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Clinicopathological Spectrum of Obstructive Jaundice in a Tertiary Care Centre: A Prospective Study

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ABSTRACT
Background: Jaundice is the yellowish discoloration of skin and mucous membranes due to high levels of bilirubin. Amongst the different types of jaundice, obstructive/surgical jaundice poses a great challenge due to varied presentation and high morbidity and mortality. The present study was conducted to assess the clinicopathological spectrum of obstructive jaundice.
Methods: This cross-sectional, observational study was conducted on patients aged more than 18 years and diagnosed with obstructive jaundice. Demographic characteristics and relevant histories were noted. The findings of the laboratory investigations were recorded.
Results: It was noted that the majority of the patients belonged to the age group of 61-70 years (44.40%). Females (52.78%) were affected more than males. Abnormal/clay coloured stool and yellowish discoloration of the skin and sclera were the commonest presenting symptoms reported by 88.90% and 86.10% of patients, respectively, followed by pain in the abdomen (77.80%) and pruritus (77.80%). All patients had raised serum bilirubin levels and decreased serum proteins. Liver enzymes were increased in the majority of the patients.
Conclusion: Obstructive jaundice generally affects the elderly, with a female preponderance. Abnormal/clay-coloured stools, yellowish discoloration of skin and sclera, pain in the abdomen, and pruritus are the most commonly reported presenting symptoms. Laboratory tests show deranged liver function tests and decreased serum protein levels.

Key-words: Abnormal/clay coloured stool, Clinicopathological spectrum, Obstructive jaundice, Serum protein

INTRODUCTION

Jaundice is derived from the French word 'Jaunisse'; Jaune in French means Yellow [1]. Jaundice, medically termed 'Icterus', refers to the yellowish discoloration of the skin and mucous membranes. It is generally due to high levels of bilirubin in the body [2,3].

Bilirubin, which is the major catabolic end product of heme after removal of its iron component, is primarily metabolized by the liver and excreted in the urine and stool [4,5].

Accordingly, the causes for hyperbilirubinemia include pre-hepatic jaundice (due to haemolysis of red blood cells), hepatic jaundice (due to defect in capture, conjugation, and excretion of bilirubin by the liver) and post-hepatic jaundice (due to the obstruction of the extrahepatic biliary system). Depending upon the aetiology, jaundice may be either acquired or congenital [6]. Though the cause of jaundice can often be correctly anticipated clinically, biochemical and radiological investigations are often required for confirmation of diagnosis before planning surgical management.

Depending upon the cause, jaundice may broadly be categorized as either obstructive and non-obstructive jaundice. While non-obstructive jaundice can be managed medically, obstructive jaundice often requires surgical management. It may occur due to either intra- or extrahepatic organic obstruction to biliary outflow, i.e., a block in the pathway between the site of conjugation of

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bile in liver cells and the entry of bile into the duodenum through the ampulla. The obstruction may result from gallstones, strictures, or malignant diseases, like cholangiocarcinoma, carcinoma of the gall bladder or the head of the pancreas, and periampullary carcinoma. Rare causes include choledochal cyst, Caroli's syndrome and primary and metastatic liver tumours [7].

Apart from the varied aetiology, the high morbidity and mortality associated with obstructive jaundice are also of concern [8]. For planning surgical management, the exact aetiology needs to be determined, which may require an array of tests, both invasive and non-invasive, that are often time-consuming, expensive, and have limited availability. Hence, maintaining a high index of suspicion is imperative for early diagnosis of cases of obstructive jaundice and prompt initiation of treatment to reduce morbidity and mortality. Therefore, the present study was conducted to assess the clinicopathological spectrum of obstructive jaundice.

MATERIALS AND METHODS

Study Design and Setting- This was a cross-sectional, observational study conducted at Shri Rawatpura Sarkar Institute of Medical Sciences and Research, Nava Raipur, Chhattisgarh. The study adhered to the ethical standards of the 1975 Helsinki Declaration and its later amendments.

Study Population- A total of 36 patients, aged more than 18 years and diagnosed with obstructive jaundice, who were admitted during the study period, were included.

RESULTS

In the present study, it was noted that obstructive jaundice predominantly affects the population in the age

Inclusion Criteria
- Patients aged >18 years
- Diagnosed cases of obstructive jaundice
- Provided informed written consent

Exclusion Criteria
- Patients <18 years
- Non-obstructive jaundice
- Patients, who did not consent to participate

Methodology- After obtaining voluntary written informed consent, demographic details and clinical history were recorded. Diagnosis of obstructive jaundice was confirmed using ultrasonography (USG) and contrast-enhanced computed tomography (CECT). Routine blood investigations were conducted, including CBC, liver and kidney function tests, coagulation profile, and electrolytes. Special parameters like serum bilirubin, transaminases, ALP, proteins, albumin, sodium, and potassium were assessed using standard reference ranges.

Statistical Analysis- The descriptive statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) version 20. The qualitative parameters were expressed as numbers and percentages, while quantitative parameters were described in terms of mean and standard deviation.

group of 61 to 70 years, followed by the age group of 51 to 60 years. A slight female predilection was also noted (Table 1).

Table 1: Age-wise gender distribution of the study population

Age Group (years)	Males		Females		Total	
	Number	**%**	**Number**	**%**	**Number**	**%**
21-30	0	0	0	0	0	0
31-40	1	2.78	0	0	1	2.78
41-50	1	2.78	2	5.56	3	8.34
51-60	6	16.66	6	16.66	12	33.32
61-70	7	19.44	9	25.00	16	44.44
71 and above	2	5.56	2	5.56	4	11.12
Total	17	47.22	19	52.78	36	100

When assessed for presenting symptoms, abnormal/claycoloured stool was the commonest symptom (88.90%), followed by yellowish discoloration of skin and sclera (86.10%), pain in the abdomen and pruritus being reported by 77.80% of patients, each. Diarrhea (11.10%) and fever with rigors (16.70%) were the least common symptoms (Table 2).

Table 2: Distribution of presenting symptoms

Presenting Symptom	Number of cases	%
Abnormal/clay coloredstool	32	88.90
Yellowish discoloration of skin and sclera	31	86.10
Pain in abdomen	28	77.80
Pruritus	28	77.80
Dyspepsia	24	66.70
Loss of weight	22	61.10
Nausea/vomiting	16	44.40
Lump	10	27.80
Fat intolerance	10	27.80
Steatorrhoea	10	27.80
Fever with rigors	6	16.70
Diarrhoea	4	11.10

When assessed for laboratory findings, it was noted that bilirubin (total and direct) and total proteins were deranged in all the patients, followed by urea (97.2%), ALP (91.7%), and albumin (91.7%). SGOT and SGPT were found to be elevated in 75% and 55.6% of patients, respectively. INR was the least affected parameter being deranged in 22% of patients only (Table 3).

Table 3: Distribution of the findings of laboratory investigations

Parameter	Number	%	Mean	SD
Haemoglobin (g/dL)	29	80.6%	9.10	1.11
Total Leucocyte count (cells/mm^3)	17	47.2%	6237.31	4271.66
International Normalized Ratio(seconds)	8	22%	1.44	0.19
Random Blood Sugar (mg/dL)	24	66.7%	139.31	24.02
Urea(mg/dL)	35	97.2%	36.74	13.64
Creatinine(mg/dL)	14	38.9%	1.21	0.52

Total Bilirubin(mg/dL)	36	100.0%	15.09	5.23
Direct Bilirubin(mg/dL)	36	100.0%	10.66	4.05
SGOT (U/L)	27	75.0%	60.69	38.34
SGPT(U/L)	20	55.6%	61.97	21.43
Alkaline phosphatase(U/L)	33	91.7%	460.94	244.24
Total protein (g/dL)	36	100.0%	4.95	0.36
Albumin(g/dL)	33	91.7%	2.74	0.51
Sodium (mEq/L)	32	88.9%	130.71	3.00
Potassium (mEq/L)	24	66.7%	3.30	0.32

SGOT: Serum Glutamic-Oxaloacetic Transaminase; SGPT: Serum Glutamic Pyruvic Transaminase

DISCUSSION

Obstructive jaundice is a challenging condition for Surgeons in limited resource settings due to its varied presentation and high morbidity and mortality. Limited diagnostic facilities, in turn, affect the proper management of the condition, leading to further morbidity. The exact diagnosis of the underlying condition is crucial to the planning of surgical management, which may be time-consuming. Hence, a high index of suspicion is required not only for early institution of treatment but also for protecting patients of non-obstructive jaundice from exposure to the unnecessary plethora of tests. Therefore, this study was conducted to assess the clinicopathological features of obstructive jaundice.

The findings of the present study indicate that the 51 to 70 age group is the most affected age group with female preponderance. Abnormal or clay coloured stools, yellowish discoloration of skin and sclera, pain in the abdomen, and pruritus were the commonest presenting symptoms being reported in more than 75% of patients, each. Liver function tests are deranged in the majority of patients with significant derangement of liver enzymes. Verma et al. [9] included 110 patients in their study. They reported the mean age of the patients to be 50.4 years. However, they reported a male preponderance in their study (56%). They further reported that jaundice (88%) and pain in the right upper quadrant (66.2%) were the commonest presenting symptoms. They assessed the biochemical profile and noted that total bilirubin

concentration was elevated in more than 90% of the patients, with 31% of patients having concentrations more than 15 mg/dL. SGPT was elevated in 72% of patients, while SGOT was elevated in 60% of patients. ALP was reported to be elevated in 70% of patients. These findings were almost similar to the present study.

Irabor [10] included 30 patients with obstructive jaundice in their study. They noted a male-to-female ratio of 1:1.4 with a significant female preponderance. The mean age reported in their study was 52.8 years. They observed that 66.7% of patients with obstructive jaundice belonged to the age group of above 50 years. INR was reported to be deranged in 20% of patients. Amongst the liver function tests, the serum levels of total bilirubin ranged from 7.1 to 24.2 mg% (mean level: 14.2 mg%), conjugated bilirubin levels ranged between 3 to 17.6 mg% (mean level: 10.2 mg%) and ALP levels ranged from 200 to 2850 IU/L (mean level: 900 IU/L). They hypothesized that deranged INR and increased risk of bleeding may be because of decreased production of Vitamin K-dependent clotting factors due to back pressure and endotoxemia. They also noted that the risk increased with age and the decline in the synthesis of the clotting factors and clearance of gut-derived endotoxins may be due to the ageing liver as well.

Mangam et al. [11] conducted their study on 108 patients of obstructive jaundice and reported that the most affected age group was 51 to 60 years, with a female to male ratio of 1.2:1. Jaundice (100%) and pain in the abdomen (68.86%) were the commonest symptoms.

In the study by Shukla *et al.* [12], obstructive jaundice was found to predominantly affect patients aged more than 40 years (77%) with a significant female preponderance (61%). Pain in abdomen (97%), jaundice (81%) and itching (47%) were the commonly reported presenting symptoms, while fever (15%), vomiting (13%) and ascites (7%) were the least common presenting symptoms. These findings were almost similar to the present study.

Sri TL and Chaitanya [13] included 67 patients of obstructive jaundice to assess the clinical profile. They reported that patients aged more than 55 years were the most affected, constituting 56.7% of the patients. However, they reported a slight male preponderance in their study (55.20%). Jaundice (97.01%) was the commonest symptom. These findings were almost similar to the present study.

The female preponderance may be attributed to their higher susceptibility to gallstones, which are strong risk factors for the development of benign and malignant diseases in addition to being an independent contributor to obstruction [14,15].

Amongst the liver enzymes, serum levels of SGOT change in response to the ongoing inflammation and hepatocellular necrosis, while SGPT levels change according to the synthesis pattern. Therefore, SGOT changes reach peak faster and then decline once the condition is resolved, while SGPT changes are comparatively slower. The study by Hayat JO et al has shown that in patients diagnosed with obstructive jaundice, especially due to gallstones, the rise in SGOT may be equal or even higher than SGPT [16].

The decrease in mean levels of protein and albumin found in the present study may be because the liver is the primary organ for the synthesis of most of the plasma proteins, except immunoglobulins. Albumin levels are an indicator of the synthetic function of the liver. They are decreased in hepatocellular jaundice due to decreased hepatocyte function, which may be due to hepatocyte necrosis in viral hepatitis. They are also decreased in obstructive jaundice due to the outflow obstruction for the synthesized product [17].

CONCLUSIONS

Obstructive jaundice may have a varied aetiological spectrum, but assessment of the clinicopathological spectrum may aid in maintaining a high index of suspicion and exclusion of another differential diagnoses.

The findings of the present study suggest that obstructive jaundice generally presents in the elderly age group of 61 to 70 years and has a female preponderance. Abnormal/clay-colored stools, yellowish discoloration of skin and sclera, pain in the abdomen and pruritus are the most common presenting symptoms. The liver enzymes (SGOT, SGPT and ALP) show multi-fold increase in the cases of obstructive jaundice, while serum proteins are invariably decreased. Thus, it is recommended that patients presenting with this profile be assessed for the presence of obstructive jaundice and workup for surgical treatment instituted at the earliest to decrease the associated morbidity and mortality.

LIMITATIONS

The present single-centre study was limited by the OPD attendance of patients having obstructive jaundice. Hence, the results may not be generalized.

CONTRIBUTION OF AUTHORS

One author has only contributed to this article.

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