

A STUDY OF JAUNDICE IN PATIENTS OF GALLSTONE INDUCED PANCREATITIS AND ITS OUTCOME

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ABSTRACT

Background: The objective is to assess the proportion of patient with jaundice in gallstone induced pancreatitis at the time of presentation. **Materials and Methods:** The study was conducted in the Department of Surgery, over a period of 12 months on 52 patients admitted with a diagnosis of Gallstone induced pancreatitis. The presence of jaundice in such patient was noted and course of jaundice was documented by serial LFT. The proportion of patients that have spontaneous resolution of jaundice was noted along with the time of resolution. If there is persistent jaundice any additional imaging done was recorded. The finding of subsequent treatment of GSIP (viz. cholecystectomy) was also be noted. The follow up period was upto 6 weeks. **Result:** In this study female predominance was high with a male-female ratio of 6:7. Prevalence of jaundice was more in females as compared with males. Majority of the patients belong to age-group 26-50. Majority had distended gall bladder size and multiple stone. More than 50% of jaundiced patients had dilated CBD size and normal intrahepatic biliary radicals. High level of serum amylase, serum lipase, serum bilirubin, Serum ALT and Serum ALP were noted in jaundiced patients. **Conclusion:** It was concluded that majority 61.5% (32) cases of gallstone-induced pancreatitis had jaundice while rest 38.5% (20) of the cases were free from jaundice. Mean time of resolution was 4.25±1.16 days in patients of clinical jaundice.

INTRODUCTION

Gallstones diseases are prevalent all over the world and known as Cholelithiasis. Cholelithiasis prevalence varies by location. According to reports, the prevalence of gallstone disease in Western countries ranges from 7.9% in males to 16.6% in women. The natural history of gallstones has been well documented and it has been observed that cholelithiasis may present primarily with complication such as acute pancreatitis. In asymptomatic persons with gallstones; 1-2 % per year becomes symptomatic, of which 5% presents directly with complication of cholelithiasis such as gallstone induced pancreatitis (GSIP), jaundice and cholangitis.^[1] Among the most frequent complications of gallstone disease is acute pancreatitis.

The primary etiological factor of acute pancreatitis (AP) worldwide is gallstones, which are diagnosed by imaging techniques such as USG, CT scan, MRI with MRCP and substantiated by liver function tests.^[2] The duct is blocked by the gallstone as it migrates, which results in pancreatitis from gallstones. The uncontrolled intra ductal activation of pancreatic digesting enzymes caused by duct obstruction, which raises duct pressure, helps to cause pancreatitis.^[3]

Clinically GSIP presented with ache in the upper abdomen some time radiating to the back is cardinal symptom. Ninety percent of patients also have nausea and vomiting, which is another sign of acute pancreatitis.^[4]

When blood tests reveal jaundice, high levels of serum alkaline phosphatase (ALP), serum gamma-glutamyl transferase (GGT), and serum trans amylase, and a gallbladder stone is seen on ultrasound, the condition is diagnosed as gallstone-

induced acute pancreatitis. There is a purpose for either MRCP or ERCP if ultrasonography has not been able to detect stones in common bile duct, when jaundice and increased enzyme levels are present.^[5] The most popular diagnostic tests for acute pancreatitis continue to be those that measure serum levels of another serum marker, such as amylase and lipase.^[6] This study will attempt to quantify the number of patient that have jaundice when they present with GSIP. The resolution of jaundice will also be assessed.

MATERIALS AND METHODS

The study was conducted in the Department of Surgery, over a period of 12 months. Patients admitted with a diagnosis of Gallstone induced pancreatitis was taken as subjects after taking written informed consent obtaining approval from Ethics Committee.

Study Design: Observational study.

Sample Size: 52 patients were included in this study.

Selection of Subjects

Inclusion Criteria

1. Adult patients with Gallstone induced pancreatitis.

Exclusion Criteria

1. Patients with associated medical cause of jaundice (hepatitis, alcoholic liver disease etc).
2. Pancreatitis with mixed etiology is present.

Study Tools

1. Serial liver function test (LFT) to assess the presence and resolution of jaundice in all patients.
2. Serum amylase and serum lipase to establish the diagnosis of pancreatitis.
3. USG Whole Abdomen (all patients). Most of the USG was done in our institute with USG machine, brand Philips, EPIQ 7G, specificity and sensitivity is objective variable of radiologist.
 - To help with diagnosis of pancreatitis
 - To establish presence of gall bladder stone
 - To evaluate common bile duct (CBD) status in patient with jaundice
4. MRI (Siemens, 1.5T) and CT abdomen in selected patients especially in those presented with persistent jaundice.
5. Case recording Proforma.
6. Microsoft excel program for data entry.

Study Protocol: Among patients admitted with diagnosis of pancreatitis, those with the gallstone pancreatitis were the subject for the study. The presence of jaundice in such patient was noted and course of jaundice was documented by serial LFT. The proportion of patients that have spontaneous resolution of jaundice was noted along with the time of resolution. If there is persistent jaundice any additional imaging done was recorded. The finding of subsequent treatment of GSIP (viz. cholecystectomy) was also be noted. The follow up period was upto 6 weeks.

The data was collected and entered in MS excel 2010. Different statistical analysis was performed using SPSS software version 22.

RESULTS

An observational study involving 52 cases of gallstones induced pancreatitis was conducted to determine the prevalence of jaundice, time to resolution of jaundice and proportion of cases in which jaundice resolves spontaneously. The results were analyzed, represented graphically, and a conclusion was drawn from them.

Out of 52 study subjects, there were 24 males and 28 females in this study. The majority of study subjects were in the age group of 26–50 years, accounting for 44.2%, followed by the age group 51–75 years with 40.4%, 76–100 years of age 9.6% and 5.8% by 25 years.

Out of total study subjects, all 28 (53.8%) females were housewives. Whereas among 24 males 6 were shopkeepers, 5 were farmers and service persons, 3 were students, 2 were ex-service persons and salesman and only 1 was laborer. Majority 61.5% (32) cases of gallstone-induced pancreatitis had jaundice while rest 38.5% (20) of the cases was free from jaundice. [Table 1 & Figure 1]

Mean time of resolution was 4.25 ± 1.16 days in patients of clinical jaundice. [Table 2]

In this study more than 50% of the cases of gallstone-induced pancreatitis with jaundice were 19 women and 13 men. Whereas in the rest of the cases that were free of jaundice, 11 were men and only 9 were women. However, it shows an insignificant association ($p > 0.05$). Majority 15(46.87%) patients of gallstone-induced pancreatitis who had jaundice were from the age-group 26-50 followed by 12 (37.5%) patients from the age-group 51-75 years, 4(12.5%) patients from the age-group 76-100 years and only 1(3.12%) patient was from the age-group ≤ 25 years. However, it shows an insignificant difference ($p > 0.05$).

In this study an insignificant association was seen between USG findings (gall bladder size, number of stone, CBD size and intrahepatic-biliary radicals) and jaundice. Maximum number of patients were observed with distended gall bladder consisting of 28(68.29%) patients with jaundice followed by 4 (36.36%) patients with normal gall bladder size whereas, 13 and 7 patients who were not suffering from jaundice observed with distended and normal gall bladder size respectively. Maximum 23(60.53%) patients who had jaundice were observed with multiple stones while 2(40%) did not have a single stone, while in patients free from jaundice 15(75%) had multiple stone and 3 (60%) did not have any stone. CBD size was normal in majority of patients irrespective of either they had jaundice or not. In all 32 had normal CBD size followed by 17 dilated and 3 obscured. Intrahepatic biliary radicals was normal in all cases which were free from jaundice while

dilated intrahepatic biliary radicals found in 1 case who had jaundice. [Table 3]

In this study Serum amylase and lipase were insignificantly associated with obstructive jaundice ($p>0.05$) whereas bilirubin shows a significant difference ($p<0.05$).

Both parameters serum ALT (Alanine transaminase) and serum ALP (Alkaline phosphatase) show insignificant differences ($p>0.05$). Mean serum ALP was higher (119.90 ± 94.178) in patients who were free from jaundice while mean serum ALT was more (212.09 ± 138.620) in patients who had jaundice. [Table 4]

Gender was found to be insignificantly associated with time of cholecystectomy. Age group of patients was insignificant associated with time of cholecystectomy. As shown in table 14, an insignificant association was observed between jaundice and time of cholecystectomy. 29(64.4%) patients of jaundice were treated with delayed cholecystectomy while only 2(40%) patients were treated with index cholecystectomy.

Delayed or indexed cholecystectomy was insignificantly associated with time of resolution. Mean time of resolution was more, (4.04 ± 1.26) days, by delayed cholecystectomy as compared with index cholecystectomy.

Table 1: Prevalence of Jaundice in patients with gallstone-induced Pancreatitis

Jaundice	Frequency	Percent
Absent	20	38.5
Present	32	61.5
Total	52	100.0

Table 2: Duration for resolution in patients presented with chief complaint of clinical jaundice

Jaundice	Time of Resolution
Present	4.25 ± 1.164

Table 3: Distribution of USG findings as per chief complain jaundice

USG findings		Jaundice		Total	p-value*
		Absent	Present		
Gall bladder size	Normal	7 (63.64%)	4 (36.36%)	11 (21.52%)	0.081
	distended	13 (31.71%)	28 (68.29%)	41 (78.85%)	
Number of stones	Sludge	1 (25%)	3 (75%)	4 (7.69%)	0.208
	Single	1 (20%)	4 (80%)	5 (9.61%)	
	Multiple	15 (39.47%)	23 (60.53%)	38 (73.08%)	
	Nil	3 (60%)	2 (40%)	5 (9.61%)	
CBD size	Normal	12 (37.5%)	20 (62.5%)	32 (61.54%)	0.942
	dilated	7 (41.18%)	10 (58.82%)	17 (32.69%)	
	obscure	1 (33.33%)	2 (66.67%)	3 (5.77%)	
Intrahepatic biliary radicals	Normal	20 (39.21%)	31 (60.78%)	51 (98.08%)	1
	dilated	0 (0%)	1 (100%)	1 (1.92%)	

Table 4: Laboratory outcomes of patients with gallstone-induced pancreatitis presenting jaundice as chief complaint

Investigation	Jaundice						p-value*
	Absent			Present			
	min	max	Mean \pm SD	min	max	Mean \pm SD	
Serum amylase	712	4572	1890.45 \pm 911.61	158	5237	1890.75 \pm 1144.51	0.997
Lipase	951	4942	2649.65 \pm 935.86	132	7108	2656.03 \pm 1734.87	0.986
Bilirubin	0.38	1.48	1.0575 \pm 0.32	1.67	9.28	3.666 \pm 1.94	0.0001

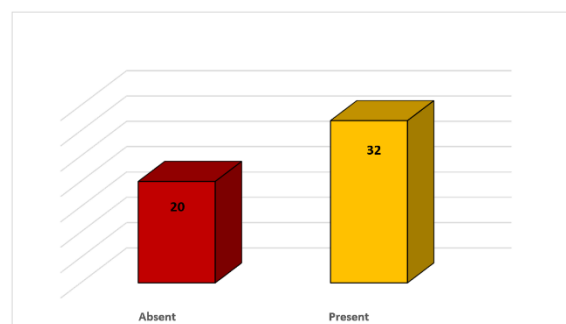


Figure 1: Prevalence of Jaundice in patients with gallstone

DISCUSSION

The current observational study was carried out in the Department of Surgery, over a period of 12 months. Total of 52 Patients diagnosed with Gallstone induced pancreatitis were recruited after taking written informed consent and obtaining approval from Ethics Committee.

The primary objective of our study was to assess the proportion of patient with jaundice in gallstone induced pancreatitis at the time of presentation. Secondary objective of our study was to assess proportion of cases in which jaundice resolves spontaneously and time of resolution to jaundice. Patients with associated medical cause of jaundice (hepatitis, alcoholic liver disease etc) were excluded from the study.

The study consist of 24 males and 28 females patients. There was female preponderance and all were housewives. Out of 28 females and 24 males, 19 females and 13 males had jaundice. Maximum numbers of patients were in the age group 26-50 years, accounting for 44.2% of total study subjects. Investigations were carried out and different types of operative procedures were conducted. In this study, more than 60% cases of gallstone-induced pancreatitis had jaundice while 38.5% of the cases were free from jaundice. In a study conducted by Shirahatti et al. they analyzed 50 patients and found that Serum values of alkaline phosphates and serum bilirubin was found to be on the higher side.^[7] Similar, findings were observed in a study conducted by Cheema et al.^[8] In this study, serum amylase, lipase and bilirubin was higher in jaundiced patients. Evaluation of jaundice with gallstone-induced pancreatitis is common but challenging radiological problem. The aim of the imaging is to assess the proportion of patient with jaundice in gallstone induced pancreatitis at the time of presentation. 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 the cheapest non-invasive tool to assess the cause and level of obstruction in the patients. The limitation of this diagnostic test was its high operator dependence. Ultrasound was performed in all our patients. It showed normal intrahepatic biliary radicles in 98.08% of patients. CBD size was dilated in 32.69% and obscure in 5.77% of patients. Majority of 38 (73.08%) patients with multiple stone, 23 had jaundice. Hurvitz et al,^[9] found calculi in 23 or 49% of 47 choledochal explorations performed in patients with acute and chronic pancreatitis.

A diagnosis of gallstone-induced acute pancreatitis is made when jaundice and elevated levels of serum ALP, serum GGT and serum trans amylase are detected by blood tests and common bile duct stones are visualized by ultrasonography in patients of acute pancreatitis. In this study mean serum ALP and serum ALT were found higher in patients with jaundice and differ insignificantly.

In our study, age groups of patients were insignificantly associated with time of cholecystectomy. Out of 45 patients of delayed cholecystectomy 20 (44.4%) belong to the age group 26-50 years followed by 18 (40%) from the age group 51-75 years 5(11.1%) from the age group of 76-100 years and 2(4.4%) from age group of ≤ 25 years. Whereas out of 5 patients of index cholecystectomy 2 were from the age group 26-50, 2 from the age group 51-75 and 1 from the age group ≤ 25 years. A recent study by Muangkaew et al,^[10] as well as the Tokyo guidelines have noted that in cases of biliary pancreatitis with mild cholangitis, conservative medical management and delaying ERCP may not impact morbidity or mortality.^[11] Nebiker et al. in their study revealed 13 out of 99 patients with gallstone pancreatitis had CBD stone, 2 in index cholecystectomy and 11 in delayed surgery group

which was statistically insignificant. They also reported need for MRCP in 31% and 54% of the cases in group 1 and group 2 respectively. Out of which 16% and 36% warranted need for ERCP in each group. In contrast, in this study MRCP was done in 45.65% patients of index surgery while 13.04% patients in delayed surgery group. In our study, mainly all variables like Serum amylase, serum lipase, serum bilirubin, gallbladder size, number of stones, CBD size, intrahepatic biliary radicals dilatation and jaundice were found insignificant with time of resolution of jaundice.

When jaundice and hepatic disorders are observed and the presence of common bile duct stones is strongly suspected, ERCP/ES should be performed on the assumption that endoscopic treatment of gallstone- induced pancreatitis is to be conducted. There are cases in which ERCP is conducted on the assumption that endoscopic papillary treatment is to be provided. According to a recent national survey (Level 4),^[12] investigating incidental diseases related to gastrointestinal endoscopy in Japan, the incidence of incidental diseases detected by diagnostic ERCP and therapeutic ERCP was 0.202 and 0.717%, respectively, and the mortality rate was 0.0065 and 0.052% of the overall death rate. In our study ERCP was performed in any case. The use of ERCP in patients with gallstone pancreatitis with jaundice has been reported to be of 29% by John stone et al and 17% by Falor et al,^[13] According to the previous study, jaundice at the time of presentation was noticed in 56.5% of patients, 23.9% of patients had a serum bilirubin of more than 3 mg/dL.

In this study, Out of 52 cases, 45 were performed with delayed cholecystectomy and 5 were with index cholecystectomy whereas 2 patients died. Sanchez-Ubeda et al,^[14] in their study of 29 cases of acute cholecystitis with acute pancreatitis performed cholecystectomy in all and explored the common bile duct in 20. Six of these cases were visibly icteric. In three, calculi were found in the common bile duct.

An insignificant association was observed between jaundice and time of cholecystectomy. 29(64.4%) patients of jaundice were treated by delayed cholecystectomy while only 2(40%) patients were treated by index cholecystectomy. We had 2 deaths in the follow up and those under evaluation due to unrelated causes (COVID-19).

CONCLUSION

The findings of the study are as follows:

In this study Female predominance was high with a male-female ratio of 6:7. Prevalence of jaundice was more in females as compared with males. Majority of the patients belong to age-group 26-50. Majority had distended gall bladder size and multiple stone. More than 50% of jaundiced patients had dilated CBD size and normal intrahepatic biliary radicals. High level of serum amylase, serum lipase, serum bilirubin, Serum ALT and Serum ALP were noted in

jaundiced patients. The treatment for bile duct stones with the use of ERCP/ES was not performed in cases of gallstone-induced pancreatitis with jaundice. Delayed cholecystectomy for gallstone-induced acute pancreatitis was performed in majority of subjects.

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