S *et al* showed it to be 85%.<sup>15</sup> While it is considered reliable in the other studies as well.<sup>12,13</sup>

ERCP<sup>5,14</sup> was performed in most of the cases and it was able to pick up the cause whenever successful. Twenty one patients (35%) who had choledocholithiasis were diagnosed on the basis of ERCP, including the patient with Mirizzi's syndrome.<sup>26</sup> ERCP has been defined as a 'GOLD STANDARD' for the diagnosis of obstructive jaundice especially in case of CBD stones.<sup>5</sup>

The results of ERCP in picking up the diagnosis in case of malignant obstructive jaundice was relatively good but it was not possible to perform ERCP in all cases as it was difficult to cannulate the Ampulla of Vater either because of localized oedema or because of the external compression caused by the tumour. Though the findings in these cases included projections from the ampulla and dilated duodenum. ERCP revealed dilated CBD in about 74% of cases who had malignancy either because of Ca Head of Pancreas, Ca Gall Bladder and Cholangiocarcinoma. The study by Khurram *et al* also shows the diagnosis of these tumours by ERCP.<sup>14</sup>

CT-Scan was done for all the cases suspected of malignancy and the ones in which ERCP was unsuccessful and the diagnosis was made on the basis of its findings.<sup>12, 27</sup> Eighteen patients (30%) had Ca-Head of Pancreas, 8 patients (13.33%) had Ca Gall Bladder, 7 (11.66%) had Cholangiocarcinoma with 2 (3.33%) having the Klatskin's tumour, 1 (1.66%) patient had the Periampullary carcinoma.<sup>27,28</sup> The staging of these carcinomas was also done on the basis of local invasion, penetration outside the muscle wall and any metastasis. The poor prognosis was described for the patients who had large tumour size, locally advanced tumour, lymph node and distant metastases. This probably reflects the delays in the presentation of patient to the physician due to social and cultural factors. CT was also performed in the cases of acute Pancreatitis to look for any intra-abdominal collection, any necrosis of the Pancreas or pseudo cyst formation. The final diagnosis was then made based upon the results of histopathology and then results were drawn.

**Table-2: Comparison of Percentages of Benign and Malignant Jaundice**

Study	Benign causes	Malignant causes
Munir K <i>et al</i> <sup>17</sup>	48.97%	51.02%
Aziz M <i>et al</i> <sup>4</sup>	16%	84%
Cheema K <i>et al</i> <sup>12</sup>	35%	65%
Sharma MP <i>et al</i> <sup>6</sup>	24.7%	75.3%
<b>THIS STUDY</b>	<b>43.33%</b>	<b>56.66%</b>

**Table-3: Comparison of Various Studies done for Aetiological Spectrum of Obstructive Jaundice.**

Study	Ca Head of Pancreas	Ca Gall Bladder	Cholangiocarcinoma	Choledocholithiasis	Other
Munir <i>et al</i> <sup>17</sup>	14.2%	2.4%	6.12%	34.69%	12.54%
Sharma <i>et al</i> <sup>6</sup>	26.5%	28.7%	10.8%	12.4%	10.8%
Aziz <i>et al</i> <sup>4</sup>	31%	52%	10%	--	--
Fatima <i>et al</i> <sup>7</sup>	22.8%	21.15%	--	47.2%	--
<b>This study</b>	<b>30%</b>	<b>13.33%</b>	<b>11.66%</b>	<b>35%</b>	<b>5%</b>

**CONCLUSION**

It is concluded that obstructive jaundice is commonest amongst the females, malignant causes being more prevalent. The benign jaundice is seen in young patients while malignant causes in elder age group. CA head of pancreas is the commonest malignancy while Choledocholithiasis is the commonest benign aetiology. ERCP and CT-scan are important diagnostic tools for patient of obstructive jaundice.

**REFERENCES**

- Whitehead MW, Hains Worth I, Kingham JG. The causes of obvious jaundice in southwest Wales: perceptions vs reality. *Gut* 2001;48:409-13.
- Nadkarni KM, Jahagirdar RR, Kagzi RS, Pinto AC, Bhalerao RA. Surgical obstructive jaundice. *J Postgrad Med* 1981;27:33-9.
- Bekele Z, Yifru A. Obstructive jaundice in adult Ethiopians in a referral hospital. *Ethiop Med J* 2000;38:267-75
- Aziz M, Ahmad N, Faizullah. Incidence of malignant obstructive jaundice-A study of hundred patients at Nishtar Hospital Multan. *Ann KE Med Coll* 2004;10:71-3
- Acalovschi M. Cholangiocarcinoma: risk factors, diagnosis and management. *Rom J Intern Med* 2004;42:41-58.
- Sharma MP, Ahuja V. Aetiological spectrum of obstructive jaundice and diagnostic ability of ultrasonography clinician's perspective. *Trop Gastroenterol*.1999;20:67-9.
- Ahmed F, Khan AFA, Ahmed A, Cheema KM. Extra hepatic biliary obstruction: A study of etiological factors in a teaching hospital. *Ann KE Med Coll* 1997;2:6-8.
- Al-Salamah SM, Khan IA, Khalid K, Al-Shakweer WA. Castleman disease presenting as obstructive jaundice. *Saudi Med J* 2005;26:111-3.
- Tamiolakis D, Arvanitidou V, Nikolaidou S, Barbagadaki S, Avgidou K *et al*. Caroli's syndrome. A case report and review of literature. *Minerva Gastroenterol Dietol* 2004;50:179-81.
- Kobayashi T, Makuuchi M, Sano K, Koyama K, Motoi T. Repeated obstructive jaundice and acute pancreatitis caused by metastatic liver tumor: an unusual cause. *Hepatogastroenterology* 2005;52:220-2.
- Hayat JO, Loew CJ, Asress KN, McIntyre AS, Gorard DA. Contrasting liver function test patterns in obstructive jaundice due to biliary strictures and stones. *QJM* 2005;98:35-40.
- Cheema KM, Ahmad F, Gondal SH. Evaluation of etiological incidence and diagnostic modalities in obstructive jaundice. *Pak Postgrad Med J* 2001;12:160-4.
- Ghaffar A, Buledi GQ, Imran M. Role of imaging in obstructive jaundice *J Surg Pakistan* 2004;9:24-6.
- Khurram M, Durrani AA, Hasan Z, Butt AUA, Ashfaq S. Endoscopic retrograde cholangiopancreatographic evaluation of patients with obstructive jaundice. *J Coll Physicians Surg Pak* 2003;13:325-8.

15. Akhtar S, Mufti TS. Diagnostic accuracy of obstructive jaundice on ultrasonography at Ayub Hospital complex. J Ayub Med Coll Abbottabad 1999;11:45-6.
16. Pitiakoudis M, Mimidis K, Tsaroucha AK, Papadopoulos V, Karayiannakis A, Simopoxlos C. Predictive value of risk factors in obstructive jaundice. J Int Med Res 2004;32:633-8.
17. Munir K, Bari V, Yaqoob J, Khan DBA, Usman MU. The role of Magnetic resonance Imaging (MRI) in Obstructive jaundice. J Pak Med Assoc 2004;54:128-32.
18. Channa NA, Khand FD, Bhangar MI, Leghari MH. Surgical incidence of Cholelithiasis in Hyderabad and adjoining areas (Pakistan). Pak J Med Sci 2004;20:13-7.
19. Zarin M, Ahmed M, Gohar A, Waheed D, Khurram S et al. Incidence of gall stones in carcinoma Gall Bladder patients. Pak J Surg 2005;21:19-22.
20. Ullah N, Gondal SK, Shahbaz RA. Carcinoma Gall Bladder; an incidence study at Services Hospital Lahore. Pakistan Postgrad Med J 2000;11:156-7.
21. Samad A. Gall bladder carcinoma in patients undergoing Cholecystectomy for cholelithiasis. J Pak Med Assoc 2005;55:497-9.
22. Rahman A, Shah SMA, Khan N, Arif A, Asadullah. Frequency of carcinoma Gallbladder in patients undergoing surgery for chronic cholecystitis with cholelithiasis. J Med Sci 2006;14:26-9.
23. Nawaz T, Khan RA, Malik AZ, Anwar I, Younus M. Incidence of Carcinoma Gall Bladder in Cholelithiasis. Pak J Surg 2000;16:33-6.
24. Russell R.C.G. The Gall Bladder and bile duct. In: Russell R.C.G, Williams N.S, Bulstrode C.J.K. Bailey & Love's short practice of Surgery, 24<sup>th</sup> ed. London: Arnold publishers, 2004; p.1094-5,1103-6.
25. Cuschieri SA. Disorders of the biliary tract. In: Cuschieri SA, Steele RJC, Moosa AR: Essential surgical practice. 4<sup>th</sup> ed, vol-2. London: Arnold publishers, 2002; p 442-8.
26. Freeman M, Rose Jeffery, Forsmark C, Vaythey J.N. Mirizzi Syndrome. A rare cause of obstructive jaundice. Digestive diseases 1999;17:44-8.
27. Harvey RT, Miller JWT. Acute biliary disease: Initial CT and follow-up US versus initial US and follow-up CT. Radiology 1999;213:831-6.
28. Barlas NB, Anjum MN, Sabir S, Aslam MI. Computed Tomography in obstructive jaundice preponderance of dilated intrahepatic biliary channels in left lobe. Pakistan Postgrad Med J 2000;11:129-31.

---

**Address for Correspondence:**

**Dr. Khurram Siddique**, H. No: 70/E, Holy Family Road, Satellite Town, Rawalpindi, Pakistan.

**Address at UK:** Dr. Khurram Siddique, Specialist Trainee, General Surgery, William Harvey Hospital Ashford, UK.

**Email:** sk\_sid@hotmail.com