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## Challenges of Management of Acute Pancreatitis in a Tertiary Medical Center of Bangladesh

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### Abstract

**Background:** Acute pancreatitis is the most common and dangerous medical emergency in the practice of gastroenterology. Severity of presentation and uncertain prognosis make it as a threatening disease. There is limited information on how well physicians comply with standard guidelines, but compliance is suboptimal in developing countries, according to several studies

**Objective:** This study was intended to determine the clinico-pathological profile, severity assessment, etiology and challenges of management of acute pancreatitis in tertiary care hospital of Bangladesh.

**Materials and Methods:** In this cross sectional study, We included 384 patients of acute pancreatitis who were admitted at department of gastroenterology in Rangpur medical college hospital. We have collected data from both hospital records and patients regarding study variables.

**Result:** In this study our main concern was to identify the challenges of management in acute pancreatitis. The most common challenges we faced was delayed admission (59.11%). Others were delayed hospital diagnosis by physicians (42.97%) non-adherence of patient party regarding (29.95%), lack of investigations facility at hospital (53.13%) and only 8.07% faced no challenges during management. Only 13% patients got current guideline-based treatment of acute pancreatitis.

**Conclusion:** In our study, we have explored some unknown and new challenges regarding management of acute pancreatitis. Addressing these challenges, we should be careful while managing patients of acute pancreatitis to reduce morbidity and mortality.

**Keywords:** Acute pancreatitis, Challenges of management, Guideline-based treatment.

### Introduction

Acute pancreatitis is an acute inflammatory process of the pancreas with variable involvement of other regional tissues or remote organ systems. Most attacks have a benign course but severe attacks may lead to shock, renal failure, respiratory failure and death. Acute pancreatitis is the most common and dangerous medical emergency in the practice of gastroenterology. Severity of presentation and uncertain prognosis make it as a threatening disease.<sup>1</sup> Acute pancreatitis is defined clinically by any 2 of the

following 3 criteria: abdominal pain consistent with pancreatitis, serum amylase or lipase level greater than 3 times the laboratory's upper limit of normal and radiologic imaging evidence of pancreatitis, usually by CT or MRI.<sup>2</sup> It is important to recognize severe acute pancreatitis early because the patient needs to be transferred to a step-down unit or intensive care unit to receive optimal fluid resuscitation and supportive care for organ dysfunction. After 48 to 72 hours, a prediction of severe acute pancreatitis should also prompt the physician to order CT to detect pancreatic necrosis, and also to initiate nutritional support.<sup>3,4</sup>

Several clinical scoring systems have been studied for assessing severity. The Ranson score is based on 11 clinical factors, 5 checked at admission and 6 checked at 48 hours. Patients are at higher risk of death or "serious illness" (needing 7 or more days of

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intensive care) if they have 3 or more of these factors.<sup>1,3</sup> The APACHE II (Acute Physiology and Chronic Health Evaluation II) score is more versatile. It is based on multiple clinical and laboratory values, and it correlates very well with the risk of death in acute pancreatitis. Death rates are less than 4% when the APACHE II score is less than 8, and 11% to 18% when it is 8 or higher.<sup>6</sup> BISAP, a new five-point scoring system, was recently prospectively validated.<sup>9</sup>

- B-Blood urea nitrogen level > 25 mg/dL
- I- Impaired mental status
- S- SIRS
- A-Age > 60 years
- P-Pleural effusion.

The presence of three or more of these factors correlates with higher risk of death, organ failure, and pancreatic necrosis.<sup>9</sup> Compared with APACHE II, BISAP has similar accuracy and is easier to calculate. The ACG advises calculating the APACHE II score within 3 days of admission and measuring the hematocrit at admission, at 12 hours, and at 24 hours. Most cases of acute pancreatitis are mild, with rapid recovery and excellent prognosis. However, 15% to 20% are severe and may result in a prolonged hospitalization, systemic inflammatory response syndrome (SIRS), multiorgan system failure, and death.<sup>10,11</sup>

Indicators of severity on CT are not usually evident until 2 to 3 days after admission.<sup>12</sup> CT at the time of admission may be warranted to rule out other life-threatening causes of abdominal pain and hyperamylasemia (e.g., bowel obstruction, viscus perforation). CT may also be useful in the late phase of acute pancreatitis (weeks after admission) to diagnose or monitor complications (e.g., pseudocysts, abscesses, splenic vein thrombosis, splenic artery pseudoaneurysms). Magnetic resonance imaging with gadolinium contrast is a reasonable alternative to CT for detecting pancreatic necrosis and other local complications. The Balthazar-Ranson CT severity index has total 10 points which includes the degree of pancreatic enlargement and inflammation, presence and number of fluid collections, and degree of necrosis.

The American College of Gastroenterology (ACG) guidelines state that daily monitoring of amylase and lipase has limited value in managing acute pancreatitis. But in most cases of acute pancreatitis, daily serum enzyme measurements add cost but little benefit.

Experts have suggested initially infusing 500 to 1,000 mL of fluid per hour in those who are volume depleted, initially infusing 250 to 350 mL per hour in those who are not volume depleted, and adjusting the fluid rate every 1 to 4 hours on the basis of clinical variables.<sup>17</sup> The sufficiency of fluid replacement should be carefully monitored by vital signs, urine output, and serum hematocrit. On the other hand, overly aggressive fluid resuscitation can be detrimental in patients at risk of volume overload or pulmonary edema.

Early nutritional support has been shown to improve outcomes in severe acute pancreatitis.<sup>18</sup> Enteral nutrition is preferred to parenteral nutrition in pancreatitis: it is less expensive and does not pose a risk of catheter-related infection or thrombosis or hepatic complications. Also, there is experimental evidence that enteral nutrition may preserve the gut barrier, decreasing mucosal permeability and bacterial translocation.<sup>19</sup>

Antibiotics are not indicated in mild acute pancreatitis. A limited course of antibiotics is typically indicated in severe cases with suspected or proven infected necrosis (in conjunction with surgical necrosectomy). However, the use of antibiotics in sterile necrosis has been very controversial. The AGA guidelines recommend against routinely giving antibiotics in mild acute pancreatitis and do not provide strict recommendations for prophylactic antibiotic use in necrotizing acute pancreatitis. ERCP has a limited role in patients with biliary pancreatitis, being used to clear retained bile duct stones or to relieve ongoing biliary obstruction.

Various studies have been undertaken in our country and abroad related to acute pancreatitis, its presentation and role of various laboratory and imaging techniques for diagnosis and prognostication.

Management of acute pancreatitis needs multidisciplinary approach with support start from emergency to ICU. So, there is a chance of mismanagement in every step facing the physicians in a challenge in management especially in low resource settings. Other factors are patient's financial condition, education, social belief, transport facility, referral system from periphery. All these factors may challenge the management as well as prognosis of patient.<sup>10-12</sup> Moreover, early assessment is not possible in all patients especially in delayed admission by current scoring systems. That's why the present study was intended to determine the clinico-

pathological profile, severity assessment, etiology and challenges of management of acute pancreatitis in a government laid tertiary care hospital to image the real scenario of management in a limited resource place.

### Methodology

This descriptive type of Cross-sectional study was conducted in the Department of Gastroenterology, Rangpur medical college hospital from October 2022 to April 2023 over a period of six (06) months. Total 384 admitted patients fulfilling American College of Gastroenterology (ACG) criteria for diagnosis of acute pancreatitis were included for the study. Patients with chronic pancreatitis, pancreatic tumors, past history of pancreatic were excluded from the study.

A self-structured data sheet was prepared for data collection. Data were collected from both admission file records and patients by direct interview. The datasheet contains 03 parts.

- First part covers sociodemographic characteristics of patients of acute pancreatitis.
- Second part contains questions regarding clinical features of acute pancreatitis.
- Third part covers questions regarding investigation and management of acute pancreatitis.

All collected data were checked very carefully to identify any error in data collection. Data processing work were consisting of registration of schedules, editing, coding-decoding and computerization, preparation of dummy tables, analysis and matching of data. The technical matter of editing, encoding and computerization were followed up by investigator. Informed written consent were taken from all the study subjects. After admission FBC, CRP, Liver function test, Blood urea and creatinine, Blood glucose, lipid profile, plain X-Ray abdomen, Chest X-Ray were performed to all patients. All cases were divided into mild, moderately severe and severe acute pancreatitis by Revised Atlanta criteria 2012.<sup>3</sup> CT scan of pancreas were done when indicated; usually after 72 hours. Ultrasonogram were repeated when symptoms persist or suspicion of local complications arises during admission period. An informed consent was sought from the patient to take part in this study.

Statistical analyses were carried out by using the Statistical Package for Social Sciences (SPSS) version 25.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables expressed as mean & standard deviation and categorical variables as frequencies and percentages. The difference between groups was analyzed by Chi square test and t test shown with cross tabulation. *p*- value <0.05 was considered as significant.

Ethical permission was taken from National Research Ethics Committee (NREC) after getting grant permission from BMRC. After conclusive recruitment of the subjects, the objective, nature, purpose, potential risks and benefits of all the procedures of the study were explained in detail to the patients and informed written consent was taken from them.

### Results:

In this study among 384 cases, 280 were male and 104 were female participants. Most of the patients were between 31-50 years of age. Regarding severity, 85 % of the patients admitted with mild acute pancreatitis whereas 13% were moderately severe and remaining 2% had severe acute pancreatitis according to the revised Atlanta criteria. The most common aetiology of acute pancreatitis in our study were gall stone (15.10%) and biliary sludge (15.10%), whereas in 54% cases no identifiable cause was found, hence labeled as idiopathic.

Plain Abdominal X-ray showed related findings such as colon cut off sign, sentinel loops or paralytic ileus were found in 77% patients and unrelated finding in remaining patients. Ultra sonogram of abdomen showed abnormality in either pancreas or surrounding area in 80% patients. Chest X-ray finding was normal in 76% patients and unilateral or bilateral effusion were found in 23% patients.

CT scan of Abdomen were performed in those patients whose symptoms was not resolved or suspicious of local complications. Most of the patients showed swollen pancreas (42.97%) and peripancreatic fat stranding (21.88%), while rest showed pseudocyst (7.03%), ascites (2.8%), pancreatic necrosis (1.04%).

Most of the patients were admitted between 3-5days (42.97%), only 15.10% patients were admitted within 24 hours and rest 17.97% admitted after 05 days of acute attack. Regarding hospitalization period, 69%

patients admitted for less than 07 days. Only 15.10% patients developed local complications and 8.07% patients suffered from different systemic complications. Majority of study subjects in our study (83.85%) improved with conservative treatment, only 31 patients needed ICU support.

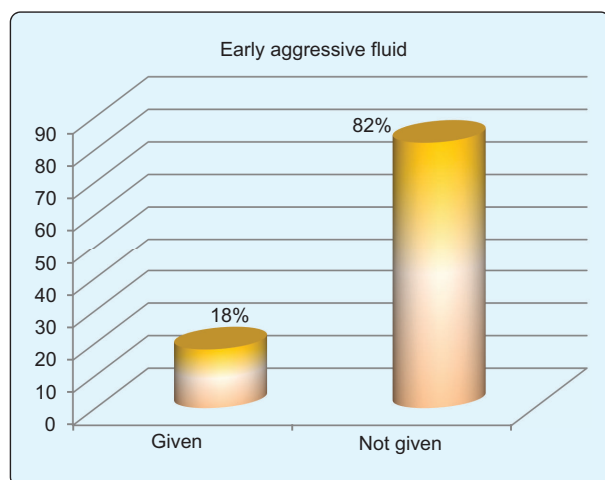
**Table I:** Challenges regarding Diagnosis of Acute Pancreatitis:

Challenges	Frequency (n)	Percentage
Inaccurate primary diagnosis	207	53.91
Lack of Investigation facility	123	32.03
Inappropriate radiological diagnosis	180	46.88
Financial problem	227	59.11

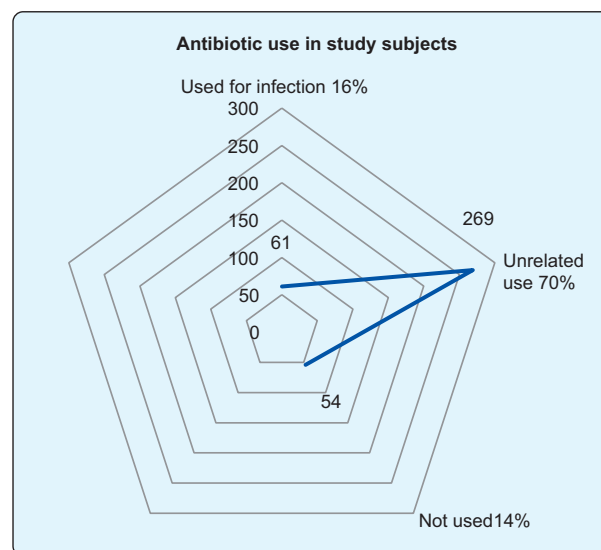
We faced a difficulty while diagnosing acute pancreatitis mostly due to primary inaccurate diagnosis (53.91%) and financial problem (59.11%). Whereas during assessment of severity, lack of Physicians knowledge (88.02%) and lack diagnostic tools (71.88%) were the most encountered challenges.

**Table II:** Challenges regarding severity assessment of Acute Pancreatitis (n=384)

Challenges	Frequency (n)	Percentage
Lack of Physicians knowledge regarding assessment criteria	338	88.02
Lack of Investigation tools	276	71.88
Inappropriate radiological diagnosis	180	46.88
Patient party non compliance	207	53.91



**Figure-1:** Challenges regarding early aggressive fluid administration (n=384)



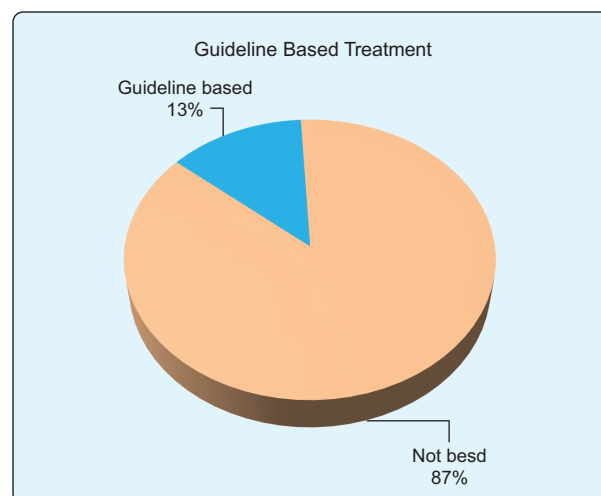
**Figure 2:** Challenges regarding use of antibiotic in acute pancreatitis (n=384)

Challenges regarding treatment of acute pancreatitis:

**Table III:** Challenges regarding interventional treatment of acute pancreatitis (n=134)

Challenges	Frequency (n)	Percentage
Lack of EUS	134	100.00
Lack of ERCP	54	40.29
Physicians lack of technical training	115	85.82
Lack of party compliance/ confidence	46	34.33

When patients of acute pancreatitis need any interventional support, we found that lack of EUS and ERCP machine as well as lack of physicians training renders the procedures.



**Figure 3:** Challenges regarding guideline-based treatment of acute pancreatitis (n=384)



**Table IV:** Challenges regarding overall management of acute pancreatitis (n=384)

Challenges of management	Frequency (n)	Percentage
Delay in admission (>48 hrs)	227	59.11
Non-adherence of patient/party	115	29.95
Lack of investigation facility	204	53.13
Delay in hospital diagnosis	165	42.97
Lack of HDU/ICU support	146	38.02
None	31	8.07

In this study our main concern was to identify the challenges of management in acute pancreatitis. The most common challenges we faced was delayed admission (59.11%). Others were delayed hospital diagnosis by physicians (42.97%), non-adherence of patient party regarding (29.95%), lack of investigations facility at hospital (53.13%) and only 8.07% faced no challenges during management. Only 13% patients got current guideline based treatment of acute pancreatitis.

### Discussion

Acute pancreatitis is a disease of modern civilization with wide clinical presentation and its incidence is increasing day by day. This study was aimed to identify the challenges at different stages of management of acute pancreatitis. In this study, 384 cases of acute pancreatitis were found during study period, most of them (50%) were between 31-50 years of age. A study done at India by Bhimwal RK et al. on 2017 found 32.5% patients were in the age group (30-39 years), followed by 25% in the (50-59) years age group which was close to our result.<sup>22</sup>

Regarding etiology of acute pancreatitis, biliary pancreatitis were the major identifiable cause (30%), whereas idiopathic accounts in 53.65% of cases and alcoholism comprised only 2.08% cases. In a study in BIRDEM, metabolic cause was found to be the most common cause of acute pancreatitis (37.5%), followed by gallstone disease. Among the severe acute pancreatitis cases, they found gallstone disease as the most common cause (42.8%). These finding is quite similar to present study.<sup>23</sup> A study by Blarney SL et al. have shown gall stone as major factor in 44% of cases, while alcohol accounted for 33% of cases and rest 24% being idiopathic.<sup>20</sup> Kandasami P and colleagues. reported that 78% of males the predominant etiology is alcoholism and 77% of females, the etiology for acute pancreatitis is biliary etiology.<sup>24</sup> In another study in India, diabetes mellitus

was most prevalent in the study population 62.5%.<sup>25</sup> This difference may be due to different cultural and socioeconomic group and less occurrence of gall stones in these areas. High rates of idiopathic cause may be due to some hidden causes, which cannot be explored in our hospital settings. In our hospital setting, if EUS and ERCP could be possible, many treatable causes would be identified. Studies prepared for comparison of numerous scores have found out that no single scoring system can correctly

predict the result however they were valuable in initial triaging of patients.<sup>26,27</sup> Our study highlights that Ranson's criteria might be still valuable in initial triage of patients and subsequent management. Other scoring frameworks could be utilized as triaging instruments for proper administration. In a German study, only 32% of gastroenterologists used the APACHE II score for assessing risk in acute pancreatitis, in spite of national guidelines emphasizing its importance.<sup>28</sup> We faced challenges at different levels of acute pancreatitis management. Challenges while diagnosing acute pancreatitis, the mostly faced problems are inaccurate physician diagnosis and financial problems. It is due to physician's workload and inappropriate distribution of training focused on common and trending diseases. Most of the patient were admitted in primary level government laid hospital, where diagnostic facility were limited. This may be a cause of delayed diagnosis. Few studies have been done to assess physicians' compliance with recommendations for aggressive volume replacement. In our study we found only 18% patients receive early aggressive fluid after their admission. In an Italian multicenter study, patients with mild or severe acute pancreatitis received an average of only 2.5 L of fluid per day (about 100 mL/hour).<sup>29</sup> Gardner et al. recently summarized the available evidence for fluid support in acute pancreatitis.<sup>30</sup>

In this study, we found injudicious use of antibiotic in 70 % of cases, which is very much dangerous for current situation of antibiotic resistance era. In a recent point prevalence survey (PPS) conducted, it was estimated that 85% of antibiotics use was inappropriate when compared to the local guidelines.<sup>31</sup> In an Indian study on antibiotic uses in acute pancreatitis showed 66.4% received prophylactic antibiotics, which is close to our findings.<sup>32</sup> In an Italian multicenter study, 9% of patients with mild acute

pancreatitis were treated with antibiotics.<sup>19</sup> Moreover, many patients with proven infected necrosis received antibiotics that do not penetrate the pancreatic tissue very well.<sup>33</sup>

Early enteral nutrition is beneficial to parenteral nutrition in pancreatitis. It is easily available, inexpensive and no risk of catheter-related infection, thrombosis or other complications. There is substantial evidence that enteral nutrition maintains gut integrity, decreasing mucosal permeability and bacterial infections. In our study, majority of the patient were given oral feeding after 03-05 days of their admission (76.04%). In a study of German gastroenterologists, only 73% favored enteral over parenteral feeding in acute pancreatitis.<sup>28</sup> Regarding interventional management of acute pancreatitis, we faced challenges due to lack of machines and physician's training in most of the cases. But we also faced lack of patient party compliance in 62.71 % case, which may be either due to financial problem or social stigmata. The ACG guidelines suggest urgent ERCP (preferably within 24 hours) for those with severe biliary pancreatitis complicated by organ failure or those with suspicion of cholangitis. Compliance rates with these guidelines are not adequate. In a study of adherence to the British Society of Gastroenterology guidelines, early ERCP was performed in only 25% of patients with severe biliary acute pancreatitis.<sup>34</sup>

Overall standard guideline-based treatment was given to only 13% of patients in our study. The main reasons are may be late admission, physician's lack of current knowledge and financial problem of the patient.

## Conclusion

More than a century after its comprehensive description, acute pancreatitis is still remaining a common disorder with devastating outcomes. The aim of this study was to create awareness about practicing deviations from current recommendations that may lead to adverse patient outcomes. Obviously, this study is a milestone as it is the first from Bangladesh that has evaluated the challenges of management of acute pancreatitis in average settings. More physicians training on current guidelines, standard referral system, judicious use of medications and multidisciplinary management can upgrade the current situation in management of acute pancreatitis. Thus, the most important objective in improving treatment results in acute pancreatitis is the use of standardized approaches to diagnostics and treatment of various

forms of the disease and its complications, taking into account the modern generally accepted international classification.

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*Conflict of interest: We have no conflict of interest.*

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