

CLINICAL STUDY OF ACUTE PANCREATITIS WITH SPECIAL REFERENCE TO RANSON'S PROGNOSTIC CRITERIA

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ABSTRACT

INTRODUCTION

The pancreas is perhaps the most unforgiving organ in the human body and with its critical endocrine functions and its exocrine portion is a major source of extremely potent digestive enzymes. Pancreatic diseases are very complex and acute pancreatitis is associated with high morbidity and mortality rates. Early diagnosis of pancreatitis, its severity evaluation and adequate intensive care are highly essential for the reduction in morbidity and mortality. There are various criteria to assess the severity of acute pancreatitis like Ranson's criteria, The Acute Physiology and Chronic Health Evaluation II (APACHE II) score, Glasgow score etc. Ranson's criteria is most frequently and accurate method to assess the severity and mortality associated with acute pancreatitis because of its relative easy tabulation and resulting scores well correlated with morbidity and mortality.

OBJECTIVES

To study the clinical presentation, complications and prognosis of patients with acute pancreatitis during the study period.
To study the correlation of Ranson's criteria in acute pancreatitis with prognosis of the patient.

METHODS

Prospective study conducted in period ranging from November 2012 to October 2014 who admitted in JSS Hospital, Mysore in the Department of surgery satisfying inclusion criteria were taken into study.

RESULTS

Patients with low Ranson's score had shorter hospital duration and majority recovered by the time of discharge. High Ranson's score predicts long hospital stay and increased morbidity and mortality. In our study it predicted long hospital study but could not predict significant morbidity or mortality.

CONCLUSION

Ranson's criteria is the best prognostic tool in assessing the severity of the acute pancreatitis and also defines the need for early aggressive management in acute severe pancreatitis to reduce morbidity and mortality.

KEYWORDS:

APACHE - acute physiology and chronic health evaluation, LFT - liver function test, LDH - lactate dehydrogenase, CT - computed tomography, CECT - contrast enhanced computed tomography, MODS - multi organ dysfunction syndrome, ARDS - acute respiratory distress syndrome, DAMA - discharge against medical advice.

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INTRODUCTION: The pancreas is perhaps the most unforgiving organ in the human body and with its critical endocrine functions and its exocrine portion is a major source of extremely potent digestive enzymes. Consequently, diseases affecting the pancreas can wreak major havoc and can be the source of significant morbidity and mortality. A general truism from the practice of surgery is particularly apt: "You don't mess with the pancreas". Unfortunately, despite its physiologic importance, the retroperitoneal location of the pancreas and the generally vague signs and symptoms associated with its injury allow

many pancreatic diseases to progress undiagnosed for extended periods of time; recognition of diseases often requires a high degree of suspicion.

Pancreatic diseases are very complex and acute pancreatitis is associated with high morbidity and mortality rates. Its compounded with multiple aetiologies implicated in disease causation and sometimes there are no identifiable causes. The pathophysiology also remains incompletely understood. The varied clinical presentation of pancreatitis with multiple parameters to diagnose and prognosticate the severity of the disease, and its nonpredictable response to treatment makes the management of pancreatitis a complex one.

Early diagnosis of pancreatitis, its severity evaluation and adequate intensive care are highly essential for the reduction in morbidity and mortality.

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Acute pancreatitis includes a wide spectrum of disease, from one with mild self-limiting symptoms to fulminant processes with multiorgan failure and high mortality. An early discrimination between mild oedematous and severe necrotizing forms of the disease is of the utmost importance in order to provide optimal care to the patient. Because the associated mortality of severe acute pancreatitis approaches 40% and randomized studies have shown that early aggressive supportive care improves outcomes, attempts have been made to identify clinical parameters that predict patients risk of severe outcomes.

There are various criteria to assess the severity of acute pancreatitis like Ranson's criteria, The Acute Physiology and Chronic Health Evaluation II (APACHE II) score, Glasgow score etc. Ranson's criteria is most frequently and accurate method to assess the severity and mortality associated with acute pancreatitis because of its relative easy tabulation and resulting scores well correlated with morbidity and mortality.

AIMS AND OBJECTIVES:

1. To study the clinical presentation, complications and prognosis of patients with acute pancreatitis during the study period.
2. To study the correlation of Ranson's criteria in acute pancreatitis with prognosis of the patient.

MATERIALS AND METHODS: Prospective study conducted in period ranging from November 2012 to October 2014 who admitted in JSS Hospital, Mysore in the Department of surgery satisfying inclusion criteria were taken into study.

Inclusion Criteria: All patients diagnosed to have Acute pancreatitis admitted in JSS Hospital during the study period.

Exclusion Criteria:

1. Patients with chronic pancreatitis.
2. Pancreatitis due causes like Trauma, scorpion bite etc.,
3. Age less than 15 years.

Collection of data is from clinical history, physical examination, investigations and follow-up of the patient till discharge and complications associated with the disease when readmitted till 2 months.

The discharge status on each patient will be recorded as Improved, Deteriorated, Dead. The mortality rate with Ranson's criteria will be evaluated.

Demographics of the admitted patients were noted. Relevant history such as Alcoholism, Gall stone disease, Drug intake, Iatrogenic cause, Infections were noted.

Patients admitted with acute pancreatitis were subjected to blood investigations and imaging studies.

- Complete blood count.
- LFT, Serum amylase, serum lipase and serum LDH.
- Arterial blood gas analysis.
- Trans abdominal ultrasound.
- CT-abdomen.

All the patients were subjected to ultrasound and CECT (pancreas protocol).

STATISTICAL METHODS: The following statistical methods were applied in the present study;

1. Frequencies and percentages.
2. Cross tabs procedure (contingency coefficient test).

Frequencies- provides statistics and graphical displays that are useful for describing types of variables and crosstabs provides tests and association of two way tables. The statistical software, namely SPSS 15.0, Stata 8.0, MedCalc 9.0.1, and Systat 11.0 were used for the analysis of the data.

OBSERVATION AND RESULTS: The findings are based on the study of 150 cases of acute pancreatitis satisfying inclusion and exclusion criteria.

1. **Age/Sex Ratio:** Out of 150 patients 125 patients were male and 25 were female. Majority of the patients belonged to the age group distribution of 31-45(50%) and with the next common age group being 18-30 years (33.3%).

Age	Male	Female	Total
16-30	35(28%)	15(60%)	50(33.3%)
31-45	70(56%)	5(20%)	75(50%)
46-60	10(8%)	5(20%)	15(10%)
61-75	10(8%)	0(0%)	10(6.7%)
Total	125(100%)	25(100%)	150(100%)

Table 1

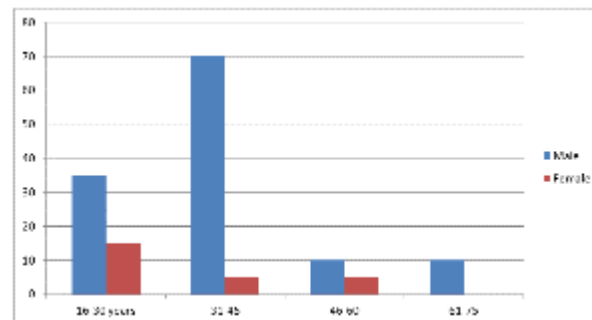


Fig. 1

2. **Clinical Features of Acute Pancreatitis:** Most common symptom of acute pancreatitis was pain abdomen which was seen in all patients (100%) with pain radiating to back in 76.6% of cases. The other associated symptoms were vomiting (73.3%), fever (16.6%), jaundice (6.6%) of cases. On examination all patients had abdominal tenderness and guarding (100%) and 23.3% patients had ascites.

Clinical features	Present	Percentage
Pain Abdomen	150	100%
Pain radiating to back	115	76.6%
Vomiting	110	73.3%
Jaundice	10	6.6%
Fever	25	16.6%
Tenderness and Guarding	150	100%
Ascites	35	23.3%

Table 2

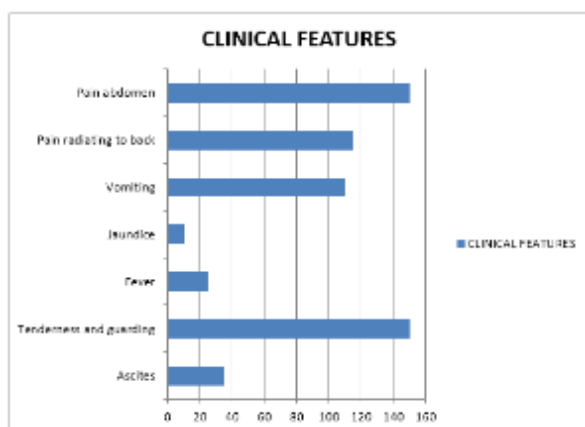


Fig. 2

3. Diagnostic Investigations: Of the blood investigations used to diagnose pancreatitis, Serum amylase was found to be raised in 93.3% of the cases while Serum lipase was raised in 94.1% of patients.

Of the radiological investigations, ultrasound of the abdomen diagnosed pancreatitis in 93.3% of the cases, while CT abdomen diagnosed in 92.3% of the cases.

Investigation	No. Of patients	Diagnostic	Percentage	Non-diagnostic	Percentage
S. amylase > 125u/l	150	140	93.3%	10	6.6%
S. lipase > 52u/l	85	80	94.1%	5	5.9%
USG abdomen	150	140	93.3%	10	6.6%
CT abdomen	65	60	92.3%	5	7.7%

Table 3

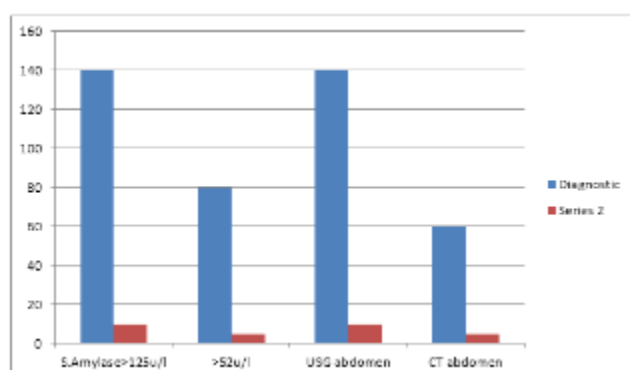


Fig. 3

4. Predisposing Factors: Alcohol was the single most common predisposing factor causing pancreatitis in 85 patients (56.6%) in our study. Gall stones were predisposing factor in 13.3% of patients. 20 patients (13.3%) had both alcohol and gall stones as the predisposing factor. 20(13.3%) patients were idiopathic pancreatitis while in 5 cases (3.3%) drugs were implicated as the predisposing factor.

Predisposing factors	No. Of patients	Percentage
Alcohol only	85	56.6%
Gall stones only	20	13.3%

Alcohol+ Gall stones	20	13.3%
Idiopathic	20	13.3%
Others	5	3.3%

Table 4

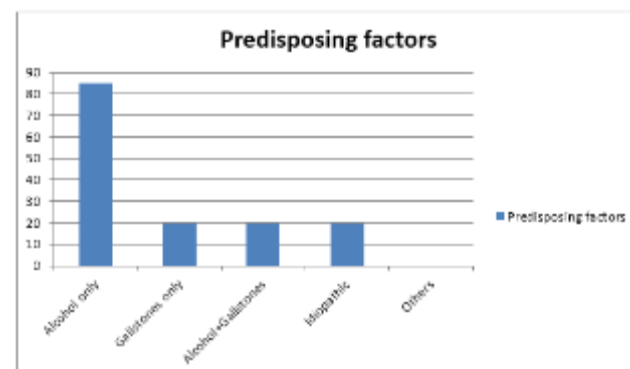


Fig. 4

5. Stay Duration: Majority of patients 50 in our study had hospital stay duration between 6-10 days. 30 patients (20%) had a stay duration of 16-20 days. 25 (7.3) patients were discharged within 5 days of admission and 15 patients (10%) had stay duration more than 25 days.

Stay duration-days	No. of patients	Percentage
<5	25	16.7%
6-10	50	33.3%
11-15	25	16.7%
16-20	30	20%
21-25	5	3.3%
>25	15	10%

Table 5

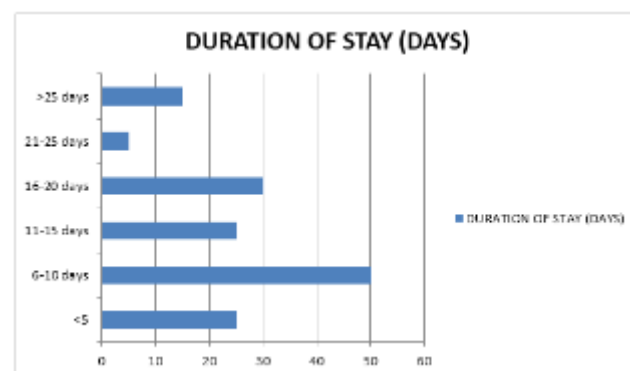


Fig. 5

6. Ranson's Criteria: 140 patients (93.3%) had Ranson's score of 0-3 with the mean duration of hospitalization being 11.6 days. 35 patients (25%) developed complications and 137 (96.4%) patients recovered and were discharged. 3 patients (3.6%) expired due to complications.

10 patients (6.7%) had Ranson's score of >3 with the mean duration of hospitalization being 25 days. 5 (50%) patients developed complications and 3 (30%) patients expired due to complications.

Ranson's score	No. of patients	Mean duration of stay	No. of patients with complications	Recovered	Death
0-3	140	11.6	35	137	3
>3	10	25	5	2	3

Table 6

7. Complications: In our study 25 patients(16.6%) had complications like Pseudocyst formation, 5 patients(3.3%) developed acute peripancreatic fluid collection and necrosis, 15 patients(10%) had developed ARDS, 5 patients(3.3%) had Renal failure, 15 patients(10%) had developed MODS (multiple organ dysfunction syndrome), and 5 (3.3%) patients developed internal haemorrhage.

130 patients (86.6%) recovered fully with symptom free at the time of discharge.

Complications	No. of patients	Percentage
Pseudocyst formation	29	19.3%
Peripancreatic fluid collection and necrosis	5	3.3%
ARDS	15	10%
Renal failure	5	3.3%
MODS	15	10%
Internal hemorrhage	1	0.67%
No complications	110	73.3%

Table 7

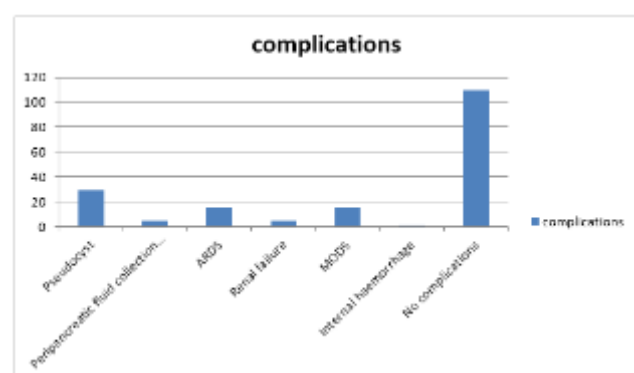


Fig. 7

8. Management: 140 patients were managed conservatively. 10 patients (6.67%) required surgical intervention. Out of 10 patients 5 patients underwent laparotomy and drainage of peripancreatic fluid collection which got infected and 3 patient underwent laparoscopic drainage of the pancreatic abscess and 1 patient underwent laparotomy and ligation of bleeding pancreatic vessel and 1 patient underwent endoscopic drainage of large acute pseudocyst.

Management	No. of patients	Percentage
Conservative	140	93.3%

Management (surgical)	No. of patients	Percentage
Laparotomy & drainage of infected collection	5	3.3%
Laparoscopic drainage	3	2%
Laparotomy & pseudoaneurysm ligation	1	0.6%
Endoscopic drainage of pseudocyst	1	0.6%

Table 8

9. Outcome: 130 patients recovered by the time of discharge while 5 patients discharged against medical advice and 9 patients discharged with minimal symptoms of pain and dyspepsia and 6 patients were expired due to sepsis and multiorgan failure.

Outcome	No. of patients	Percent
Recovered completely	130	86.6%
Discharged with minimal symptoms	9	6%
DAMA	5	3.3%
Death	6	4%

Table 9

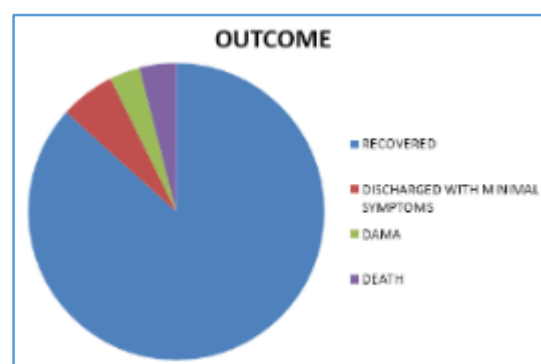


Fig. 9

10. Individual Parameters and their Significance: 140 patients (93.3%) had Ranson's score of 0-3 with the mean duration of hospitalization being 11.6 days. 35 patients(25%) developed complications and 137(96.4%) patients recovered and were discharged. 3 patients (3.6%) expired due to complications.

10 patients (6.7%) had Ranson's score of >3 with the mean duration of hospitalization being 25 days. 5(50%) patients developed complications and 3(30%) patients expired due to complications.

50 patients (33.3%) whose LDH level <500u/l had mean duration of hospital stay of 15.8 days and 10 patients (20%) developed complications and 7 patients recovered by the time of discharge and 3 patients were expired due to complications. 100 patients (66.6%) had LDH>500u/l had mean duration of hospital stay of 10.25 days with 30 patients developing complications and 27 patients recovered completely and 3 patients expired due to complications.

Individual parameters	No. of patients	Mean duration of hospital stay	No. of pts with complications	Outcome-death
Ranson's score				
<3	140	11.6 days	35	3
>3	10	25 days	5	3
LDH				
<500u/l	50	15.8 days	10	3
>500u/l	100	10.25 days	30	3
Pleural effusion				
Absent	105	11.8 days	10	0
Present	45	14 days	30	6
Table 10				

DISCUSSION: Out of 150 patients 125 patients (83.3%) were male and 25 patients (16.7%) were female. Majority of the patients were within age group 31-45 (50%) in accordance with the study done by Swaroop and Chari et al.¹

Symptomatology: Most common symptom was pain abdomen (100%), with pain radiating to back (76.6%). And all patients had abdominal tenderness and guarding (100%). Sheehy et al study showed that between 50 & 90% of patients have signs of abdominal distension or muscle spasms with epigastric pain and left upper quadrant tenderness.^{2,3}

Investigations: Serum amylase was found to be raised in 93.3% of cases while serum lipase was raised in 94.1% of patients. Ultrasound abdomen and CT abdomen diagnosed pancreatitis in 93.3% & 92.3% respectively. There is no significant correlation between the magnitude of serum amylase elevation and severity of pancreatitis. Gamaste V. V. et al and Barkin et al reported that although it lacks sensitivity (75-92%) and specificity (20-60%) measurement of the serum amylase level is most widely used method for diagnosing pancreatitis.⁴

According to the study conducted by Gamaste V. V, Specificity and sensitivity of Serum lipase was 50-99% and 86-100% respectively, which were better than amylase.

According to Fleischer AC and Williford ME et al abdominal ultrasound is the best way to confirm the diagnosis of gallstones in suspected biliary pancreatitis and the sensitivity of this study is 62-95%.^{5,6}

CT scan of the pancreas is more commonly used distinguish milder forms of the disease from severe necrotizing or infected pancreatitis.⁷

Predisposing Factors: Alcohol was the single most common predisposing factor causing pancreatitis (56.6%). Gallstones were next predisposing factor in 13.3% of patients. In 20 patients (13.3%) both alcohol and gallstones are the causative factors. According to Whitcomb DC, in the western world biliary tract disease and alcoholism are accountable for the majority of cases of acute pancreatitis. Drug induced pancreatitis is considered a rare event (0.1-2%) and is normally mild and self-limiting.⁸

Hospital Stay: Majority of the patients 100 in our study had hospital stay duration between 6-10 days(66.6%). 30 patients had (20%) had a stay duration of 16-20 days. 14 patients (9.3%) were discharged within 5 days of admission. 6 patients(4%) had stayed more than 25 days.

Ranson's Criteria: Morbidity and mortality of the disease are directly related to the number of signs present. If the number of positive Ranson's signs is less than two the mortality zero, with 3-5 positive signs mortality is increased to 10-20%. The mortality increases to more than 50% when there are more than 7 positive Ranson's signs. It is important to realize that Ranson's prognostic sign are best used within the initial 48 hours of the hospitalization and have not been validated for later time intervals.⁹

Our study 140 patients (93.3%) had Ranson's score of 0-3 with the mean duration of hospitalization being 11.6 days. 35 patients(25%) developed complications and 137(96.4%) patients recovered and were discharged. 3 patients(3.6%) expired due to complications.

10 patients (6.7%) had Ranson's score of >3 with the mean duration of hospitalization being 25 days. 5(50%) patients developed complications and 3(30%) patients expired due to complications.

Complications: In our study 25 patients(16.6%) had complications like Pseudocyst formation, 5 patients(3.3%) developed acute peripancreatic fluid collection and necrosis, 15 patients(10%) had developed ARDS, 5 patients(3.3%) had Renal failure, 15 patients(10%) had developed MODS (multiple organ dysfunction syndrome), and 5 (3.3%) patients developed internal haemorrhage.

According Ranson and Imrie et al, approximately 20-25% of the patients developing acute pancreatitis have the severe form of the disease in which respiratory insufficiency or failure is the clinical entity which is the most responsible for determining outcome.^{10,11,12}

Management: 140 patients were managed conservatively. 10 patients (6.67%) required surgical intervention. Out of 10 patients 5 patients underwent laparotomy and drainage of peripancreatic fluid collection which got infected and 3 patient underwent laparoscopic drainage of the pancreatic abscess and 1 patient underwent laparotomy and ligation of

bleeding pancreatic vessel and 1 patient underwent endoscopic drainage of large acute pseudocyst.

Ranson in 1989 reported that nasogastric aspiration has no role except in patients with severe pancreatitis with distended stomach to reduce nausea.

Outcome: 130 patients recovered by the time of discharge while 5 patients discharged against medical advice and 9 patients discharged with minimal symptoms of pain and dyspepsia and 6 patients were expired due to sepsis and multiorgan failure.

According to Larvin et al, death and major morbidity are rare in the group of patients with mild acute pancreatitis, while mortality ranging from 15-40% and morbidity of 50-60% are to be anticipated within the severe acute pancreatitis group.¹³

Individual Parameters and their Significance: 140 patients (93.3%) had Ranson's score of 0-3 with the mean duration of hospitalization being 11.6 days. 35 patients (25%) developed complications and 137(96.4%) patients recovered and were discharged. 3 patients(3.6%) expired due to complications.

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50 patients (33.3%) whose LDH level <500u/l had mean duration of hospital stay of 15.8 days and 10 patients (20%) developed complications and 7 patients recovered by the time of discharge and 3 patients were expired due to complications. 100 patients (66.6%) had LDH>500u/l had mean duration of hospital stay of 10.25 days with 30 patients developing complications and 27 patients recovered completely and 3 patients expired due to complications.

According Ranson and Imrie et al, approximately 20-25% of the patients developing acute pancreatitis have the severe form of the disease in which respiratory insufficiency or failure is the clinical entity which is the most responsible for determining outcome.^{10,11,12}

Markedly elevated serum lactate dehydrogenase levels >8.5mol/l or 500u/dl suggest a poor prognosis.

In the study by Uhl and co-workers LDH measurements detected 82% of necrotizing pancreatitis in a cohort of 52 patients (23 severe and 29 mild).¹⁴

105 patients (70%) had normal chest x-ray features and had mean hospital stay of 11.8 days with 10 patients (9.5%) developing complications and no mortality. 45 patients (33.3%) had pleural effusion either unilateral or bilateral and had mean hospital stay of 14 days with 30 patients of 45 (66.6%) developing complications and 6 patients expired due to complications.

CONCLUSION: 150 patients of diagnosed Acute pancreatitis were admitted to JSS hospital over a period of 2 years and the study of these patients revealed.

Majority of the patients belonged to the age group distribution of 31-45 (50%) and with the next common age

group being 18-30 years (33.3%) with male predominance (83.3%).

Most common symptom of acute pancreatitis was pain abdomen which was seen in all patients (100%) with pain radiating to back in 76.6% of cases. The other associated symptoms were vomiting (73.3%), fever (16.6%), jaundice (6.6%) of cases. On examination all patients had abdominal tenderness and guarding (100%) and 23.3% patients had ascites.

Alcohol was the single most common predisposing factor causing pancreatitis in our study. Gall stones were next common predisposing factor. Definite relationship exists between alcoholism, gallstone and pancreatitis.

Serum amylase and serum lipase was found to be useful with serum lipase being more reliable.

Ultrasound of the abdomen was the preferred initial investigation of choice to diagnose pancreatitis.

Ct scan abdomen is the gold standard investigation for assessing the severity of pancreatitis and progression of the disease and identification of the intra-abdominal complications.

Ranson's criteria were used for assessing the prognosis. Patients with low score had shorter hospital duration and majority recovered by the time of discharge. High Ranson's score predicts long hospital stay and increased morbidity and mortality. In our study it predicted long hospital study but could not predict significant morbidity or mortality.

The most common complication noted in our patients was pseudocyst formation and next common being respiratory complications like acute respiratory distress syndrome and few patients develop multiorgan dysfunction.

Majority of the patients were managed conservatively. Few patients required surgical intervention which were laparotomy and drainage of peripancreatic fluid collection, laparoscopic drainage of the pancreatic abscess, laparotomy and ligation of bleeding pancreatic vessel and endoscopic drainage of large acute pseudocyst.

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