

Section **Surgery**

**Original** Article

# Ranson's Scoring System and Modified CT Severity Index in the Evaluation of Acute Pancreatitis: A Prospective Hospital Based Study

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## ABSTRACT

**Background:** Acute pancreatitis is an acute abdominal emergency condition that need immediate hospital stay and intensive care. In 80% of cases it runs a mild course and rest of the patients have severe pancreatitis. It's severity is assessed by using Ranson's scoring system and Modified CT severity index. This study was carried out to evaluate role of Ranson's scoring system and modified CT severity index in assessing severity of acute pancreatitis. **Methods:** - This is a prospective observational study which is conducted on patients with acute pancreatitis admitted in Department of Surgery, Geetanjali Medical College and Hospital, Udaipur. 30 patients of acute pancreatitis enrolled. Ranson's criteria and modified CT severity index apply to all of them. **Results:** Out of 30 patients, 20 patients have mild pancreatitis. 4 patients have moderate pancreatitis. 6 patients have severe pancreatitis. **Conclusion:** We conclude that Ranson's criteria and modified CT severity index have significant role in predicting the severity of acute pancreatitis and the chances of developing complications as regards morbidity and mortality.

**Keywords:** Ranson's scoring system, Modified CT severity index

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## INTRODUCTION

Acute pancreatitis is a common abdominal catastrophe. It is a disease with morphological and clinical manifestations which can present as mild interstitial pancreatitis to potentially fatal necrotizing pancreatitis. In majority of the patients i.e. nearly 80% it runs a mild course with minimum morbidity and mortality less than 2%. These patients can be sent home after 7 to 10 days of conservative management. In rest of the patients disease runs a severe course and mortality is directly proportional to development of complications either local or systemic. Conservative treatment does result in recovery but certain patients develop devastating illness leading to multiorgan failure. These patients need protracted hospital stay and intensive care and few patients require surgery to deal with consequences of pancreatic necrosis.

Assessment of severity is a key determinant in management of patients. Ranson's criteria and modified CT severity index specifically designed for acute pancreatitis. Both used for predicting the prognosis and to identify severely ill patients.

## METHODS

This study is a prospective observational study conducted in the Department of General Surgery, Geetanjali Medical College and Hospital, Udaipur. All patients admitted with history of pain upper abdomen and suspected to have acute pancreatitis due to surgical cause. Clinically will be further evaluated to confirm or rule out acute pancreatitis. The

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diagnosis of acute pancreatitis will be based on following criteria:

All patients suspected to be having acute pancreatitis on the basis of Clinical grounds, Biochemical parameters and Ultrasonographic imaging.

Following scoring systems are taken into consideration for assessing severity of acute pancreatitis:

1. Ranson's scoring system.
2. Modified CT severity index.

Patients with Ranson's score of 3 or more on admission or at 48 hours are considered to be having severe pancreatitis. Contrast CT scan: - Contrast CT scan abdomen is done within 48 hours and modified CT severity index is calculated. Modified Ct severity index differs from CT severity index by including presence of extra pancreatic Complications and grading the peripancreatic fluid collection in terms of present or absent, instead of number of peripancreatic fluid collection as done in CT severity index. The grading of necrosis is also different.

The patients will be considered as having acute severe pancreatitis if they develop local complications, organ failure because of acute pancreatitis.

#### The features suggesting organ failure include

1. Renal failure: Urine output of <20 ml/h x 24 hrs despite adequate volume replacement
2. Respiratory failure: PO<sub>2</sub> < 60mmHg.
3. Cardiogenic shock, systolic B.P < 100mmHg refractory to fluid therapy and requiring inotropic agents for > 12 hours.
4. Coagulopathy: PT or a PTT two times that of control.
5. Gastrointestinal bleed > 500ml/24 hr.

## RESULTS

Out of 30 patients, 18 females and 12 males. 25 patients were found to be less than 70yrs of age and 5 patients more than 70yrs of age. Out of 18 females, 15 were less than 70yrs and 3 more than 70yrs of age. Out of 12 males, 10 males less than 70yrs of age and 2 more than 70yrs of age. 22(68%) patients have mild pancreatitis. 2(12%) patients have moderate pancreatitis. 6(20%) patients have severe pancreatitis. 10 patients developed pleural effusion, 4 patients developed hypocalcaemia, 6 patients developed ascites.

#### Ranson's criteria applied to all patients

In 5 variables studied at admission, age less than 70yrs was found to be most frequent. Variable studied at 48 hours showed Base deficit to be most frequent. Ranson's score of 0-2 present in 20 patients. All patients discharged. No death and no complication occurred. Ranson's score of 3-4 present in 04 patients. All 10 developed pleural effusion and 04 developed hypocalcaemia.

Ranson's score of 5-6 present in 5 patients. N=3 patients developed pleural effusion and hypocalcaemia and 2 patients developed ascites.

Patients: -

Score of 0-2 present in 20 patients. Pancreatic inflammation present in all of them.

Score of 4-6 present in 4 patients. 2 patient developed pancreatic necrosis more than 30% and 2 developed necrosis less than 30%. All developed pleural effusion and 2 patients developed pancreatic inflammation.

Score of 8-10 present in 06 patients. All developed pleural effusion, 06 patients developed ascites. 6 patients developed peripancreatic fat necrosis and pancreatic necrosis more than 30%.

#### Ranson's criteria for acute gallstone pancreatitis

At Admission	At 48 hours
Age>70 yr	Hematocrit fall>10%
WBC>18,000/cumm	BUN elevation>2 mg/dl
Blood sugar>220 mg/dl	Serum calcium<8 mg/dl
Serum LDH>400 IU/L	Arterial PO <sub>2</sub> <60 mmhg
Serum AST>250 IU/L	Base deficit>5 meq/l
	Estimated fluid sequestration > 4L

#### Modified computed tomography

Criteria	Points
Pancreatitis inflammation	
Normal Pancreas	0
Inflammation of pancreas & or peripancreatic fat	2
Pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis	4
Percentage necrosis	
0%	0
<-30%	2
>30%	4
Extra pancreatic complication (EPC)	
Pleural effusion, ascites vascular Complication	
Extrapancreatic parenchymal abnormalities GI Tract involvement	2
Modified CT severity index = CT grade + % nec + EPC	
Mild	0 to 2
Mod	4 to 6
Severe	8 to 10

Table 1:- Ranson's score and outcome.

Score	No. of Patients	Discharge	Complications
0-2	20	20	Nil
3-4	04	04	Pleural effusion in 3 patients, hypocalcaemia in 1 patient
5-6	05	05	Pleural effusion, hypocalcaemia in 3 patients, ascites in 2 patients
7-8	01	01	Pleural effusion, hypocalcaemia, ascites

**Table 2:- Modified CT severity index and outcome.**

Score	No. of patients	Pancreatic inflammation	Peripancreatic fat necrosis and peripancreatic fluid collection	Pancreatic necrosis	Ascites	Pleura effusion
0-2	20	20	Nil	Nil	Nil	Nil
4-6	04	02	00	04	Nil	04
8-10	06	00	06	6	04	06

**Table 3:- Complications due to pancreatitis**

Pleural effusion	10 patients
Ascites	06 patients
Hypocalcaemia	04 patients

## DISCUSSION

Acute pancreatitis is an inflammatory process with exceptionally factor course that warrants earnest and escalated care to keep the entanglements or to manage them and along these lines lessening the dreariness and mortality. Evaluation of seriousness and guess is vital to choose about the administration and extra those with mellow infection from expensive and intrusive convention. Ranson's criteria is easy as all biochemical and haematological parameters can be easily done and are economical. Toth has mentioned that presence of 3-4 signs at admission is associated with mortality of 15-20%. If score is 7 or more, mortality approaches 100%. In our study survival was 100% at lower score though death occurred at higher score. Horzic et al reported a study of 43 patients. Those with less than 3 signs were classified as mild. Those having 3 or more signs were considered as having severe disease. 60% of the patients in latter group survived. Those who died have more than 6 signs. 8 Patients Developed multiorgan failure. It was concluded that Ranson's criteria was more certain in predicting the outcome when more factors were present. In our study complication rate was found to increase with increase in number of scores. The introduction of modified CT severity index was a significant advance in the assessment of patients with acute pancreatitis. Bollen et al worked on modified CT severity index for the assessment of severity of acute pancreatitis. The study showed modified CT severity index was 71% sensitive and 93% specific. Irshad Ahmed Banday et al have studied 50 patients. 33 were male and 17 were female. Cholelithiasis was most common etiological factor in 40% cases.

Alcoholic pancreatitis in 36% cases. Pleural effusion was most common complication present in 28 patients followed by ascites. 18% patients having mild pancreatitis, 38% having moderate pancreatitis and 44% having severe pancreatitis. In our study, 16 patients having pleural effusion and 8 patients having ascites. Complication rate increases with higher score.

## CONCLUSION

We conclude that Ranson's criteria and modified CT severity index play important role in assessing the severity of acute pancreatitis and helpful in early prediction of complications associated with acute pancreatitis. Thus, making the timely treatment possible, help to reduce the morbidity and mortality.

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