A CLINICAL STUDY OF ACUTE PANCREATITIS
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BACKGROUND
Acute pancreatitis is one of the important causes of acute abdomen. The aim of the study is to analyse the aetiologies, the varying clinical presentations and prognosis of acute pancreatitis and to validate the clinical, biochemical and radiological signs in diagnosing acute pancreatitis.

MATERIALS AND METHODS
Total of sixty patients include both male and female of adult age group admitted in the emergency ward at Tirunelveli Medical College and Hospital with the symptoms of acute pancreatitis and evaluation confirmed the presence of the illness between February 2015 to August 2016. Severity assessment was based on clinical, biochemical and radiological findings.

RESULTS
In this study of 60 patients, most of the patients were alcoholic (90%). Abdomen pain (100%) and abdomen distension (42%) were the most common complaints. From this study, we can conclude that most of the attacks of acute pancreatitis were milder forms. In one patient, the CT abdomen showed normal pancreas associated with elevated serum amylase and lipase levels. Grades A and B accounted for more than 75% of the patients. Both CT grading and Ranson’s number are correlating directly with the severity of the disease. Total mortality was 8 out of 60 patients. All had Ranson’s score of 2 and 3.

CONCLUSION
Serum amylase and lipase has only role in diagnosis of acute pancreatitis. Ranson’s scoring and CT scan play a very important role in both diagnosis and assessment of severity of the disease.

KEYWORDS
Acute Pancreatitis, Ranson’s Criteria, CT Severity Index, Prognosis.

After the second week of illness, patients succumb to pancreatic infection associated with multiorgan failure.12

The significant variability in data indicates that the accurate measurement of the magnitude of problem is very difficult for the researchers. This is because of the following factors- 1) Lack of standardisation in diagnosing acute pancreatitis with the laboratory and clinical background; 2) Variation in the inclusion and exclusion criteria in different studies; 3) Regarding tools used for the consumption of alcohol; 4) Confusion between acute and chronic forms.

The interesting fact is that the incidence of alcohol-induced pancreatitis is increasing over the past decade. A study in United Kingdom shows that alcoholic pancreatitis incidence has increased from 14.5 per lakh population during 1989-1990 to 20.7 per lakh population in the year 1999-2002. Clinically, acute pancreatitis occurs only in 5% of heavy alcoholics.

About 3-8% patients with symptomatic biliary calculus can develop acute pancreatitis. The relative risk of developing acute pancreatitis in patients with the biliary stones is 35 times higher than the normal population. Biliary stone pancreatitis commonly occurs in woman and tends to occur in older age group.13

The development of pancreatitis is related to the stone size and its number. Patient can develop acute pancreatitis even with small, but multiple gallstones. It indicates migration of gallstones into the bile duct.13 High level of mucin in bile in patients with pancreatitis revealed that mucin enhances stone formation. In a study of 528 patients with biliary stones, acute pancreatitis is more prevalent in patients with smaller stones than obstructive stones. Some study shows about 80% of idiopathic pancreatitis were due to biliary stones.1617 Abnormalities of hepatic bile secretion and changes in the contractile function and mucosal properties of gallbladder contribute to formation of gallbladder sludge.18,19

Most of the acute pancreatitis patients had only milder forms, which can be managed conservatively and they recovered completely. The severe forms occurred only in 15% of patients. In recent studies, the mortality rate is greatly decreased from 35-85% to 10-20%. Severe acute pancreatitis has two stages of the disease. Initial inflammation and necrotic changes of the parenchyma is followed by signs of systemic inflammatory response syndrome leads to multiorgan failure within 7-10 days. About half of patients with severe forms of pancreatitis died in the first week due to complications like ARDS/MODS. The mortality rate in patients with MODS stage varies from 30% to maximum 100%. These patients need early resuscitation, intensive care to prevent multiorgan/respiratory failure.

CT as used to aid the diagnosis and staging of acute pancreatitis has greatly improved and has changed the clinical management of this condition.20,21 CT performed during the initial 12 hours may show only equivocal findings with a slight heterogeneous decrease in attenuation of the pancreas (ischaemia), but a normal parenchymal texture.22 The CT severity index is an attempt to improve the early prognostic value of CT in cases of acute pancreatitis.23 The utility of the Ranson’s criteria compared with that of the Balthazar CT criteria for detection of severe pancreatitis, CECT results were found to be better prognostic indicators owing to greater sensitivity and specificity.24 Extravasation of activated pancreatic enzyme induces the development of retroperitoneal fat necrosis.25,26

Some patients need surgical interventions like retroperitoneal drainage and necrosectomy in pancreatic necrosis and infected necrosis. To conclude the purpose of my study is to diagnose and assess the severity in patients with acute pancreatitis with clinical manifestations, laboratory investigations and imaging studies in our institution.

The aims of the study were to analyse the aetiologies and the varying clinical presentations of acute pancreatitis to validate the clinical, biochemical and radiological signs in diagnosing acute pancreatitis to correlate the severity of acute pancreatitis with the clinical, biochemical and radiological signs and to correlate the prognosis of the disease with the above-mentioned parameters.

MATERIALS AND METHODS

Total of sixty patients include both male and female of adult age group who got admitted in the emergency surgical ward with the symptoms of acute pancreatitis and evaluation confirmed the presence of this serious illness. The study was done in Tirunelveli Medical College and Hospital in Tirunelveli. The period of the study was from February 2015 to August 2016.

The inclusion criteria for the study was all patients who got admitted in the emergency surgical ward with the symptoms of acute pancreatitis in which the biochemical and radiological evaluation confirmed the presence of acute pancreatitis. Patients who had recurrent attacks of acute pancreatitis also included in this study.

The exclusion criteria used were patients with chronic pancreatitis are excluded from this study. Patients with known co-morbid conditions like diabetes mellitus, systemic hypertension, coronary artery disease, chronic obstructive pulmonary disease and chronic kidney disease were also excluded from this study. Patients in the paediatric age group were not included in this study.

The parameters used were clinical manifestations such as symptoms and signs and Ranson’s clinical scoring system, biochemical parameters like serum amylase and lipase and radiological using CT scan of abdomen plain and contrast. The diagnostic criteria used were clinical signs and symptoms of acute pancreatitis as described in review of literature, elevated serum amylase and lipase level, CT with contrast confirming the presence of acute pancreatitis.

Severity Assessment

Based on clinical (Ranson’s criteria), biochemical (serum amylase and lipase) and radiological (contrast-enhanced CT abdomen - Balthazar scoring) findings.
Ranson’s Prognostic Scoring System
A) Non-Gallstone Aetiology.

<table>
<thead>
<tr>
<th>During Admission</th>
<th>Within 48 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 55 years</td>
<td>Haematocrit fall &gt; 10%</td>
</tr>
<tr>
<td>TLC &gt; 16,000/mm2</td>
<td>Elevation of BUN &gt; 5 mg%</td>
</tr>
<tr>
<td>Blood sugar &gt; 200 mg%</td>
<td>Serum Ca++ &lt; 8 mg%</td>
</tr>
<tr>
<td>LDH &gt; 350 IU/L</td>
<td>PaO2 &lt; 55 mmHg</td>
</tr>
<tr>
<td>AST &gt; 250 U/dL</td>
<td>Base deficit &gt; 4 mEq/L</td>
</tr>
<tr>
<td></td>
<td>Fluid sequestration &gt; 6 litres</td>
</tr>
</tbody>
</table>

Table 1. Non-Gallstone Aetiology

B) Gallstone Aetiology

<table>
<thead>
<tr>
<th>During Admission</th>
<th>Within 48 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 70 years</td>
<td>Haematocrit fall &gt; 10%</td>
</tr>
<tr>
<td>TLC &gt; 18,000/mm3</td>
<td>Elevation of BUN &gt; 2 mg%</td>
</tr>
<tr>
<td>Blood sugar &gt; 220 mg%</td>
<td>Serum Ca++ &lt; 8 mg%</td>
</tr>
<tr>
<td>LDH &gt; 400 IU/L</td>
<td>Base deficit &gt; 5 mEq/L</td>
</tr>
<tr>
<td>AST &gt; 250 U/dL</td>
<td>Fluid sequestration &gt; 4 litres</td>
</tr>
</tbody>
</table>

Table 2. Gallstone Aetiology

TLC- Total leucocyte count, LDH- Lactate dehydrogenase. AST- Aspartate transaminase. BUN- Blood urea nitrogen. Ranson’s Score 3 or above defines severe pancreatitis. CT Scoring- (Balthazar).

Grading | Appearance | Score |
---------|------------|-------|
A        | Normal appearance | 0     |
B        | Focal or diffuse enlargement of pancreas | 1     |
C        | Peripancreatic inflammation | 2     |
D        | Intra/extra pancreatic fluid collection | 3     |
E        | 2 or more fluid collection/air in pancreas or retroperitoneum | 4     |

Table 3. CT Scoring - (Balthazar)

CT Necrosis Index
This is based on necrosis seen in the contrast-enhanced CT scan.

<table>
<thead>
<tr>
<th>Percentage of Necrosis</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% of necrosed pancreas</td>
<td>0</td>
</tr>
<tr>
<td>&lt;33% of necrosed pancreas</td>
<td>2</td>
</tr>
<tr>
<td>33-50% of necrosed pancreas</td>
<td>4</td>
</tr>
<tr>
<td>&gt;50% of necrosed pancreas</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4. CT Necrosis Index

CT severity index = CT Balthazar score + Necrosis index. Score 0-3 -------- Mild acute pancreatitis. Score 4-6 --------- Moderate acute pancreatitis. Score 7 or above ------ Severe acute pancreatitis.

OBSERVATIONS AND DISCUSSION
Clinical Manifestations and the Severity of the Disease
In this study, various clinical symptoms and signs were observed. The following clinical manifestations were commonly encountered.

All patients presented with abdominal pain (100%) and vomiting accounts for the next associated presentations (72%) and abdominal shock, guarding, rigidity, ascites, fever in remaining 48% present and mortality rate is 100% in patients presented with shock and guarding and rigidity.

From this result, the presence of haemodynamic instability is an important factor associated with poor prognosis. The presence of massive ascites is also having poor outcome. Those two patients who presented with significant guarding and rigidity had bad outcome in terms of mortality.

Serum Amylase and Lipase and the Severity of the Disease
Diagnosis by the serum amylase was specific in 70% of cases and by serum lipase - 93%.

In this study, serum amylase and lipase levels were elevated enormously in recurrent attacks even though they were milder forms. In case of severe pancreatitis, the levels of amylase and lipase show only mild-to-moderate elevation. Hence, it is obvious that there is no correlation between the levels of serum amylase and lipase and the severity of the disease.

Aetiology and the Severity of the Disease
In this study of 60 patients, most of the patients were alcoholic. The various aetiologies are listed below.

Most common aetiology is still the alcoholism in 55 cases and bile stones in 2 cases and periampullary carcinoma in 1 case and idiopathic in 2 cases.

Almost, all severe forms of pancreatitis were due to alcoholism. Misuse, problem use, abuse and heavy use of alcohol refer to improper use of alcohol, which may cause physical, social or moral harm to the drinker. Moderate use is defined by The Dietary Guidelines for Americans as no more than two alcoholic beverages a day for men and no more than one alcoholic beverage a day for women. Some drinkers may drink more than 600 mL of alcohol per day during a heavy drinking period. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines binge
drinking as the amount of alcohol leading to a Blood Alcohol Content (BAC) of 0.08, which, for most adults, would be reached by consuming five drinks for men or four for women over a two-hour period. According to the NIAAA, men may be at risk for alcohol-related problems if their alcohol consumption exceeds 14 standard drinks per week or 4 drinks per day and women may be at risk if they have more than 7 standard drinks per week or 3 drinks per day. Epidemiological evidence indicates a positive relationship between income and the prevalence of alcohol abuse in the general population, but an inverse relationship between income and alcohol dependence. Among those with a diagnosis of alcohol abuse, the most prevalent criterion is hazardous use.

The two cases with biliary stone as the aetiologic factor had milder form of acute pancreatitis. Of these sixty patients, only one patient developed pancreatitis in malignancy.

Gallstone pancreatitis or biliary pancreatitis is caused by transient obstruction of the ampulla of Vater by a migrating gallstone. The diagnosis of gallstone pancreatitis should be suspected if the patient has a prior history of biliary colic. Although, gallstone pancreatitis is the most common cause of pancreatitis, other aetiologies must be considered prior to initiating treatment. If the patient has a serum high ALT in a setting of acute pancreatitis one can be fairly sure that the aetiology is biliary, but a normal ALT does not exclude gallstones as a cause. The finding of gallstones and dilatation of the extrahepatic biliary tree on cross-sectional abdominal imaging lends further support to the diagnosis of gallstone pancreatitis.

Ranson’s Score and the Severity of the Disease

Ranson’s score was made and about 32 cases had score of 1, and 13 cases 2, and 10 cases more than 3. The mortality was in score 2 and >3 score with 20%. Most of the patients had Ranson’s score of 1 and 2. Out of 60 patients, 8 patients were expired. All of them had Ranson’s score of 1 and 2. From this, we can conclude that the severity of the disease correlate well with the Ranson’s score.

<table>
<thead>
<tr>
<th>Ranson’s Score</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 7. Ranson’s Score and the Severity of the Disease

Balthazar Score and the Severity of the Disease

The following table shows analysis of different CT scoring.

<table>
<thead>
<tr>
<th>CT Grading</th>
<th>Number of Males</th>
<th>Number of Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>46</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 8. Balthazar Score and the Severity of the Disease

CT grading by Balthazar scoring shows grading D and E with mortality 22% and 33%. From this study, we can conclude that most of the attacks of acute pancreatitis were milder forms. In one patient, the CT abdomen showed normal pancreas associated with elevated serum amylase and lipase levels. Grades A and B accounted for more than 75% of the patients.

Sex Difference and the Severity of Disease

Most forms of severe pancreatitis occurred in male patients. The severity between the sexes cannot be assessed correctly as the number of female patients in this study is insufficient.

Comparison between Ranson’s Scoring and CT Scoring in Severity of Disease

<table>
<thead>
<tr>
<th>CT Grading</th>
<th>Average Ranson’s Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Table 9. Comparison between Ranson’s Scoring and CT Scoring in Severity of Disease

Both CT grading and Ranson’s number are correlating directly with the severity of the disease. From this study, we can conclude that there is a linear progression between the Ranson’s scoring and CT scoring in assessing the severity of the disease as shown in the line diagram.

Duration of the Hospital Stay and the Severity of the Disease

<table>
<thead>
<tr>
<th>CT Grade</th>
<th>Duration of the Hospital Stay</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>10 days</td>
</tr>
<tr>
<td>B</td>
<td>7.7 days</td>
</tr>
<tr>
<td>C</td>
<td>10 days</td>
</tr>
<tr>
<td>D</td>
<td>6.5 days</td>
</tr>
<tr>
<td>E</td>
<td>11.5 days</td>
</tr>
</tbody>
</table>

Table 10. Duration of the Hospital Stay and the Severity of the Disease

The duration of the hospital stay does not correlate with the CT or Ranson’s grading as the patients with the higher grade had shorter hospital stay due to the death of the patients, which is because of the high mortality associated with the higher grades.

Ranson’s Score and the Mortality Rate

The eight patients who died had Ranson’s score of 2 or 3. Thus, the Ranson’s score is surely having an influence on the prognosis of the patient.

<table>
<thead>
<tr>
<th>Ranson’s Score</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 11. Ranson’s Score and the Mortality Rate
From this study, CT grading A, B and C show better prognosis when compared to grades D and E. CT grades D and E showed bad outcome in terms of mortality. In grade D, the mortality rate is 50% (3 out of 6 patients were expired). In grade E, the mortality rate is 75% (5 out of 6 were expired).

Correlation between Ranson’s and Balthazar grading shows increasing Ranson’s scoring along with CT grading with linear correlation CT-severing index shows with mortality of 44% in scoring 7-10. Among the mortality cases, the duration of death <1 week-62% and >1 week-38% and the cause of death in 1 week is ARDS, hypovolaemia, renal failure and 1 week septicemia. When compared with the international studies, it has been concluded that serum lipase is most diagnostic biochemical tool than serum amylase and alcohol being the most common aetiology. CT plays role in both diagnosis and assessing the severity and Ranson’s criteria had linear correlation with CT grading and predicting the prognosis.

Hill et al in 1983 conducted a study in which he studied a total of 83 patients. None of the patients in grade A and grade B died. But, 17% of grade D and 61% of grade E developed infected fluid collections and died. Clavien et al conducted a study for evaluation of 176 patients. From this study, he found that grade D and grade E had a protracted clinical course and development of most of the complications. In 1980 and 1983, Balthazar had conducted two separate studies. He found that CT scan is the most sensitive and specific in assessing the severity of the disease, the scoring is named after him.

The presence and extent of pancreatic necrosis and peripancreatic collections can be evaluated with equal accuracy compared with CECT. In fact, MRI is better in detecting mild acute pancreatitis and elucidating the cause of acute pancreatitis with high sensitivity and specificity for cholecholithiasis and congenital pancreatic anomalies. Due to its inherent tissue contrast resolution capability, MRI is superior to CECT in internal characterisation of pancreatic collections.

Management and Follow Up
All the patients were managed conservatively. None of the patients had indications for surgical management in the acute setting. The decision to operate on a patient with severe acute pancreatitis is often difficult and requires mature clinical judgment. Those indications that are widely accepted include:

1. For differential diagnosis, when the surgeon is concerned that the symptoms are the result of a disease other than pancreatitis for which operation is mandatory.
2. In persistent and severe biliary pancreatitis when an obstructing gallstone that cannot be managed endoscopically is lodged at the ampulla of Vater.
3. In the presence of infected pancreatic necrosis.
4. To drain a pancreatic abscess, if percutaneous drainage does not produce the desired result.

Other indications that are less well-defined and somewhat controversial are:

1. The presence of sterile pancreatic necrosis involving 50% or more of the pancreas.
2. When the pancreatitis persists in spite of maximal medical therapy.
3. When the patient's condition deteriorates often with the failure of one or more organ systems.

Cholecystectomy should be performed to avoid recurrence of gallstone-associated acute pancreatitis. In mild gallstone-associated acute pancreatitis, cholecystectomy should be performed as soon as the patient has recovered and ideally during the same hospital admission. In severe gallstone-associated acute pancreatitis, cholecystectomy should be delayed until there is sufficient resolution of the inflammatory response and clinical recovery. Endoscopic sphincterotomy is an alternative to cholecystectomy in those who are not fit to undergo surgery in order to lower the risk of recurrence of gallstone-associated acute pancreatitis. There is however a theoretical risk of introducing infection into sterile pancreatic necrosis. These guidelines should now form the basis for audit studies in order to determine the quality of patient care delivery.

In this study, out of the 60 patients, 8 patients were died. In the remaining 52 patients, only 20 patients came for the followup. Of these 20 patients, 6 male patients had recurrent pancreatitis and one male patient had recurrent attack. He developed pseudocyst of the tail of the pancreas. He underwent cystogastrostomy. Patient improved symptomatically after surgical intervention.

CONCLUSION
Serum amylase and lipase has only role in diagnosis of acute pancreatitis. So, the rise of serum amylase and lipase level cannot be used as a parameter to assess the severity of acute pancreatitis. Ranson’s scoring has important role in assessing the severity of acute pancreatitis. CT scan plays a very important role in both diagnosis and assessment of severity of the disease.
REFERENCES


