

# Etiological Spectrum of Obstructive Jaundice in Tertiary Hospital of Quetta

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## Abstract

**Objective:** To identify the etiological spectrum of obstructive jaundice in patients presenting in Bolan Medical Complex Hospital Quetta.

**Study type, settings & duration:** This descriptive cross-sectional study was conducted at Department of General Surgery, Bolan Medical Complex Hospital, Quetta from December 2017 to June 2018.

**Methodology:** A total number of 211 patients having age 15 to 65 years with diagnosis of obstructive jaundice were included. All radiological tests like ultrasound, CT scan and Magnetic Resonance Cholangio-pancreatography of the patients was done to determine the etiology of obstructive jaundice. After surgery, the histopathological examination of the biopsy was also done. Data analysis was done through SPSS v23 software.

**Results:** Mean age of study patients was 47.86±12.40 years. There were 131 (62.09%) female patients and only 80 (37.91%) male patients. There were 87 (41.23%) patients who presented with benign causes while remaining 124 (58.77%) patients who presented with malignant causes. Among the benign causes, stone in common bile duct (CBD) were most common presented in 51 (24.2%) patients while 36 (17.1%) patients presented with stricture. Although pancreatic head carcinoma was the most prevalent disease diagnosed in 69 (32.7%) patients with malignant conditions, peri-ampullary carcinoma in 24 (11.4%) patients, gallbladder carcinoma in 22 (10.4%), and cholangio-carcinoma in just 9 (4.3%) patients.

**Conclusion:** As compared to benign causes, malignant causes of obstructive jaundice are more frequent. The highest prevalent tumour among malignant causes is pancreatic head carcinoma, while stones in the common bile duct are highly prevalent among benign causes of obstruction in our population.

**Key words:** Etiological spectrum, choledocholithiasis, carcinoma head of pancreas, obstructive jaundice.

## Introduction

Obstructive jaundice is a serious surgical issue that has resulted in a significant increase in morbidity and death.<sup>1</sup> Heterogeneous group of disorders, including both benign and malignant, may cause it. In malignant cases the early diagnosis of the obstruction cause is extremely critical because

resection is only possible management at that stage.<sup>2-4</sup>

The causes of obstructive jaundice varies from person to person and from centre to centre. Strictures and stones in the bile duct are several common benign causes, whereas common malignant etiologies include gall bladder carcinoma, peri-ampullary carcinoma, cholangiocarcinoma, and pancreas carcinoma.<sup>2,3,5</sup> Pale stools, jaundice without or with pain, dark urine, pruritis, anorexia, and weight loss are all indications of obstructive jaundice.<sup>6</sup> Rather than aspartate transaminase, serum alkaline phosphatase levels are increased in obstructive jaundice.<sup>5,6</sup>

Obstructive jaundice treatment raises diagnostic and clinical problems for general surgeons working in a resource-limited field in particular. There is a significant discrepancy in the known causes of obstructive jaundice in various centres, and the presence, as well as the kind of obstruction, must be determined prior to surgery

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### Authors Contribution

SA, SM & AK conceptualized the project. SA, MT & MZB did the data collection. AK & MZB did the literature search. Statistical analysis, drafting, revision & writing of manuscript were done by KA.

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since a poorly chosen therapy will result in high morbidity and mortality.<sup>2</sup>

Even within Pakistan, there are significant variances in the etiology of obstructive jaundice. Therefore, we conducted this research to evaluate the etiological spectrum of obstructive jaundice in patients who presented to a tertiary care hospital in Baluchistan, Pakistan.

## Methodology

From December 19, 2017 to June 18, 2018, a descriptive cross-sectional study was done at the Bolan Medical Complex Hospital Quetta's Department of General Surgery. Sample size of 211 was estimated using Rao-soft sample size calculator by taking statistics of biliary stricture as 5.2%,<sup>8</sup> margin of error set as 0.03 and 95% confidence level. The non-probability, consecutive sampling was applied for the selection of samples. All patients with the diagnosis of obstructive jaundice (serum total bilirubin as 2.5 mg/dl and direct bilirubin as >2 mg/dl on LFT along with yellow skin and sclera assessed clinically) of age 15-65 years and either gender were included in the study. The research excluded patients who had jaundice owing to reasons other than obstructive disease, such as hepatocellular or hemolytic jaundice.

After describing to them the whole protocol, method and purpose of analysis, written informed consent was obtained from the participants. After taking baseline details, patients were tested for obstructive jaundice from the etiological continuum. The malignant causes of jaundice were further classified into subcategories e.g. carcinoma of gallbladder, carcinoma of head of pancreas, and cholangio-carcinoma. While benign causes were further subcategorized into stricture and stone in common bile duct. Liver function test, ultrasonography, CT scan, and Magnetic resonance cholangio-pancreatography test was used in a step by step manner to manner to sub-classify the causes of obstructive jaundice.

An ultrasound was used to detect gallbladder carcinoma, which was a rapid, non-invasive imaging procedure. A computed tomography scan was used to ascertain the existence of an irregular mass if cancer was detected, and to better show the size and magnitude of the tumour. Carcinoma of head of pancreas was confirmed on the basis of raised serum total bilirubin i.e. >2.5 mg/dl, raised serum alkaline phosphatase >147 IU/L and ultrasound. Magnetic Resonance Cholangio-pancreatitis test was done to confirm the size and extent of tumor. Cholangio-carcinoma was detected by ultrasound and confirmed on contrast

CT scan. Magnetic Resonance Cholangio-pancreatography was also be used if there was a need to see a three dimensional view. Stricture of common bile duct was confirmed on the basis of raised serum total bilirubin i.e. >2.0 mg/dl, raised serum alkaline phosphatase >147 IU/L and ultrasound. CT scan and Magnetic Resonance Cholangio-pancreatography test was done to confirm the morphology of stricture. Stone in common bile duct was confirmed on the basis of raised serum total bilirubin i.e. >2.0 mg/dl, raised serum alkaline phosphatase >147 IU/L and ultrasound. After surgery the histopathological examination was also done from BMCH, Quetta.

Data analysis was done through SPSS version 23.0. For continuous variables, like age, obstructive jaundice duration and BMI, mean and standard deviation were calculated. For categorical variables such as gender, obesity, residential status, and etiological jaundice spectrum, frequencies and percentages were measured. Effect modifiers such as age, gender and duration of jaundice, obesity and residential status were addressed by stratification. Chi-square-test was applied after stratification, keeping  $p$ -value  $\leq 0.05$  as significant.

The ethical approval was obtained from Ethical Review Committee of Bolan Medical Complex Hospital, Quetta vide reference no. 3964.

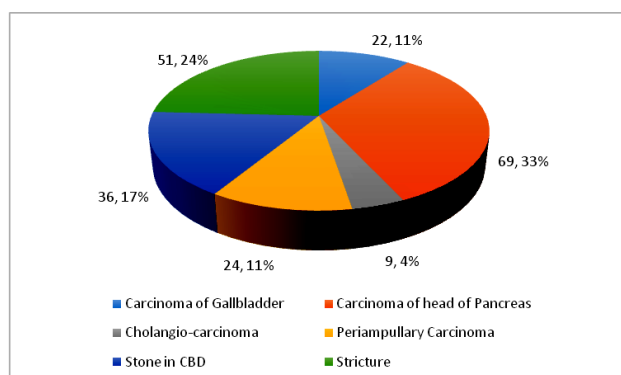
## Results

This study included a total of 211 patients. Mean age of the patients was  $47.86 \pm 12.40$  years. The minimum and maximum ages were 15 and 65 respectively. This study included 131 female patients (62.09%) and only 80 male patients (37.91%). Patients had a BMI of  $26.15 \pm 4.30$  kg/m<sup>2</sup> on average. There were 33 obese individuals (15.64%) and 178 healthy patients (84.36%). Mean duration of obstructive jaundice was  $3.46 \pm 1.69$  months (Table-1).

**Table 1: Baseline characteristics. (n=211)**

|                              | Mean $\pm$ SD     |
|------------------------------|-------------------|
| Age in years                 | 47.86 $\pm$ 12.40 |
| BMI (kg/m <sup>2</sup> )     | 26.15 $\pm$ 4.30  |
| Duration of disease (months) | 3.46 $\pm$ 1.69   |
| n (%)                        |                   |
| <i>Gender</i>                |                   |
| Female                       | 131 (62.1)        |
| Male                         | 80 (37.9)         |
| <i>Residence</i>             |                   |
| Rural                        | 116 (55)          |
| Urban                        | 95 (45)           |
| <i>Obesity</i>               |                   |
| No                           | 178 (84.4)        |
| Yes                          | 33 (15.6)         |

Regarding the etiology of obstructive jaundice, there were 87 (41.23%) patients who presented with benign causes while remaining 124 (58.77%) patients who presented with malignant causes. Among the benign causes, stone in common bile duct (CBD) were most common presented in 51 (24.2%) patients while 36 (17.1%) patients presented with stricture. While regarding malignant causes, carcinoma of the head of pancreas was the commonest pathology diagnosed in 69 (32.7%) patients, peri-ampullary CA in 24 (11.4%) patients, CA of gallbladder in 22 (10.4%), and Cholangio-carcinoma in only 9 (4.3%) patients (Figure).



**Figure: Etiological spectrum of obstructive jaundice.**

Stratification of age, gender, residential status and duration of disease was done. Statistically there was no significant effect of age, gender, residential status and duration of disease

on etiological spectrum of obstructive jaundice (Table-2).

## Discussion

Obstructive jaundice causes diagnostic and therapeutic challenges for general surgeons, as well as a significant increase in morbidity and death.<sup>7</sup> Delay in disease presentation along with a lack of contemporary diagnostic (such as CT scan, MRCP, ERCP, and PTC) and treatment services (such as T-tubes) are among the most evident problems in developing nations like Pakistan.<sup>5,8,9</sup> In our local context, this research was carried out to identify the etiological pattern of obstructive jaundice in a Baluchistan Tertiary Care Hospital.

In the current research, most of the patients had malignant obstructive jaundice. In the study by Khurram et al. found malignant obstructive jaundice in majority of the patients (57%).<sup>5</sup> In another related study, Gupta et al. also found malignant etiologies in most cases (64%).<sup>1</sup> Whereas Bekele et al. performed a study in Ethiopia that revealed benign obstructive jaundice (choledocholithiasis) as the frequent cause of obstructive jaundice.<sup>7</sup>

In the present study, among the benign causes, stone in common bile duct (CBD) were most common presented in 51 (24.2%) patients while regarding malignant causes, carcinoma of the head of pancreas was the frequent pathology diagnosed in 69 (32.7%) patients. Same findings were revealed by the Syed N et al. and Moghimi M et al. in their studies.<sup>10,11</sup> While in the study by Afzal et al. choledocholithiasis was the most frequent benign

**Table 2: Stratification of etiological spectrum with respect to potential factors.**

| Age Groups          | Etiological Spectrum |              |                        |                |                     |                          |
|---------------------|----------------------|--------------|------------------------|----------------|---------------------|--------------------------|
|                     | Stricture            | Stone in CBD | CA of Head of Pancreas | CA Gallbladder | Cholangio-Carcinoma | Peri-ampullary Carcinoma |
| 15-30 years         | 15                   | 7            | 21                     | 5              | 1                   | 5                        |
| 31-50 years         | 10                   | 7            | 18                     | 8              | 1                   | 9                        |
| 51-65 years         | 26                   | 22           | 30                     | 9              | 7                   | 10                       |
| p-value             | 0.54                 | 0.29         | 0.43                   | 0.44           | 0.21                | 0.33                     |
| Gender              |                      |              |                        |                |                     |                          |
| Male                | 20                   | 12           | 24                     | 9              | 3                   | 8                        |
| Female              | 31                   | 24           | 56                     | 13             | 6                   | 16                       |
| p-value             | 0.82                 | 0.53         | 0.51                   | 0.75           | 0.778               | 0.62                     |
| Residence           |                      |              |                        |                |                     |                          |
| Rural               | 23                   | 23           | 37                     | 14             | 4                   | 15                       |
| Urban               | 28                   | 13           | 32                     | 8              | 5                   | 9                        |
| p-value             | 0.1                  | 0.24         | 0.78                   | 0.39           | 0.52                | 0.43                     |
| Obese               |                      |              |                        |                |                     |                          |
| Yes                 | 5                    | 3            | 13                     | 6              | 2                   | 4                        |
| No                  | 46                   | 33           | 46                     | 16             | 7                   | 20                       |
| p-value             | 0.19                 | 0.18         | 0.37                   | 0.11           | 0.57                | 0.88                     |
| Duration of disease |                      |              |                        |                |                     |                          |
| 1-3 months          | 28                   | 20           | 32                     | 12             | 6                   | 12                       |
| ≥4 months           | 23                   | 16           | 37                     | 10             | 3                   | 12                       |
| p-value             | 0.64                 | 0.65         | 0.24                   | 0.81           | 0.37                | 0.82                     |

cause and pancreatic carcinoma was the commonest malignant etiology.<sup>12</sup> In the study by Aziz et al. conducted in Multan city of Pakistan, frequency of benign causes of obstructive jaundice was 16% and that of malignant causes was 84%.<sup>8</sup> Whereas in another study conducted at Hayatabad Medical Complex Peshawar showed that 54% of the patients had jaundice due to common bile duct stones, 38.2% had malignancy of the biliary tract and biliary stricture was present in 5.2% cases.<sup>9</sup> As a result. Sharm & Ahuja shown gall bladder carcinoma as the frequent etiology of malignant obstructive jaundice.<sup>13</sup> Also, authors from Yemen and Saudi Arabia stated Ascariases Lumbricoides appears to be strongly linked to biliary tract disease that results in obstruction.<sup>14</sup> Gall bladder cancer (28.7%) was revealed to be the most prevalent cause in the study by Khanzada et al., followed by pancreatic carcinoma (26.5%).<sup>15</sup>

In China, a study was conducted on 82 patients which showed that cholangiocarcinoma as the main etiology of malignant obstructive jaundice (27%), whereas pancreatic carcinoma was present in 24% of the patients, metastatic carcinoma in 21% and gall bladder carcinoma in 17% respectively.<sup>16</sup> These findings reflect variations in the etiological spectrum from one centre to the next. In earlier studies, ganglio-neuroblastoma, primary non-lymphoma Hodgkin's of the duodenum, and squamous cell carcinoma of the distal common bile duct were shown to be other unusual causes of malignant obstructive jaundice.<sup>17-21</sup> In the current study, we have not found any of these unusual malignant causes.

In this study, benign and malignant obstructive jaundice were found to be more prevalent in females than in males, consistent with the findings of other studies.<sup>1,3,10,22</sup> Female preponderance of both benign and malignant obstructive jaundice has been linked to a high prevalence of gallstones, which is reported to be a risk factor for many benign and malignant conditions causing biliary obstruction.<sup>1,3,10,22</sup> A study performed by Khanzada et al. in Pakistan has also reported female predominance in their patients with obstructive jaundice.<sup>15</sup>

When it comes to obstructive jaundice, malignant rather than benign causes are more common. The most prevalent malignant tumour is pancreatic head carcinoma, while stones in the common bile duct are the most common benign cause of obstruction in our community.

**Conflict of interest:** None declared.

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