

## CLINICO-EPIDEMIOLOGICAL FEATURES OF PATIENTS OF ACUTE PANCREATITIS WITH AND WITHOUT BILIARY ASCARIASIS

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### Abstract

**Background:** Ascariasis invasion of the biliary tree is a well known entity and Pancreatitis is a complication of it. Many recent reports suggest ascariasis induced Acute Pancreatitis (AP) in the tropics, especially in several parts of Indian subcontinent including Bangladesh. This issue has not been well studied in our setting. The aim of this study was to describe and compare the clinico-epidemiological features of patients of AP with and without Biliary Ascariasis (BA).

**Materials and methods:** This hospital based cross-sectional study was conducted at Chittagong Medical College Hospital (CMCH) from April 2017 to September 2017. Thirty five patients of AP with BA and 35 patients of AP without BA from inpatient Department of Medicine and Department of Surgery of CMCH were conveniently included enrolled in this study. The data included a detailed history, clinical examination and investigations with particular references to complete blood cell count, liver function test, serum amylase and ultrasound of the abdomen.

**Results:** Patients with BA were comparatively younger than patients without BA. Females are significantly more (73.4% versus 42.9%) and representation was more from rural area (71.4% versus 49.9%) in BA group than patients without BA. Interval from symptom onset to admission was significantly more in cases of patients without BA in comparison to patients with BA (5.17±1.15 days versus 2.6±1.14 days). Pain was mostly colicky in patients with BA in contrast to patients without BA where the nature of the pain was mostly dull aching in nature. Other features of pain like site, onset, radiation, severity of pain were similar in both groups. History of worm emesis was significantly higher and anorexia was significantly lower in BA

group than without BA group. Patients with BA were more anemic than patients without BA, epigastric tenderness was more common in patients without BA than with BA and right hypochondriac tenderness was more common in patients with BA. There was no significant difference in the distribution of the laboratory parameters between two groups.

**Conclusion:** Female patients from rural area with a history of worm emesis and anorexia presented with colicky pain were likely to be a case of AP due to BA.

**Key words :** *Ascaris lumbricoides*; Acute pancreatitis; With or without biliary ascariasis.

### Introduction

Acute Pancreatitis (AP) is the most common specific gastrointestinal diagnosis for hospitalization. Overall, AP is associated with a significant mortality rate of 1% to 5%.<sup>1</sup> There is a lack of population-based studies from the Bangladesh that have evaluated the role of different etiologies in determining the prevalence of AP-related hospital admissions.

The variation in the etiology of pancreatitis is quite marked from series to series and depends on the country of origin.<sup>2</sup> Worldwide, gallstones are the most common cause accounting for approximately 45% of cases, alcohol being the second most common, accounting for 35% of cases.<sup>3</sup> *Ascaris*-induced pancreatitis is the most common form of parasite-induced pancreatitis observed in tropical and subtropical endemic areas. It is a type of Hepatobiliary and Pancreatic Ascariasis (HPA) where pancreatitis may be obstructive in nature by ascarides in the ampullary orifice or may be severe necrotizing type due worms entering the pancreatic duct. Immediate endoscopic treatment results in rapid resolution of the problem.<sup>4</sup>

Studies describing the difference in clinic-epidemiological features of AP patients with and without Biliary Ascariasis (BA) are in short supply, especially from Bangladesh. For early diagnosis this information is imperative to the clinicians. Chittagong Medical College Hospital (CMCH) is 1313 bedded tertiary hospital of Bangladesh with catchments

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*Submitted on : 20.10.2020*

*Accepted on : 08.12.2020*

area of population 3.5 million. A large number of patients with AP from the south-east part of Bangladesh are regularly receiving indoor service from this hospital. As there was scope this study was therefore carried out with the objective of assessing the clinico-epidemiological features among the patients of AP with and without BA.

### Materials and methods

This cross sectional study was conducted in CMCH between April 2017 and September 2017. Patients were conveniently selected from the Medicine and Surgery wards. Patients with history of chronic pancreatitis were excluded. Diagnosis of AP was established by two of the following three criteria- typical abdominal pain in the epigastrium that may radiate to the back, three fold or greater elevation in serum lipase and/or amylase and confirmatory findings of AP on abdominal imaging (Such as ultrasonography and/computed tomography). The diagnosis of BA was done by abdominal USG. Ethical clearance from the Ethical Review Committee of Chittagong Medical College was obtained. Within the allocated time and resource it was possible to include 35 patients of AP with BA in the study and another 35 AP patients without BA were included as comparison group.

Socio-demographic data including age, sex, residence, monthly family income were noted for each patient in a case record form. Details clinical presentations were noted and complete blood cell count, liver function test, serum amylase, ultrasound of the abdomen were performed in all the patients at the time of admission.

The statistical analysis was carried out by using Statistical Package for Social Sciences (SPSS-23). Continuous variables were statistically described in terms of mean (Standard deviation) and compared between groups by Independent sample t-test. Qualitative or categorical variables were described as frequencies and proportions and compared with Chi-square test or Fisher's Exact test whichever was applicable. p value less than 0.05 was considered as statistically significant.

### Results

Mean age of the patients with or without BA was similar in the study. Regarding sex, females were significantly more in BA group than male. Patients

in the BA group were significantly more from the rural area than urban area. Monthly family income was significantly more among the patients without BA than their counterpart (Table I).

**Table I :** Socio-demographic characteristics of the AP patients with or without BA.

Variables		AP with BA (n=35)	AP without BA (n=35)	p value (n=35)
Age	Mean $\pm$ SD years	35.4 $\pm$ 16.6	36.9 $\pm$ 18.7	0.588
Sex	Male	9 (25.7%)	20 (57.1%)	0.008
	Female	26 (74.3%)	15 (42.9%)	
Residence	Rural	25 (71.4%)	14 (39.9%)	<0.001
	Urban	5 (14.3%)	21 (60.1%)	
	Slum	5 (14.3%)	0 (0%)	
Monthly family income	<10,000 BDT	9 (25.71%)	05 (14.28%)	0.043
	10,000-20000 BDT	16 (45.71%)	10 (28.57%)	
	>20,000 BDT	10 (28.57%)	20 (57.14%)	

Data were expressed as frequency (Percentage) if not otherwise specified, AP: Acute Pancreatitis, BA: Biliary Ascariasis, BDT: Bangladeshi Taka.

Interval in days from symptom onset to admission was significantly more in cases of patients without BA in comparison to patients with BA. However, except nature of the pain other features like site, onset, radiation, severity of pain were similar in both groups. In patients with BA the nature of pain was mostly colicky in contrast to patients without BA where the nature of the pain was mostly dull aching in nature (Table II).

**Table II :** Pain characteristics of the AP patients with or without BA.

Variables		AP with BA (n=35)	AP without BA (n=35)	p value
Duration <sup>a</sup>	Mean $\pm$ SD (Days)	2.6 $\pm$ 1.14	5.17 $\pm$ 1.15	<0.001
Site	Epigastric	20 (57.14%)	12 (34.29%)	0.165
	Hypochondriac	2 (5.71%)	7 (20%)	
	Both	5 (14.29%)	6 (17.14%)	
	Diffuse	8 (22.86%)	10 (28.57%)	
Onset	Sudden	15 (42.86%)	10 (28.57%)	0.212
	Gradual	20 (57.14%)	25 (71.43%)	
Radiation	Back	25(71.43%)	30 (85.71%)	0.063
	Scapula	5(14.29%)	0 (%)	
	Right shoulder	04(11.43%)	0 (%)	
	Entire abdomen	1(2.86%)	5(14.29%)	
Nature	Colicky	31(88.57%)	5 (14.29%)	<0.001
	Dull aching	4 (11.43%)	30(85.71%)	
Severity	Severe	33(94.29%)	34 (97.14%)	0.555
	Moderate	2(5.71%)	1(2.86%)	

Data were expressed as frequency (Percentage) if not otherwise specified, AP: Acute Pancreatitis, BA: Biliary Ascariasis, <sup>a</sup>Symptoms onset to admission.

Significantly higher proportion of patients with BA reported worm emesis than AP patients without BA ( $p < 0.001$ ). Anorexia was significantly higher in patients with BA than without BA. Other associated symptoms are similar in two groups (Table III). Regarding physical examination findings patients with BA were more anemic than patients without BA. Other findings were similar between two groups. In local abdominal examination findings epigastric tenderness was more common in patients without BA than with BA and right hypochondriac tenderness was more common in patients with BA (Table III).

**Table III:** Pain characteristics of the AP patients with or without BA.

Variables	AP with BA (n=35)	AP without BA (n=35)	p value
Anorexia	25(71.43%)	15(42.86%)	0.016
Nausea/	30(85.71%)	25(71.43%)	0.145
Vomiting	20(57.14%)	15(42.86%)	0.231
H/O worm emesis	12(34.29%)	0 (0%)	<0.001
Jaundice	4(11.43%)	2(5.71%)	0.393
Itching	4(11.43%)	1(2.86%)	0.164
Fever	4(11.43%)	2(5.71%)	0.393
Abdominal distension	1(2.86%)	2(5.71%)	0.551
Constipation	1(2.86%)	2(5.71%)	0.551
Anaemia	15(42.86%)	2 (5.71%)	<0.001
Jaundice	04(11.43%)	2(5.71%)	0.393
Dehydration	20(57.14%)	15(42.86%)	0.232
Tachecardia	20(57.14%)	15(42.86%)	0.232
Increased temperature	31(88.57%)	33(94.29%)	0.393
Epigastric tenderness	12(34.29%)	20(57.14%)	0.009
RHC tenderness	7(20%)	2(5.71%)	0.052
Diffuse tenderness	10(28.57%)	8(22.86%)	0.584
Guarding	5(14.29%)	10(28.57%)	0.145
Shifting dullness	1(2.86%)	2(5.71%)	0.551
Distension	1(2.86%)	2(5.71%)	0.551

Data were expressed as frequency (Percentage), AP: Acute pancreatitis, BA: Biliary Ascariasis.

Complete blood count, liver function test, pancreatic enzymes and CRP were done in all patients. Table IV depicts that, though there were some differences in the laboratory parameters between patients with or without BA only differences in hemoglobin reached the statistical significance. Hemoglobin concentration was significantly lower in

patients with BA compared to patients without BA. Out of 70 patients 6 patients presented with cholangitis (4 in AP with BA and 2 in AP without BA) (Not shown in the Table).

**Table IV :** Comparison of laboratory parameters between two groups.

Laboratory parameters	AP with BA (n=35)	AP without BA (n=35)	p value
Hb, gm/dl	10.01±4.46	12.3±3.23	0.041
ESR mm in 1 <sup>st</sup> hour	120±60.31	110±20.12	0.294
WBC /cmm	10931±4501	11000±2314	0.341
Platelet /cmm	30000±28932	30000±25000	0.415
Neutrophil (%)	70±15	75±12	0.325
Lymphocyte, (%)	13±6	18±5	0.123
Monocyte (%)	3±1	3±1	0.989
Eosinophil (%)	7±1	3±1	0.065
Basophil, (%)	3±1	2±1	0.898
Serum bilirubin mg/dl	1.1±0.5	1±0.2	0.998
SGPT, U/L	32±6	30±3	0.784
SGOT, U/L	120±36	90±23	0.565
Serum amylase, U/L	2200±654	2000±365	0.564
Serum lipase, U/L	5000±1632	4000±1400	0.245
CRP	30±16	24±12	0.289

Data were expressed as mean ±SD, AP: Acute pancreatitis, BA: Biliary Ascariasis.

## Discussion

This hospital based cross-sectional study was done to identify differences if any in clinic-epidemiological features between patients of AP with or without BA. Thirty five patients of acute pancreatitis in each group were included and compared.

Regarding age there was no significant difference between two groups. The mean age of the patients with BA and female predominance was in agreement with other study that included patients with BA.<sup>5</sup> HPA affects women more than men with a ratio of 3:1. Adults are more commonly involved than children with a mean age of 35–42 years, a fact that may reflect the inability of the worms to invade the small-caliber childhood ducts. Pregnancy and fasting have also been implicated as risk factors for HPA in endemic areas.<sup>6,7</sup>

Larger proportion of patients with BA in the current study was from rural area which was in agreement with other studies conducted on BPA.<sup>5,8-10</sup> Monthly family income was significantly less among the patients without BA than

their counterpart. Poverty and over crowding, unhygienic living conditions and poor sanitation contribute to the spread of infection from person to person.<sup>11</sup> Most of the cases were from the south eastern part of Bangladesh. The soil of these parts of the country is more humid than other parts of the country which are excellent conditions for the development of the larval stage of the organism.<sup>7</sup>

Interval in days from symptom onset to admission was significantly more in cases of patients without BA in comparison to patients with BA. It was probably attributed to the fact that, pain developed gradually in pancreatitis without BA and it was dull aching in nature. But, the colicky pain of BA usually not resolved with analgesic and brings the patients urgently in the hospital. Patient with HBP may present with sudden episodes of pancreatitis, for which the etiology was initially unknown.<sup>12</sup> Sandouk et al reported that USG, together with clinical findings, are the mainstay of diagnosing pancreatic ascariasis.<sup>4</sup> In this study the presenting features of pancreatitis patients were pain, nausea, vomiting, fever, abdominal distension, constipation and jaundice. History of worm emesis was significantly more in patients with BA. Similar results have been reported in another study.<sup>4</sup>

The current study showed that, except nature of the pain, other features like site, onset, radiation, severity of pain were similar in both groups. Ascariasis related clinical disease is not just restricted to patients with a heavy worm load but may be seen with a single worm lodged in the biliary tract and negative parasitic tests in the stools. Pain is sudden in onset but may be gradual, the epigastrium being the commonest location. Other accompanying symptoms are vomiting, nausea and anorexia, jaundice with fever being a sign of associated biliary tract involvement.<sup>13</sup> In a retrospective study on 50 cases of AP in another tertiary care hospital of Bangladesh revealed similar clinical presentations.<sup>14</sup>

A study from India reported that, a considerable portion (23%) of AP is caused by BA and majority (78%) was mild pancreatitis. However, in 13.6% cases it was also accompanied with pyogenic cholangitis.<sup>15</sup> In the present study only 6 patients presented with cholangitis and most of the patients have mild pancreatitis as evident by clinical features.

### Limitations

Small sample size, non-probability sampling technique and sampling from a single tertiary care government run hospital might limit the generalizability of the study findings.

### Conclusions

Our study identified some socio-demographic factors (Like female sex, rural residence low income) and clinical features (Short interval from symptom onset to admission, colicky nature of the pain, history of worm emesis, presence of anemia, absence of epigastric tenderness) which might help to differentiate AP patients with BA than AP patients without BA.

### Recommendations

Large scale multicenter study is needed to get the national scenario. Clinician should be aware about BA as a cause of AP in our setting. Nationwide deworming program should be strengthened for all age group

### Acknowledgments

It was a self funded study. The authors would like to thank all survey participants for their involvement, as well as the Physicians of the respective ward of CMCH for their collaboration and cooperation.

### Contribution of authors

SD-Conception, design, data collection, drafting & final approval.

RM-Interpretation of data, critical revision & final approval.

MSW-Conception, drafting & final approval.

BRC-Data analysis, drafting & final approval.

FUA-Data analysis, drafting, interpretation of data & final approval.

FHC-Data analysis, critical revision & final approval.

### Disclosure

All authors declared no competing interest.

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