

## Original Research Article

# An observational descriptive study on the incidence, severity and outcome of different etiological varieties of acute pancreatitis in a rural based teaching hospital

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## ABSTRACT

**Background:** According to the 1992 Atlanta Symposium, acute pancreatitis (AP) is defined as an acute inflammatory process of the pancreas that may also involve peripancreatic tissues and remote organ systems.

**Methods:** It was an observational descriptive study. The study was from May 2012 to April 2013. The study was undertaken in the department of General Surgery of Burdwan Medical College and Hospital.

**Results:** In this study, we found that alcohol was the most common etiological factor present in 48.57% of patients, whereas gallstones come second being present in 31.42% cases. Among Indian studies, one found 60% cases being gallstone induced, while another found alcoholism as the most common cause. The study that found alcoholism as the most common cause of acute pancreatitis was also from Eastern India (West Bengal, to be precise). In our study, 17.14% cases of acute pancreatitis had to be classified as idiopathic pancreatitis, as no readily identifiable cause was found. In most series, 10-25% cases are found to be idiopathic. From results, it is seen that most cases of acute pancreatitis tend to occur in the age group 41-50 yrs (40%) followed by 31-40 yrs (34.28%).

**Conclusions:** This study was done to estimate the incidence of different etiological varieties of acute pancreatitis, to estimate the incidence of mild and severe acute pancreatitis and accordingly necessity for CT scan, to estimate the outcome in terms of cure, recurrence, morbidity and mortality. 35 patients of acute pancreatitis were enrolled for the study.

**Keywords:** Acute pancreatitis, Incidence, Severity

## INTRODUCTION

According to the 1992 Atlanta Symposium, acute pancreatitis (AP) is defined as an acute inflammatory process of the pancreas that may also involve peripancreatic tissues and remote organ systems.<sup>1</sup> Acute pancreatitis is the final result of abnormal pancreatic enzyme activation inside acinar cells. Immunolocalization studies have shown that after 15 minutes of pancreatic injury, both zymogen granules and

lysosomes colocalize inside the acinar cells. The fact that zymogen and lysosome colocalization occurs before amylase level elevation, pancreatic edema, and other markers of pancreatitis are evident suggests that colocalization is an early step in the pathophysiology and not a consequence of pancreatitis.<sup>2</sup>

Intra-acinar pancreatic enzyme activation induces autodigestion of normal pancreatic parenchyma. In response to this initial insult, acinar cells release

proinflammatory cytokines, such as tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), interleukins (IL)-1,-2, and -6, and anti-inflammatory mediators such as IL-10 and IL-1 receptor antagonist. These mediators do not initiate pancreatic injury but propagate the response locally and systemically. TNF- $\alpha$ , IL-1, and IL-7, neutrophils, and macrophages are recruited into the pancreatic parenchyma and cause the release of more TNF- $\alpha$ , IL-1, IL-6, reactive oxygen metabolites, prostaglandins, platelet-activating factor, and leukotrienes.<sup>3</sup>

Inflammatory cascade is self-limited in approximately 80% to 90% of patients, in the remaining patients, a vicious cycle of recurring pancreatic injury and local and systemic inflammatory reaction persists. In severe cases, the inflammatory response causes local hemorrhage and pancreatic necrosis. In one series from our country it was seen that 60% of cases with acute pancreatitis were gall stone induced.<sup>4</sup>

Whereas in another study alcohol was the commonest cause (35.5%) followed by gallstones (22%). The etiology of acute pancreatitis should be determined in at least 80% of cases and no more than 20% should be classified as idiopathic. Most cases respond well to conservative management but a small yet significant subgroup (10-20%) develops severe acute pancreatitis characterized by severe parenchymal necrosis of the gland and subsequent multi organ failure and contribute to the mortality (15-20%) of the disease. Acute renal failure is one such condition, risk of which increases in patients of severe acute pancreatitis and concomitant presence of these two diagnoses significantly increases the mortality.<sup>5</sup>

Predicting severity is an essential step while evaluating a patient with AP as it allows physicians to stratify disease severity and management strategies. Several prognostic scoring systems based of clinical, laboratorial and radiologic evaluations have been created or adapted to predict outcome, some based on local complications and other reflecting systemic manifestations of AP. Contrast-enhanced CT scan is the best imaging technique to exclude conditions that masquerade as acute pancreatitis, to diagnose the severity of acute pancreatitis, and to identify complications of pancreatitis.<sup>6</sup>

So our study was aimed to identify the scenario in a rural teaching hospital in terms of the relative incidence of gall stone induced, alcohol induced, traumatic and idiopathic acute pancreatitis, estimate the incidence of mild and severe acute pancreatitis and to estimate the outcome in terms of cure, recurrence, morbidity and mortality.

## METHODS

It was an observational descriptive study. The study was from May 2012- April 2013. The study was undertaken in the department of General Surgery of Burdwan Medical College and Hospital. All patients admitted with acute

pancreatitis to the Department of General Surgery and General Medicine, Burdwan Medical College during the study period (total=35) was included in the study. Exclusion criteria was patients having other co-morbid conditions viz diabetes, hypertension, patients aged <8 and >60 yrs, patients who do not give written consent for inclusion in this study and patients on some long term medication for any other medical condition.

No sampling was done and no control was required. The entire patient underwent same blood investigation and CT scan (if needed). Patients were reviewed at admission by history, clinical examinations and investigations namely haemoglobin %, total leucocyte count, differential leucocyte count, erythrocyte sedimentation rate, serum urea, serum creatinine, liver function test, fasting blood sugar, serum amylase, serum lipase, serum electrolytes, ultrasonography whole abdomen, and chest X-ray.

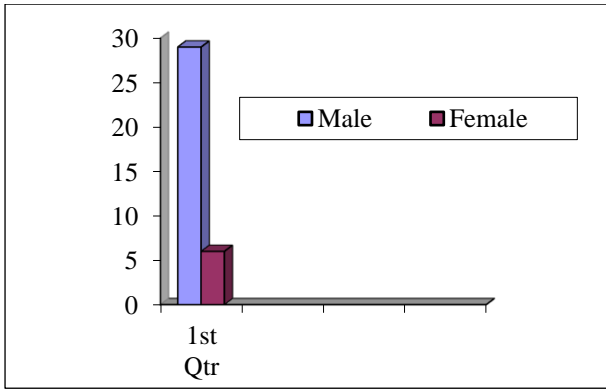
Patients were managed with fluid resuscitation, analgesics and supportive care. No antibiotics were used prophylactically. Patients were reviewed till the 3<sup>rd</sup> day regarding pain, tolerance to enteral feed and vital parameters (pulse, blood pressure, temperature, respiration, urine output) including investigations as needed. Patients with persistent pain abdomen, intolerance to enteral feed, or deranged vital parameters or abnormality on blood investigations suggesting severe disease (ex; raised serum urea and creatinine) were subjected to CECT whole abdomen to ascertain presence and extent of pancreatic necrosis and further management was done on the basis of CECT W/A report. Patients with severe acute pancreatitis were managed with bowel rest, oxygen, nasogastric drainage, parenteral antibiotics (ciprofloxacin or cefuroxime), parenteral opioids, nutritional support and organ support as indicated (laparotomy/referral to higher centre for ICU management). Patients who improved on conservative management, were pain free, and tolerated enteral feed were termed 'cured'. Patients of gallstone pancreatitis were managed with laparoscopic cholecystectomy before discharge i.e. during the same hospital stay.

All patients were followed up for 6 months following their admission for acute pancreatitis, and reviewed for recurrence of pain(requiring hospital admission), number of such episodes and/or any other complications and morbidities.

Statistical analysis was done by standard statistical methods for data compilation and analysis, tables, charts, graphs texts and software package like SPSS will be applied for statistical analysis.

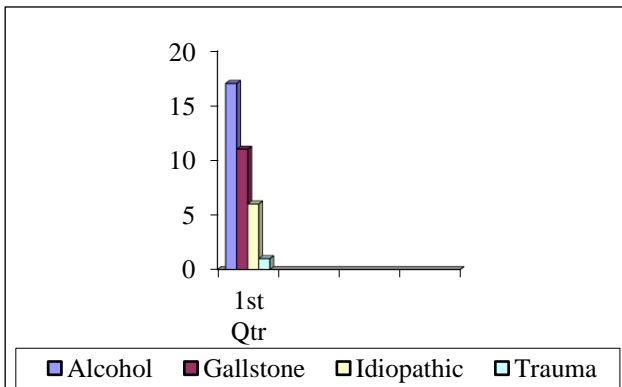
## RESULTS

As shown in the Figure 1, it is evident that acute pancreatitis is more common in the male population.



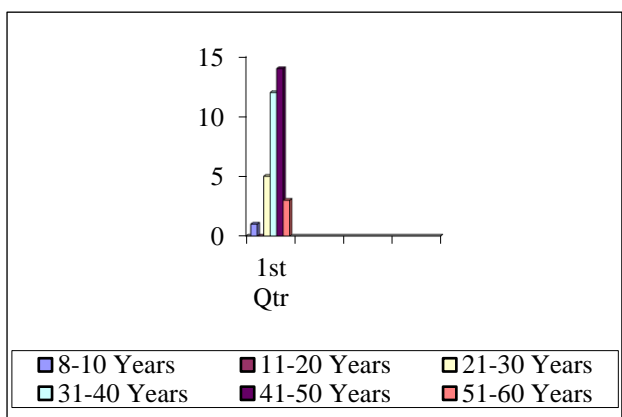
**Figure 1: Gender distribution.**

As shown in the Figure 2, alcoholism turned out to be the most common cause of acute pancreatitis in this series though there are varied reports in different studies.



**Figure 2: Prevalence of different etiological varieties.**

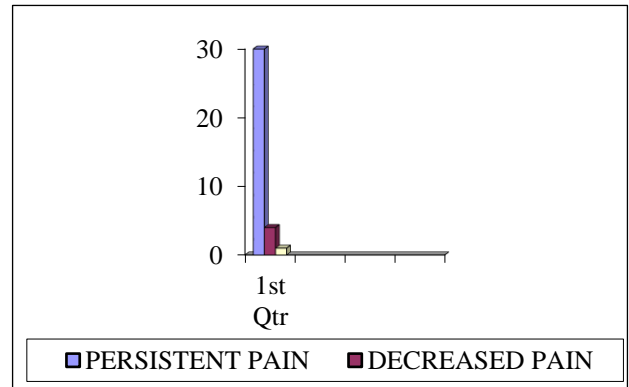
As shown in the Figure 3, majority of cases of acute pancreatitis occurred in the age group 31-50 yrs.



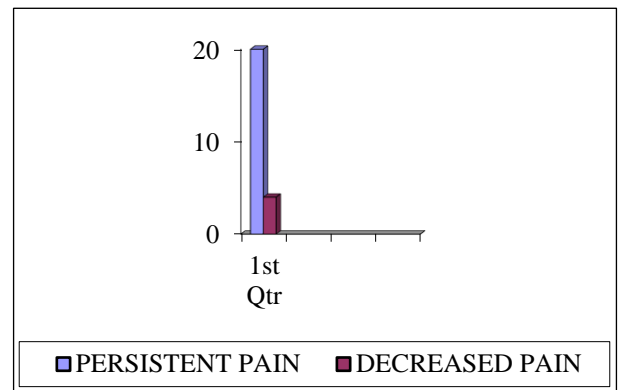
**Figure 3: Age distribution.**

As shown in the Figure 4, most patients had persistent pain after 1 day. Few patients showed improvement on conservative management. There was a single case of mortality. This patient had developed acute renal failure as a sequel to severe acute pancreatitis and despite

adequate fluid resuscitation and supportive management succumbed to his organ failure.

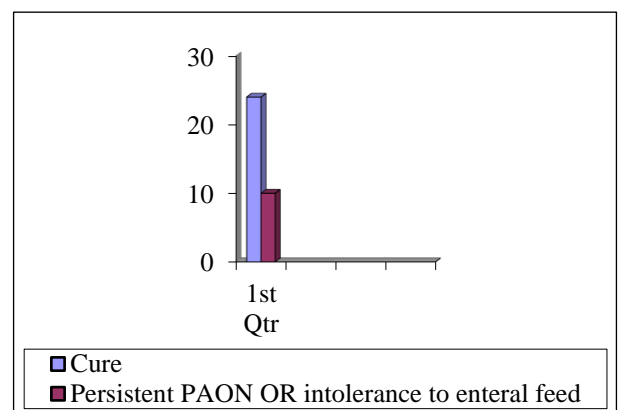


**Figure 4: Outcome on day 1.**



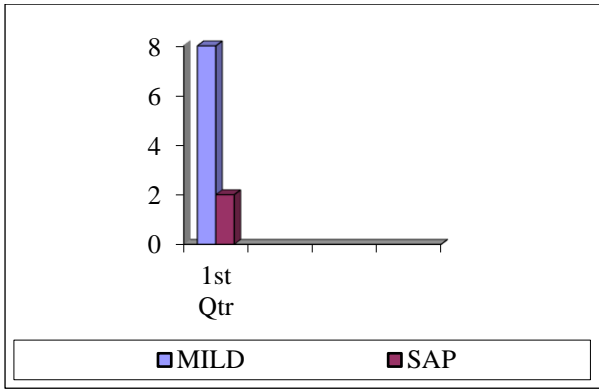
**Figure 5: Outcome on day 2.**

As shown in the Figure 5, after the second day and continued conservative management, more patients showed improvement.

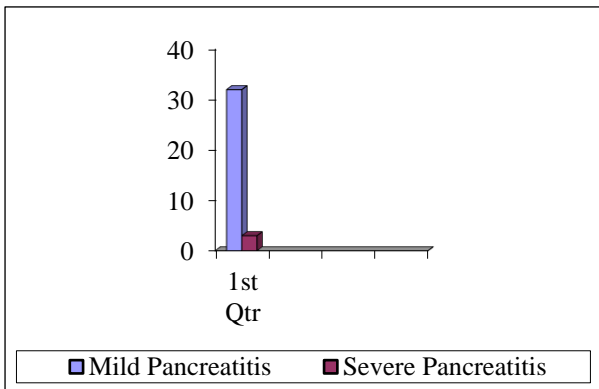


**Figure 6: Outcome on 3<sup>rd</sup> day.**

As shown in the Figure 6, after 3 days of conservative management, most patients had decreased pain and started tolerating enteral feed. 10 patients did not improve on day 3, and were candidates for CECT scan whole abdomen for further evaluation and ascertain presence of pancreatic necrosis if any.

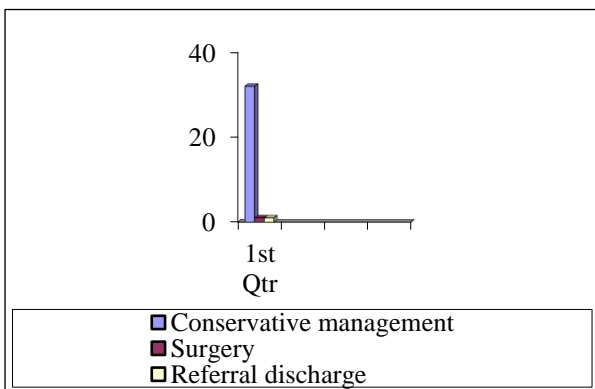


**Figure 7: CT scan findings.**



**Figure 8: Relative incidence of mild and severe pancreatitis.**

As shown in the Figure 7, of the 10 patients who did not show improvement on conservative management even after 3 days and underwent CECT Scan abdomen, only 2 patients had severe acute pancreatitis characterized by pancreatic necrosis. Rest 8 patients had interstitial pancreatitis or mild pancreatitis.

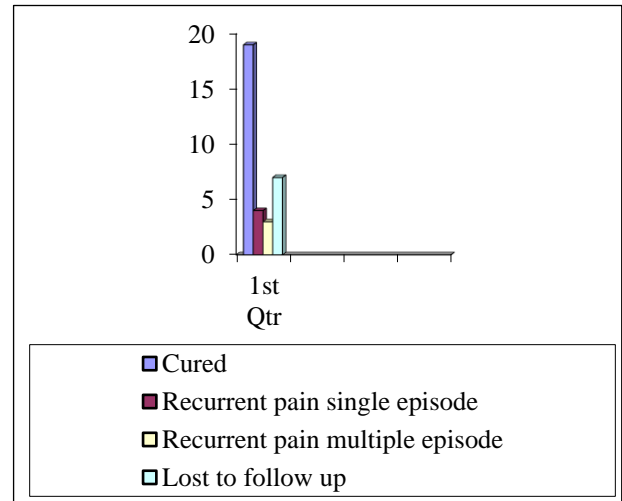


**Figure 9: Management needed.**

As shown in the Figure 8, majority of cases were mild pancreatitis and only 3 patients developed severe acute pancreatitis, 1 of whom died due to acute renal failure, 1 patient had to be referred to higher centre for ICU management for deteriorating condition and imminent

multi-organ failure and another patient underwent laparotomy and necrosectomy and recovered well thereafter.

As shown in the Figure 9, most patients needed only conservative management and improved sufficiently to tolerate enteral feed. One patient had to be referred to higher centre and one patient underwent laparotomy for pancreatic necrosis.



**Figure 10: Follow up on morbidities.**

As shown in the Figure 10, the patients were followed up for 6 months following the hospital admission for their episode of acute pancreatitis. Some were lost to follow up. Majorities were cured and did not experience any related morbidity. Some patients had recurrent pain needing one or more hospital admission and conservative management sufficed for them. Alcoholic pancreatitis patients are more likely to present with recurrent pain following the first episode.

## DISCUSSION

Pancreatitis is one condition a clinician encounters quite often in the emergency ward, though in different frequencies across the globe. The reasons are varied as is the clinical spectrum. The disease presents itself in different age groups and in different severities. The management strategies are dictated by etiology, severity and stage of presentation of the disease.

This observational study was conducted in Burdwan Medical College and Hospital; on patients admitted with acute pancreatitis during May 2012 to April 2012. Total 35 patients were enrolled for the study after conforming to the inclusion criteria and giving written consent for being included in the same.

Of the 35 patients, 29 were male and 6 patients were female, indicating a clear male preponderance. In most series, same is the observation, though not to the extent of a 4.83:1 ratio.<sup>4-6</sup> This may be contributed to the fact that

this being a rural based Medical College, alcoholism more prevalent in the male working population played a part in more male patients being admitted with acute pancreatitis, which is further supported in the findings of Table 2.

In this study, we found that alcohol was the most common etiological factor present in 48.57% of patients, whereas gallstones come second being present in 31.42% cases. Most textbooks cite western data, and most studies from the western world cite gallstones as the most common cause, with incidence varying between 40%, 50% and 30-60%.

In our study, 17.14% cases of acute pancreatitis had to be classified as idiopathic pancreatitis, as no readily identifiable cause was found. In most series, 10-25% cases are found to be idiopathic.<sup>7</sup> Though, the etiology should be defined in at least 20% of cases, as is specified in guidelines.<sup>8</sup> One interesting point to note in this study was the lone case of traumatic pancreatitis in a 9yr old boy. In different published reports, one of the most common causes of pancreatitis in children is trauma.

Among Indian studies, one found 60% cases being gallstone induced, while another found alcoholism as the most common cause.<sup>9</sup> The study that found alcoholism as the most common cause of acute pancreatitis was also from Eastern India (West Bengal, to be precise). So, if this points to a specific trend in this region needs to be evaluated in further larger studies.

From Figure 3, it is seen that most cases of acute pancreatitis tend to occur in the age group 41-50 yrs (40%) followed by 31-40 yrs (34.28%).

From Figure 4, it is seen that on day 1, i.e. after 1 day of conservative management few patients (11.4%) showed improvement, were pain free and tolerated enteral feed. 30 out of the total 35 patients i.e. 85.71% patients still had pain and were unable to resume diet. One patient died on day 1. Patient had developed acute renal failure, as a sequel of acute pancreatitis, and succumbed to it despite adequate resuscitative measures. Published data also indicates increased mortality in patients of acute pancreatitis who develop concomitant acute renal failure.

Figure 5 shows that after 2 days of conservative management, more patients improved clinically. 20 patients of the total 34 (58.82%) still had pain whereas 14 patients (41.18%) were pain free and tolerating diet.

Figure 6 shows that after 3 days of conservative management, only 10 patients remained who had complaints of pain and did not tolerate enteral feed. They were candidates for CT Scan abdomen for further evaluation and ascertain presence of pancreatic necrosis if any. There is reasonable indication that the distinct in between interstitial and necrotizing pancreatitis can be made much more readily when a contrast-enhanced CT

scan is obtained on the second or third day after admission rather than at the time of admission<sup>9</sup>. Moreover, since the study is being conducted in a rural based teaching hospital, cost of conducting a CT scan abdomen should also be kept in mind while advising so. Minimizing unnecessary advice of CT scan abdomen in all patients would be a prudent practice, particularly in this setting. So, conforming to the available guidelines, and keeping in mind the practical scenario, CT scan was only advised to patients not improving after 3 days of adequate conservative management.

Figure 7 shows that of the 10 patients who underwent CT scan abdomen 8 patients had mild acute pancreatitis, whereas 2 patients had severe acute pancreatitis. In 1992, the International Symposium on acute pancreatitis defined severe pancreatitis as the presence of local pancreatic complications (necrosis, abscess, or pseudocyst) or any evidence of organ failure.

Transfer to an intensive care unit should be considered if there are signs that suggest that the pancreatitis is severe or is likely to be severe. One patient of Severe Acute Pancreatitis had to be referred to higher centre for management in ICU setting, whereas the other patient declined referral to higher centre and had to undergo laparotomy for pancreatic necrosis. The types of surgery that have generally been recommended have included necrosectomy with closed continuous irrigation via indwelling catheter, necrosectomy and open packing, or necrosectomy with closed drainage without irrigation. There have not been randomized prospective trials comparing these procedures. All are generally considered to provide equal benefit in skilled surgical centers. That patient underwent necrosectomy and closed drainage, and improved well in the post operative period.

Figure 8 sums up the 35 patients to look for the relative incidence of mild and severe disease. Majority of cases were mild pancreatitis and only 3 patients developed severe acute pancreatitis, 1 of whom died due to acute renal failure, 1 patient had to be referred to higher centre for ICU management for deteriorating condition and imminent multi-organ failure and another patient underwent laparotomy and necrosectomy and recovered well thereafter. So, 8.57% patients had severe disease whereas 91.43% patients had mild disease. This correlates well with the published studies so far. 80% to 90% of patients with acute pancreatitis have interstitial pancreatitis with a mortality of only 1% to 3%<sup>26</sup>. Approximately 10% to 20% of patients with acute pancreatitis develop pancreatic necrosis. In one study from our country, 75% of the cases were mild pancreatitis whereas 25% were severe cases<sup>10</sup>.

Figure 9 sums up the management of the patients. 32 patient's i.e. 91.42% patients could be managed conservatively. One patient needed referral to higher centre and 1 patient needed surgical intervention. Mortality noted in this study in patients of acute



pancreatitis is 2.85%. There are varied reports regarding mortality in various studies.

Figure 10 depicts data of follow up on morbidities. The patients were followed up for 6 months following their admission for acute pancreatitis, and reviewed for recurrence of pain (requiring hospital admission), number of such episodes and/or any other complications and morbidities. 19 of the 33 patients (excluding the single mortality and the patient who was referred to higher centre) i.e. 57.57% of the patients did not experience any further episode of pain abdomen necessitating hospital admission. 4 patients i.e. 12.12% experienced a single episode of pain necessitating hospital admission. Three patients i.e. 9.09% experienced a multiple episodes of pain necessitating hospital admissions. There were total 6 patients with recurrent pain among the patients with mild acute pancreatitis i.e. 18.75%. In a similar study from Eastern India the rate of relapse of pain in the patients of mild pancreatitis was 29.41%<sup>10</sup>.

Our study shows that alcoholism is again the most common cause of recurrent pain in patients of mild acute pancreatitis, causing 83.33% cases. Data obtained in a study from Eastern India<sup>10</sup> puts the figure at 80%. So, alcoholics who develop a bout of pancreatitis are more prone to have relapsed of the disease those patients who had pancreatitis due to some other etiology.

Studies also say that most cases respond well to conservative management but a small yet significant sub group (10-20%) develops severe acute pancreatitis characterized by severe parenchymal necrosis of the gland and subsequent multi organ failure and contribute to the mortality (15-20%) of the disease.<sup>10,11</sup>

## CONCLUSION

This study was done to estimate the incidence of different etiological varieties of acute pancreatitis, to estimate the incidence of mild and severe acute pancreatitis and accordingly necessity for CT scan, to estimate the outcome in terms of cure, recurrence, morbidity and mortality. 35 patients of acute pancreatitis were enrolled for the study. They underwent thorough clinical evaluation and laboratory investigations to confirm the diagnosis, to ascertain the etiology and assess the severity. The patients were started on conservative management and continue for 3 days. Patients who did not improve by this time underwent CT scan Whole Abdomen to look for pancreatic necrosis if any.

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