



EVALUATION OF OBSTRUCTIVE JAUNDICE: A RETROSPECTIVE AND PROSPECTIVE STUDY- AT A TERTIARY CARE CENTRE

General Surgery

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ABSTRACT

Background: Jaundice is a frequent manifestation of biliary tract disorders and poses diagnostic and therapeutic challenges to general surgeons . Early investigation to elucidate the precise aetiology is of great importance as it decides the treatment offered and subsequent prognosis.

Objective: To determine the clinical, biochemical and radiological spectrum of obstructive jaundice at our setup.

Method: 80 elected cases of surgical obstructive jaundice from Sep 2016 to Aug 2018.

Data selection: Prospective and Retrospective study.

Data source: Patient with jaundice attending Command Hospital (EC), Kolkata.

Results: Of the 80 patients 37 are benign and 43 are malignant. The benign case was highest in 5th decade (41-50) yrs whereas in malignant cases highest in 6th decade (51-60) yrs. youngest 16 years old girl and oldest 91 yrs old lady. Mean age 50.81 yrs for benign vs. 57.02 yrs for malignant. The incidence of obstructive jaundice in female was higher both in benign and malignant disease. CBD stone in benign whereas CAGB in malignant very common in our eastern zone. LFT which showed high serum bilirubin and ALP. Serum bilirubin higher in malignant disease than benign. Most common post operative complication is respiratory infection (11.62%) in malignant and (8.10%) in benign.

Interpretation and Conclusion: Obstructive jaundice in our setting more prevalent in female both benign and malignant and cause is mostly CBD calculus in benign and CAGB in malignant. The result of this study suggests that early diagnosis and treatment plays an important role in the prognosis of patients with obstructive jaundice.

KEYWORDS

ALP- Alkaline Phosphatase, CBD- Common Bile Duct, CAGB- Carcinoma Gall Bladder, CA – Carcinoma, LFT-Liver Function Test.

INTRODUCTION:

Jaundice is a generic term for the yellow pigmentation of skin, mucus membranes, or sclera that is caused by heterogeneous group of disorders. ^[1]The predilection for sclera is due to the abundance of elastin, which has a high affinity for bilirubin. Obstructive jaundice is strictly defined as a condition occurring due to block in the pathway between the site of conjugation of bile in liver cells and the entry of bile into the duodenum through the ampullae ^[2] Obstructive jaundice is not a definitive diagnosis and early investigation to elucidate the precise aetiology is of great importance as it decides the treatment offered and subsequent prognosis. The common aetiologies of obstructive jaundice have been reported to vary from one centre to another and from one individual to another. An accurate diagnosis can usually be made with standard diagnostic techniques such as history, physical examination, and biochemical tests, and when appropriate cholangiography and liver biopsy and observation of the patient's course. ^[3]Early detection of obstructive jaundice aetiology can help clinicians to treat accurately and thus will improve quality of life of the patient and particularly the survival rates among the malignant pathology.

Data Statement - Patient And Method:

This was a prospective and retrospective study of patients with a clinical; biochemical and radiological spectrum of obstructive jaundice were evaluated after admission to the surgical wards of Command Hospital (EC), Kolkata over a 2 years period between Sep 2016 to Aug 2018. It is a Medical College and teaching hospital under the West Bengal University of Health Sciences and it is situated in Kolkata city in eastern zone of India. It is a referral centre for tertiary specialist care for eastern zone of India .During this study, all patients who were admitted to the surgical wards of Command Hospital with a clinical diagnosis of obstructive jaundice were, after informed written consent, consecutively recruited into the study. Patients with medical jaundice were excluded from the study. Ethical approval to conduct the study was obtained from the Command Hospital /WBUHS joint institutional ethic review committee before the commencement of the study. All the patients were subjected to detailed history, clinical examination, laboratory investigations which included the Liver Function tests to see the bilirubin level and the level of serum alkaline phosphatase and ALT and AST. Other laboratory investigations included CBC, Prothrombin Time, Serum creatinine and Albumin. Abdominal Ultrasound was the only diagnostic imaging done in all patients to look for the abnormality of intra and extra-hepatic biliary

channels, the common bile duct and presence of causative factors like gall stones, tumours, or any abdominal mass. Advanced diagnostic imaging such as CT scan abdomen, ERCP, and MRCP also were done when applicable .The patients were assessed preoperatively, intraoperatively and postoperatively, and the findings were recorded in a pre tested structured questionnaire. Details that were recorded included patients' biodata, Clinical features, duration of jaundice, cause of obstructive jaundice, laboratory finding ,Ultra-Sonographic /ERCP/MRCP/findings, treatment modalities, intra-operative findings, post-operative complications, length of hospital stay and mortality. Preoperative preparations included maintaining good hydration and administration of antibiotics, and Vitamin K injections. In anaemic patient's blood transfusion was also carried out. The nature of surgical procedure carried out depended upon the cause and the findings at the time of surgery. Patients were followed up till discharge or death. Categorical variables will be expressed as number of patients and percentage of patients and compared across the groups using Pearson's Chi Square test for independence of attributes. Continuous variables will be expressed as Mean $\pm$ Standard Deviation and compared across groups using unpaired t test/One Way ANOVA if the data follows normal distribution and Mann-Whitney U test/Kruskal Wallis test if the data does not follow normal distribution. The statistical software SPSS version 20 will be used for the analysis. An alpha level of 5% has been taken, i.e. if any p value is less than 0.05 it will be considered as significant. The initial assessment regards the detailed history & examinations. The history is in details with regards to onset, duration, progress, weight loss, pain, cholangitis, and lump. The clinical examination gives a detailed evaluation with regards to palpable gallbladder, lump abdomen, ascites, and metastatic spread. After the clinical diagnosis has been made, the appropriate investigations were done serially.

Study Population: All patients diagnosed and managed as case of obstructive jaundice at CH (EC) irrespective of age group will be in study population of jaundice.

Sample Size: Number of patients (approx -50) encountered during the study period.

Sampling Technique (study Design): Prospective and Retrospective study.(observational Study)

Inclusion Criteria: Patients of all age group with history or

symptomatology suggestive of obstructive jaundice.

Exclusion Criteria:

- (i) Patients presented with jaundice due to bile duct stricture (iatrogenic).
- (ii) Patients with known HBsAg infection & jaundice were excluding from the study criteria.

Study Duration: Sept 2016 to August 2018.

Primary And Secondary Outcome : All the available diagnostic tool for early diagnosis and precise aetiology could be made and possible treatment should be started early. And secondary impact is that less hospital stay and best possible outcome.

Strengths:

1. This study helps us in day to day practicing, How to diagnose and early management improve patient prognosis.
2. Enable comparative analysis, identification of common processes and outcome.
3. Large number of data collection

Limitations:

1. Single institutional study not a multicentre analysis.
2. Conflicts arising from cultural bias and other personal issues
3. Patient motivation for diagnosis and treatment.

Sample Size:

n (sample size) = $z_{\alpha}^2 p(1-p)/e^2$ where p is proportion, e is precision here $\alpha = 5\%$ hence $z_{\alpha} = 1.96$ p = Prevalence taken at 5/1000, $e = 2\%$ n is coming as 48. Hence we've decided to take 50 patients in the study.

RESULTS:

The maximum patients with benign aetiology were in their 5th decade from 41-50 yrs, 11 patients out of 37(29.73%) and patient with malignant aetiology were in the 6th decade age group from 51-60yrs, 17 out of 43(39.53%). So the disease prevalence earlier in benign age group as compare to malignant. In benign disease 15 (40.54%) patient was male and 22 (59.24%) patient are female, the ratio of M: F - 1:1.46 (Figure 1).

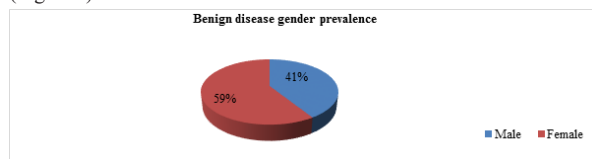
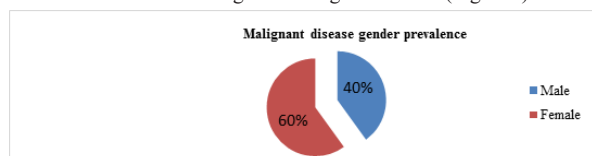


Figure 1. Gender Prevalence (benign).

However in malignant disease 17 (39.53%) patients are male and 26 (60.46%) patient are female. The ratio between male and female in malignant disease M: F-1:1.52. So the gender prevalence is more in female than male both benign and malignant disease (Figure 2).



Figure–2. Gender Prevalence (malignant).

Aetiology:

Total 37 patients are benign. These groups included CBD calculus 34, Ch.Pancreatitis 1, Mirizzi's syndrome 1, Choledochal Cyst 1, In benign disease CBD calculus is the commonest cause of obstructive jaundice. Total numbers of malignant patients are 43, of which 17 (39.53%) are male and 26(60.46%) are female Malignant causes are CAGB, Periapillary CA Cholangiocarcinoma, CA Pancreas. The commonest case is CAGB and least is CA Pancreas. Regarding symptoms - 35(94.59%) patients with benign disease while 32 (74.41%) with malignancy had history of clay coloured stools.

Pruritis was present in total 56 patients (70.0%). In benign disease 26(70.27%) and malignant disease- 30(69.77%). Anorexia was present total 60 (70.00%) patients. In benign disease, it was 24(64.86%) and in malignant condition it was 36(83.72 %). Pain abdomen was present total 51 patients. In benign disease, it was 30(81.08 %) and in

malignant disease it was 21(48.8 %). Scratch marks was present 48 patients among 17 patients (45.94%) being category, and 31 patients (72.09%) are malignant. Abdominal mass was present total 29 patients. In benign disease, it was 5(13.51 %) and in malignant disease it was 24(55.81%). Weight loss was present in 35 patients. In benign disease, it was 4(10.81 %) and in malignant disease it was 31(72.09 %). The common clinical features between benign and malignant diseases are also compare in (Figure 4).

Symptoms	Benign(SOJ)	Malignant(SOJ)	Total
Jaundice	37(100%)	43(100%)	80
Pruritis	26(70.27%)	30(69.76%)	56
Clay colour stool	35(94.59%)	32(74.41%)	67
Pain abdomen	30(81.08%)	21(48.83%)	51
Anorexia	24(64.86%)	36(83.72%)	60
Fever	7(18.91%)	1(2.32%)	8
Vomiting	14(37.83%)	11(25.58%)	25
Scratch mark	17(45.94%)	31(72.09%)	48
Lump abdomen	5(13.51%)	24(55.81%)	29
Weight loss	4(10.81%)	31(72.09%)	35

Figure 4. Comparisons (Clinical Features).

Fever was present total 8 patients. In benign disease, it was 7(18.92%) and in malignant condition it was 1(2.33 %). Vomiting was present total 25 patients. In benign disease, it was 14(37.84%) and in malignant condition it was 11(25.58%). Total 40/80 patients are in the persistent elevation of jaundice, among them 30(81.08%) patients for benign and 10(23.26%) patients for malignant disease. So persistent elevation of jaundice is more suggestive of benign disease. Progressively increasing jaundice 38/80 patients among them 6(16.22%) for benign and 32(74.42%) patients for malignant disease. So progressively increasing jaundice more favours of malignant disease. Total 4/80 patients are in the fluctuating of jaundice among them 2(2.5%) patients for benign and 2(2.5%) patients for malignant disease. So fluctuating of jaundice is equally risk for benign as well as malignant disease (Figure 3).

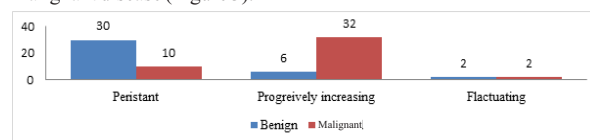


Figure 3. Progression Of Jaundice.

Duration of symptoms of jaundice 20/37(50.05%) in benign disease between (4-8) weeks. Maximum number in benign disease fall in this group and least in 3-6 months. Similarly in malignant disease 18/43(41.86%) is in 2-4 weeks are the maximum and least in >6 months. The level of serum bilirubin is maximum 16/37 (43.24%) patients are serum bilirubin <8 mg/dl and least in 10/37(27.03%) patients serum bilirubin 8-12 mg/dl.

However in malignant disease maximum 22/43(41.25%) patients, the level of bilirubin is >12 mg/dl and least 5/43(11.63%) patients are serum bilirubin < 8 mg/dl. So serum bilirubin higher in malignant disease than benign disease.

14 patients out of 37 (37.84%), are being found in maximum serum Alkaline Phosphatase level in the range 131-300U/L. Similarly in malignant disease the serum level maximum found 14 patients out of 43(32.56%) in the range 301-600U/L. In benign disease maximum number of patient 22(65.12%) having PT in between 12-13.99 and least 1 patient (2.70%) having PT >16 Sec. Similarly 28 patient in malignant disease PT in between (12-13.99) sec and least 4 patients (9.3 %) PT is (14-15.99) sec. So PT is maximum in malignant disease than benign disease. Highest level of serum albumin found 4.7 gm/dl as compared to 4.9 gm/dl in malignant disease. Similarly lowest level of serum albumin is 2.2 gm/dl in benign disease than malignant disease 2.1 gm/dl. Thus average serum level in benign disease is 3.45gm% which is close to 3.5 mg% of malignant disease. USG is helpful to diagnosed only 14/37 (37.83%) patients in CBD calculus and only one patient of chronic pancreatitis whereas at operative / intervention all the benign disease are diagnosed. 1. CECT did in benign 12/37(32.43%) patients and malignant 30/43 (69.77%) patients 2. MRCP did 8(21.62) patients benign and 9(20.93%) patients for malignant disease. 4. ERCP did 31(91.89%) patients out of 37 patients for benign disease. 5. Triple bypass surgery 5/43 malignant patients, 6. Stenting inserted 5 patients in benign and 6 patients in malignant. Palliative treatment done for

malignant disease 32/43(79.07%) patients. There are total 37 patients of benign disease managed in various modalities.

Lap cholecystectomy in 22 patients and Lap converted to open cholecystectomy 8 patients and open cholecystectomy only 2 patients, ERCP done 31 benign patients and stenting done in 6 patients. However contradictory to malignant disease maximum patient managed by palliative PTBD (22), Pigtail drainage (4), Stenting (6), Triple bypass surgery (5) and Whipple's procedure (6).

Complication in benign disease was respiratory infection (3) Renal insufficiency (1), and Wound infection (1). Whereas complications due to malignant disease are Sepsis (2), Renal insufficiency (2), Respiratory tract infection (5), Wound infection (1), Biliary leakage (2). Post op morbidity was present total 20(25.00%) patients. In benign disease it was 5/37(13.51%) and in malignant disease it was 15/43(25.58%). However 32(86.49%) patients among benign and 28(65.12%). It signifies that patient morbidity more in malignant disease than benign disease. Post op mortality among benign disease due to renal failure only one patient, whereas maximum number of patient died due malignancy (28), Renal failure (2), Sepsis (2), and biliary fistula (1) Mortality in malignant patients: 33/43 (76.74%). Mortality in benign patient: 1/37 (2.70%). Follow-up 6 months - total 36 patients, in benign disease - 34(94.44 %) patients and malignant disease - 10(62.50%) patients. However 2(5.71%) patients among benign disease and 6(15.38%) patients among malignant disease lost their follow up.

DISCUSSION:

Obstructive jaundice is a frequent condition of biliary tract disorders and the evaluation and management of the jaundice patient is a common problem facing the General Surgeon. While diagnosing a case of surgical jaundice, a thorough history, a complete physical examination and biochemical tests are necessary. Total number of cases was 80. The results were compared with other similar studies done by various author. In this study, the peak incidence of surgical jaundice in benign disease was seen in age group of 44-54 years (29.73%). Whereas in malignant cases age group are 55-64yrs (39.53%). So the disease prevalence earlier in benign age group as compare to malignant. In our study - The mean age of the patients with the benign or malignant aetiology of obstructive jaundice was 50.81 years and 57.02 years respectively. Most of the patients with the benign jaundice were between 45-54 years of age while malignant causes were more common in the older patients and were maximally seen between 55-64 years of age. It is suggestive that jaundice is more prevalent in benign age group earlier than malignant age group.

The increased incidence of malignant obstructive jaundice with the increasing age has also been reported by Muzaffar Aziz et al. Another study by Gupta AK et al. Int Surg J. 2017 Feb; 4(2):743-46. We observed that mean age of patients of benign and malignant cases of obstructive jaundice was 42.7 years and 68.5 years respectively. More than 50% cases were in the age group of 55-75 years. Two studies from Nigeria and Tanzania found that the patients with malignant causes of obstructive jaundice were older than the patients with benign causes of obstruction.^[4] Anand S et al 3 evaluated the clinical profile and the different modalities of treatment of obstructive jaundice and revealed that occurrence of surgical jaundice was maximum in the 31- 70 year age. In this study Gender: Benign - Male patient was 15 (40.54%). Female patient was 22(59.24%) and ratio M: F 1:1.4. Whereas in Malignant - Male patient was 17 (39.53%), Female patient was 26 (60.46%), ratio M:F 1:1.52. So gender prevalence is more in female than male both benign and malignant obstructive jaundice. In this study, both the benign and malignant obstructive jaundice were found to be more common in females than in males, which is in conformity with the results of other researchers.^[5] Most of the literature suggested that the most common cause of obstructive jaundice were malignant cause compare to benign causes but in contrast to Bekele et al.^[6] In Ethiopia who reported benign obstructive jaundice (choledocholithiasis) as the most common cause of obstructive jaundice. In our study, choledocholithiasis was the commonest cause followed by malignant cause obstructive jaundice. Sharm & Ahuja reported carcinoma of the gall bladder as the most common cause of malignant obstructive jaundice.^[7]

In our study choledocholithiasis is the most common cause of benign obstructive jaundice and CAGB is the most common cause of malignant cause of obstructive jaundice. The common presentation in

a benign condition was pain abdomen, clay colour stool, vomiting whereas in malignant condition it was loss of appetite, pruritis, scratch mark, abdominal mass, and weight loss. Malignant cases had icterus and a palpable gallbladder when compared to benign condition. These conditions also carried an increased risk for malignancy as calculated by the odds ratio. In the current study it was observed that jaundice (100%), pain abdomen (81.08%) weight loss (10.81%) were three most common modes of presentation of obstructive jaundice cases. This result correlates with study conducted by other study.^[8] Clay coloured stool, weight loss and palpable abdominal mass were more common in malignant obstructive jaundice, whereas right upper abdominal pain was more common in benign obstructive jaundice. Pruritis and scratch marks were seen equally in both the benign and malignant cases. Similar clinical pattern was also reported by others study.^[9] In our study benign disease- most common presentation Jaundice (100%), Clay colour stool (91.59%), Abdominal pain (81.08%), Pruritis (70.27%), Anorexia (64.86%), Scratch mark, (45.95%). In malignant disease more common presentation Jaundice (100%), Anorexia (83.72%), Clay colours stool (74.42%), Scratch mark (72.09%), Pruritis (69.77%), Abdominal mass (55.81%). Among the symptoms, clay colour stool were 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 choledocholithiasis. The abdominal mass was appreciated in 24/43(55.81%) of the patients with malignancy due to the local spread of tissues and no mass was palpable in cases of choledocholithiasis or any other benign condition thus supporting the 'Courvoisier's law'.^[10] The scratch marks were seen in equal percentage of patients amongst the benign and malignant conditions.^[11] The presence of these signs and symptoms has also been confirmed by other studies. (Figure-5)

SYMPTOMS	Agarwal et	Nadkarni	Present study
ICTERUS	100%	100%	100%
PAIN ABDOMEN	79.1%	53.8%	81.08%
ITCHING	50%	73.1%	70.27%
FEVER	12.5%	53.8%	18.91%
NAUSEA/VOMITING	70.9%	88.5%	37.83%
CLAY COLOUR STOOL	41.7%	92.3%	94.00%

Figure 5. Common Clinical Features In Different Trial.

^[12] There were significantly higher values of total bilirubin, direct bilirubin and alkaline phosphatase in malignant conditions. It was found that obstructive jaundice secondary to common bile duct stones remains the commonest cause, obstructive jaundice secondary to malignancy. CAGB is the commonest cause among malignant disease. 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 analysed for benign and malignant cause.^[13] Sonographic scanning of the biliary ducts has been used successfully as a screening test to distinguish between surgical and medical jaundice with an accuracy of 90%.^[14] However, although it is well suited to visualize the common hepatic duct and proximal CBD, one of its major limitations is assessment of the distal CBD and pancreas, which are often obscured by overlying bowel gas in about 30-50% of the patients.^[15] USG is helpful to diagnosed only 14/37(37.83%) patients in CBD calculus and only one patient of chronic pancreatitis whereas at operative intervention all the benign disease are diagnosed. USG abdomen was carried out on all patients as a standard imaging technique for investigation on a patient presenting with jaundice. USG was successfully used as a cheapest non-invasive tool to know the cause and level of obstruction in nearly 93% of the patients (USG was unable to diagnose one benign CBD stricture, which was diagnosed by ERCP). The limitation of this study was unable to diagnose one benign CBD stricture, which was diagnosed by ERCP. ERCP was done 34 (91.89%) patients out of 37 patients for benign disease. In our study MRCP done 8(21.62%) patients benign and 9(20.93%) patients for malignant disease MRCP is a non-radiating, non-invasive and yet a highly sensitive method of investigating obstructive lesions of the biliary tract.^[16] It is accurate and thus increasingly accepted means of imaging pancreatobiliary diseases. MRCP permits evaluation of the pancreatic biliary tract, and gallbladder without the use of contrast material and is thus preferred in patients where use of contrast is restricted or contraindicated. It has a sensitivity of 95% and specificity of 95% for demonstrating the level and presence of biliary obstruction.

^[17]In our study, MRCP was able to detect the level and presence of obstruction in 100%. A meta-analysis summarizing 43 studies has shown that sensitivity of MRCP for detecting the presence (99%) and level (99%) of biliary obstruction was more as compared to that for diagnosing stones (92%) and for differentiating benign from malignant obstruction (85%). ^[18]Early detection of obstructive jaundice aetiology can help clinicians to treat accurately and thus will improve quality of life of patient and Hence, present study was undertaken to evaluate the aetiology, clinical presentation, biochemical and radiological methods employed for diagnosis in patients of obstructive jaundice reporting at command hospital (EC).

CONCLUSION:

Obstructive jaundice in our setting more prevalent in female both benign and malignant and cause is mostly CBD calculous in benign and CAGB in malignant. The result of this study suggests that early diagnosis and treatment plays an important role in the prognosis of patients with obstructive jaundice. Early investigation to elucidate the precise aetiology is of great importance as it decides the treatment offered and subsequent prognosis.

Author's Contribution :

PLC conceived the study and did the literature search, coordinated the write-up, editing and submission of the article. ESK and MM participated in the writing of the manuscript and editing. All the authors read and approved the final manuscript.

Conflicts Of Interests:

There is no conflict of interest, and. All authors are in agreement with the manuscript. The publication has not been published before and is not under consideration elsewhere.

The Disclosure Statements:

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