Aetiological Spectrum and Management Strategies of Obstructive Jaundice in a Tertiary Care Hospital

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ABSTRACT

Background: Obstructive jaundice is a common problem in surgical and gastro-enterological practice. Cause of obstruction is heterogeneous that includes both benign and malignant conditions. Management also varied according to pathology and level of obstruction.

Objective: To identify the causes of obstructive jaundice and management techniques employed in those cases in Dhaka combined military hospital.

Methods: This prospective observational study was carried out in the department of hepatobiliary and pancreatic surgery of Dhaka combined military hospital. Sample size of the study was 96. Entry of the various variables of the each clinical data were done and were analyzed by computer based program SPSS (Statistical Package for Social Science, version 25.0). Means of the continuous variables of the groups were compered by Independent sample t test and nominal variables were compered by Chi square test.

Results: Mean age of the study population was 55.11 years. Mean age of malignant cases was about 10 years more than benign cases (60.19 years vs 51 years). Choledocholithiasis was the most common (42.7%) benign cause of obstructive jaundice, whereas periampullary carcinoma (12.5%), carcinoma head of pancreas (10.4%) and cholangiocarcinoma (10.4%) were three most common causes of malignant obstruction. Choledocholithiasis was managed mostly by ERCP (48.78%) and open surgery (39.02%). 100% cases of periampullary carcinoma were managed by curative surgery, whereas only 40% cases of carcinoma head of pancreas and 20% cases of cholangiocarcinoma were managed by curative surgery.

Conclusion: Choledocholithiasis was the most common benign etiology that particularly inflicts in younger age group. Malignant etiology was causing obstruction in older age group. ERCP is the first line of management in choledocholithiasis.Curative surgery was almost always possible in case of periampullary carcinoma.

Keywords: Aetiology, Obstructive jaundice, Choledocholithiasis, Perampullary carcinoma, Carcinoma head of pancreas, Cholangiocarcinoma, Management strategy.

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INTRODUCTION

Jaundice is a common problem in day to day surgical practice.[1] Obstructive Jaundice is caused by pathologies causing obstruction to the passage of conjugated bilirubin from liver cell to intestine.[2] Cause can often be correctly anticipated from the clinical circumstances but investigations are usually required for confirmation.[1] Jaundice due to biliary obstruction may be caused by both benign and malignant conditions.[3] The common causes of obstructive jaundice have been reported to vary from centre to centre and individual to individual.[3] The clinical manifestations are dependent on cause as well as completeness of obstruction and they include the increasing jaundice and abdominal pain for several days followed by waxing and waning of pain and jaundice in case of CBD stone and jaundice for several weeks with unremitting symptoms, darkening of urine, anorexia, weight loss and malaise are related to malignancies.[4]

Ultrasonography is still the first-line imaging modality in obstructive jaundice due to its wide availability, low cost and and non-invasiveness, MRCP offers a complimentary role with high sensitivity for biliary tract disease such as stones, strictures and malignancies.[5] MRCP is the modality of choice for optimal characterization of the obstructive pathology in most of the cases of obstructive jaundice. MRCP was superior to USG and CT scan or ERCP in studying the malignant lesions.[6]

ERCP is a reliable method in treating obstructive jaundice in most of the benign conditions and stenting as a palliative measure in malignant obstruction.[7] Some of the common causes of obstructive jaundice can be very effectively treated by surgery hence sometimes it's referred to as surgical jaundice. Results of surgery in some of these cases are amazing.[8]

MATERIALS AND METHODS

This prospective observational study was carried out in the department of Hepatobiliary and Pancreatic surgery of CMH Dhaka from January 2022 to December 2022. Total sample size was 96. Ethical clearance of the study was obtained from institutional ethical board.

Detailed history of the patients along with demographic details was noted down. A complete general and systemic examination was done. All the patients were studied with respect to the presenting complaints and signs. Routine investigations like blood group, complete blood count, liver function tests, kidney function tests, blood sugar level, Liver function tests and coagulation profile was done in all the cases. Ultrasonography was done in all the cases. Other investigations like, Magnetic resonance cholangio-pancreatography (MRCP), Contrast enhanced Computerized Tomography (CECT) of abdomen and Endoscopic retrograde cholangio-pancreatography (ERCP), were done in selected cases.

Aetiology of the obstructive jaundice was determined on the basis of imaging. Appropriate treatment options were employed in the form of curative, palliative, supportive or conservative approach. Procedures were either endoscopic, percutaneous or open surgical.

Treatment options were chosen basing on aetiology (benign or malignant), level of obstruction, severity of jaundice, resectibility of the lesion and operability of the patient.

Entry of the various variables of the each clinical data were done and were analyzed by computer based program SPSS (Statistical Package for Social Science, version 25.0). Descriptive statistics were presented as mean with standard deviation. Grouping of the certain variables were done using transform code of SPSS. Means of the continuous variables of the

groups were compered by Independent sample t test and nominal variables were compered by Chi square test. P value of less than .05 was considered statistically significant, Results were presented by tables, graphs and charts.

RESULTS

The total number of patients with obstructive jaundice was 96. Mean age of the study population was 55.11 years (Rang: 25-82). Among them 64 (66.67%) were male and 32 (33.33%) were female with a ratio of 2: 1, Mean age of male and female were 57.19 and 50.97 years respectively (p=.025) (Table 4.1). Mean age of the patient with Benign and malignant pathology were 51.00 and 60.19 years respectively (p=.000) (Table-I).

Most (29/53) (54.7%) of the patient with benign pathology were from age group 35-54, whereas most (30/43) (69.76%) of the patient with malignant pathology wee from age group 55-74. Only 01 of 43 patients with malignant pathology had age less than 44 years. Overall most common age group of obstructive jaundice was 55-64 years and second most common age group was 45-54 years (P=.000) (Table-II).

Benign pathology was more common in male (60.94% vs 39.06%) whereas malignant pathology was more common in female (43.75% vs % 56.25%), but the difference was not statistically significant (p=0.11) (Table-III).

In this study, 53 (55.1%) cases were of benign and 43(44.9%) cases were of malignant etiology. Among benign cases choledocholithiasis was most common (42.7%), followed by post cholecystectomy biliary stricture (3.1%), pancreatitis (3.1%), papillary stenosis (2.1%), pancreatic pseudo-cyst (1%) and biliary ascariasis (1%). Among malignant cases, Periampullary Ca (12.5%), Ca head of pancreas (10.4%), Cholangiocarcinoma (10.4) were most common followed by Ca Gall bladder (9.4%) and local recurrence of previously operated cancer with lymph-adenopathy at porta hepatis (2.1%)(Table-IV)(Figure-I).

Management of benign cases was summarized in Table-V. Choledocholithiasis was managed mostly by ERCP (20/41, 48.78%) and open CBDE (16/41, 39.02%). Other 05 cases (12.20%) were managed conservatively. Out of 20 cases 14 were managed with stenting and 06 without stenting. Among 16 open CBDE cases 12 were managed with T-tube drainage and 04 without T-tube drainage. All post cholecystectomy BDI cases were managed by HJ. Out of 03 pancreatitis cases 02 were managed conservatively and another by PTBD after failed ERCP. Out of 02 stent related complication cases 01 (displaced stent) was managed by ERCP and other (fragmented stent with multiple stones was managed by HJ. Biliary ascariasis, pancreatic pseudo-cyst and papillary stenosis cases were managed by ERCP. ERCP was not attempted in 09 cases (16.98%). 07 of them were managed conservatively whereas in 02 cases of post cholecystectomy bile duct injury, it was not indicated. It was the plastic stent that were used in benign cases. Choledochal cyst was managed by total excision of cyst with HJ.

Management of malignant cases was summarized in Table-VI. All 12 periampullary carcinoma cases were by managed by curative surgery (02 by PD and 10 by PPPD). Out of 10 Ca head of pancreas cases 04 (40%) were managed by curative surgery (PD), 05 (50%) by palliative procedures (03 by endo-biliary stenting and 02 by PTBD) and 01 case by supportive treatment. Out of 10 cholangio-carcinoma cases 02 (20%) were managed by curative surgery (one by RE+HJ and another by PD), 06 (60%) by palliative procedures (03 by endo-biliary stenting and 03 by PTBD) and 02

cases by supportive treatment. Out of 09 Ca Gall bladder cases, 03 (33.33%) cases were managed by curative surgery, 04 (44.44%) by palliative procedures (02 by endo-biliary stenting and 02 by PTBD) and 02 cases by supportive treatment. Post-operative local recurrence cases were managed by endo-biliary stenting and PTBD.

TABLE-I: Mean Age of patients as per sex and pathology (n-96)

		N	Mean age in years	Std. Deviation	P value
Sex of the patient	Male	64	57.19	12.221	.025
	Female	32	50.97	13.446	
Type of Pathology	Benign	53	51.00	14.085	<0.001
	Malignant	43	60.19	9.155	

TABLE-II: Case distribution according to age group (n-96)

		Type of obstruction		Total	P value
		Benign	Malignant		
Age group	25-34	5	0	5	<0.001
	35-44	16	1	17	
	45-54	13	9	22	
	55-64	9	21	30	
	65-74	7	9	16	
	75-84	3	3	6	
Total		53	43	96	

TABLE-III: Sex distribution of the cases (n-96)

				Total	P value
		Benign	Malignant		
Sex of the patient	Male	39	25	64	0 .11
	Female	14	18	32	
Total		53	43	96	

TABLE-IV: Etiological distributions of the cases (n-96)

		Frequency	Percent	Cumulative percent
Benign	Biliary ascariasis	01	1.0	1.0
	Choledocholithiasis	41	42.7	43.7
	Pancreatic pseudocyst	01	1.0	44.7
	Pancreatitis	03	3.1	47.8
	Papillary stenosis	01	1.05	48.85
	Choledochal cyst	01	1.05	49.9
	Post cholecystectomy bile duct injury	03	3.1	53.0
	Stent complication	02	2.1	55.1
	Total	53	55.1	
Malignant				
	Carcinoma Gall bladder	09	9.4	9.4
	Carcinoma head of pancreas	10	10.4	19.8
	Cholangiocarcinoma Hilar Mid CBD Distal	10 07 01 02	10.4	30.2
	Local recurrence with lymphadenopathy	02	2.1	32.3
	Periampullary carcinoma	12	12.5	44.9
	Total	43	44.9	

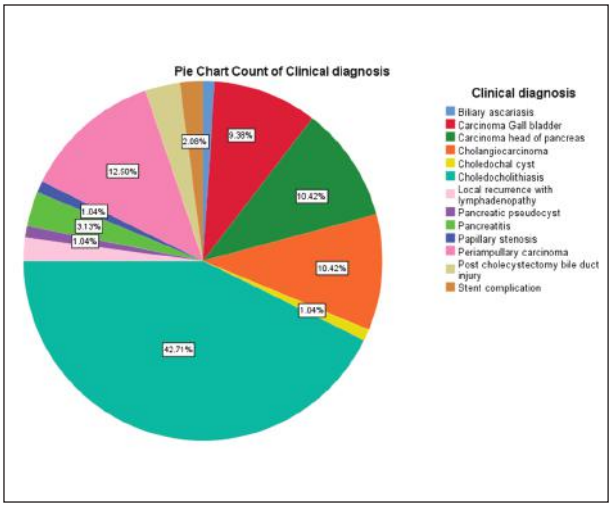

Figure-1: Etiological spectrum of cases

TABLE-V: Treatment given to Benign Cases (n-53)

		Con	ERCP-stenting	ERCP + stenting	Open Surgery			PTBD	Total
					HJ	CBDE + T	CBDE-T		
Diagnosis	Biliary ascariasis	00	01	00	00	00	00	00	01
	Choledocholithiasis	05	06	14	00	12	04	00	41
	Pancreatic pseudocyst	00	00	01	00	00	00	00	01
	Choledochal cyst	00	00	00	01	00	00	00	01
	Pancreatitis	02	00	00	00	00	00	01	03
	Papillary stenosis	00	00	01	00	00	00	00	01
	Post cholecystectomy BDI	00	00	00	03	00	00	00	03
	Stent complication	00	00	01	01	00	00	00	02
	Total	07	07	17	05	12	04	01	53

Note: Con- Conservative, HJ- Hepatico-jejunostomy, CBDE+T-Common bile duct exploration with t tube drainage, CBDE-T-Common bile duct exploration without t tube drainage, BDI- Bile Duct Injury

TABLE-VI: Treatment Given to Malignant Cases (n-43)

		Curative				Palliative		Supportive	Total
		RE-HJ	RE+HJ	PD	PPPD	ERCP+ Stenting	PTBD		
Malignant	Ca Gall bladder	01	02	00	00	02	02	02	09
	Ca head of pancrea	00	00	04	00	03	02	01	10
	Cholangio Ca	00	01	01	00	03	03	02	10
	Local rec with LN	00	00	00	00	01	01	00	02
	Periampullary Ca	00	00	02	10	00	00	00	12
	Total	01	03	07	10	09	08	05	43
Grand Total		21				17		05	43

Note: Ca- Carcinoma, Rec- Recurrence, LN-Lymphadenopathy, RE-HJ- Radical excision without hepatico-jejunostomy, RE+HJ- Radical excision with hepatico-jejunostomy, PD-Pancreatico-duodenectomy, PPPD-Pylorus preserving pancreatico-jejunostomy, PTBD-Percutaneous transhepatic biliary drainage.

DISCUSSION

In this study, mean age of the patients was 55.1 years. Khan ZA reported similar mean age (56.68 years) in his study of 201 cases.[9] Rahman MM et al, and S Verma et al reported much lower mean age ((45 years, and 50.4 years respectively).[7,11] Mean age in benign cases was 51 years and in malignant cases 60.19 years. Khurram et al found the mean age of malignant cause to be 56.4 years and the mean age of benign cause to be 42 years.[12] Chalya et al found the mean age of benign cases to be 42.36 years and malignant cases to be 58.64 years.[13] S Verma et al reported mean age of benign cases 38,6 years and mean age of malignant cases was 56.7 years.[11] So difference of mean age of benign and malignant cases by about 10 years or more was a significant finding.

Most of patients of this study were male with a ratio of 2:1. Study conducted by Rahman MM et al, Nilesh P Mangam et al , Khan ZA, and Kurian et al reported the ratio in favour of male but according to other studies ratios were in favour of female.[7,8,9,14.15] In this study, benign pathology was more common in male and malignant pathology was found more commonly in female but the difference was not statistically significant. S Verma et al reported male-female ratio for malignant cases 2.9:1 whereas Das et al in a study of 125 malignant cases reported malignant pathology is more common in male.[11,16] According to Chalya et al both benign and malignant pathology were more frequent in female13 (p<.001).

In this study, cause of obstruction was benign in 55.1% cases and malignant in 44.9% cases. Similar findings were reported by Singh et al (68% vs 32%), Yadav et al (62% vs 38%), Afzal MN et al (54.67% vs 45.33%) Wilku KS et al (62% vs 38%) and Banerjee C et al (58.82% vs 41.18%)[15,19-22] but reverse findings were reported by Khan ZA (41.29% vs 58.71%), S Verma et al (37.27% vs 62.73%),Chalya et al (42.36% vs 58.64%), Bimal CR et al (42% vs 58%) and Gupta AK et al (36.11% vs 63.89%).[9,11,13,17,18] Choledocholithiasis was the most common (42.7%) cause of obstructive jaundice in this study which was supported by Rahman MM et al (32%), Khan ZA (33%), Khurram et al (35%), Singh et al (45.6%), Afzal MN et al (43.3%), Wilku KS et al (46%), Banerjee C et al (43%) and Masum MG (40%).[7,9,12,15,20-23] We

report 03 cases (3.1%) of post cholecystectomy stricture as a cause of obstructive jaundice. All 03 cases were referred to us from other hospitals. Study by Bimal CR et al (8%) Yadav et al (6%), and Wilku KS et al (6.67%) reported much higher rate of post cholecystectomy biliary stricture.[17, 19, 21] Afzal MN et al reported choledochal cyst as the second most common benign cause of obstructive jaundice220. In this study one case was due to biliary parasite, another study from Bangladesh reported 02 cases.[23]

Periampullary carcinoma, Ca head of pancreas and Cholangiocarcinoma were almost equally (12.5%, 10.4% and 10.4% respectively) prevalent as malignant cause which was supported by Wilku KS et al (8%, 8% and 6% respectively).[21] F Salam et al from Bangladesh in her study of malignant cases reported almost equal prevalence of Periampullary carcinoma, Ca head of pancreas and Cholangiocarcinoma (26%, 30% and 28% respectively).[6] In contrast, Khan ZA, S Verma et al, Khurram et al, Chalya et al, Gupta AK et al, Afzal MN et al and Umeshchandra DG et al reported Ca head of pancreas (25%, 30%. 38%, 32%, 38.88%, 26.7% and 40% respectively) as the most frequent malignant cause,[9,11,12,13,18,20,24] whereas Singh et al, Banerjee C et al, and Singh SK et al reported Ca Gall bladder as the most common cause (14%, 38%, and 30% respectively).[15,22,25] Various studies reported cholangiocarcionoma as the second most common malignant cause of obstructive jaundice.[12, 15, 17-20, 24]

In this study, Choledocholithiasis were managed by ERCP (48.73%) open CBD exploration (39.02%%) and conservatively (12.20%). Almost similar management strategy was employed by Afzal MN et al (ERCP-46.18%, CBD exploration (53.84%) but Wilku KS et al reported higher rate of CBD exploration.[20, 21] All choledocholithiasis patient were send to gastro-enterology department for ERCP and stone extraction. Only ERCP failed cases were treated by open CBD exploration. In this study, out of 16 CBD exploration cases 12 were done with T-tube drainage and 04 were done without T-tube drainage. Umeshchandra DG et al performed 08 cases and Singh KS et al performed 20 cases, all of them were with T-tube drainage.[24, 25] In contrast, Chalya et al performed majority of the cases without T-tube drainage, whereas Jan Y et al performed 30 cases without T-tube drainage and 30 cases with t-tube drainage and all three studies found primary closure a safe procedure.[13,27] Yadav et al reported CBD exploration with choledochodudenostomy as commom (40%) procedure of management.[19] Rahman MM et al reported much higher success rate (>94%) in managing choledocholithiasis by ERCP.[7] In this study, 31 cases of choledocholithiasis had associated cholelithiasis (75.6%). Cases which were treated by ERCP underwent routine laparoscopic cholecystectomy during same hospital admission. On the other hand cases which were managed by open CBD exploration, cholecystectomy was done during index surgery. None of the cases was managed by laparoscopic CBD exploration. Guo T et al treated 275 cases by preoperative ERCP followed by laparoscopic cholecystectomy and 280 cases by combined laparoscopic CBD exploration and laparoscopic cholecystectomy. They concluded that both the techniques are equally effective and safe.[28]

All 03 post cholecyetectomy biliary stricture in this study were managed by HJ without stenting and without any complications. Yadav et al manaaged 02 cases by HJ and 01 case by Choledochodudenostomy.[19] A study of 22 cases by Francis Sutherland et al concluded that HJ without stenting is a reliable repair of post-cholecystectomy bile duct strictures.[29]

Less common causes of obstructive jaundice (Papillary stenosis, biliary ascariasis and pancreatic pseudo-cyst) were managed successfully by ERCP in our study. Similar success rate was reported by Rahman MM et al.[7]

Surgery is the only curative treatment option in case of malignant obstructive jaundice. Among 43 malignant cases we provided curative treatment in 21 cases (48.83%), palliative treatment in 17 cases (39.53%) and supportive therapy in 05 cases (11.62%) Afzal MN et al reported curative treament in 22 cases (32.3%), whereas Singh KS et al reported curative treatment in 19.23% cases20, 25,. High rate of curative treatment in this study was possible due to early diagnosis which is attributable to early reporting system in armed forces.

All 12 (100%) cases of periampullary carcinoma received curative treatment (PD-2, PPPD-10). Surgery was determined by surgeon's preference rather than on anatomical basis. Mahalakshmi et al treated 21 cases (84%) by PD, 02 cases by triple bypass, 01 case by double bypass and 01 case by palliative radiotherapy.[30] Singh KS et al managed 02 cases by PD and 02 by PTBD.[25] Umeshchandra DG treated 01 case by PD and 01 case by palliative bypass.[24] None of our cases underwent pre-operative stenting whereas Mahalakshmi et al reported pre-operative stenting in 24% cases.[30] So, curative treatment without pre-operative stenting can be offered in most of the cases of periampulary carcinoma.

Out of 10 carcinoma head of pancreas cases, 04 (40%) received curative treatment in the form of PD, 05 underwent palliative procedures (endobiliary stenting-03, PTBD-02) and 01 patient was treated by supportive therapy.

Out of 10 Cholangiocarcinoma cases, 08 were hilar cholangiocarcinoma (80%) and none of them could be offered curative treatment. They were provided palliative treatment (ERCP and stenting-03, PTBD-03) and supportive therapy (02 cases). 02 other cases received curative treatment (Distal cholangiocarcinoma-PD and Mid CBD cholangiocarcinoma-Radical excision and HJ).

In this study, curative treatment was provided in 03/09 (33.33%) cases of carcinoma gall bladder which is much higher than Singh KS et al (01/15, 6.67%)25.

CONCLUSION

Obstructive jaundice is a common surgical and gastro-enterological problem. Biliary obstruction is caused by heterogeneous groups of disorders. Choledocholithiasis is the most common benign etiology that particularly inflicts in younger age group. Malignant etiology is causing obstruction in older age group. Periampullary carcinoma, carcinoma head of pancreas and cholangiocarcinoma are almost equally common in our institute.

ERCP is the first line of management in choledocholithiasis. It can be managed conservatively in selected cases. Open common bile duct exploration with or without t tube drainage gives excellent results in ERCP failed cases. Curative surgery is almost always possible in periampullary carcinoma cases but in case of other malignant cause curative surgery may not be possible. Endo-biliary stenting and PTBD plays important role in palliation of inoperable cases.

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