



## Comparative Study between Extent of Necrosis and Organ Failure Rates in Acute Pancreatitis

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### ABSTRACT

*Acute pancreatitis is one of the most common cause for upper abdominal pain. it can be a mild or severe attack. Mild pancreatitis will not produce much complication. But severe pancreatitis usually associated with complication like pseudocyst or necrosis. In this study we tried to study the relation between extent of necrosis and organ failure*

**KEY WORDS:** *Acute pancreatitis. necrosis. organ failure*

### INTRODUCTION

Acute pancreatitis is an inflammatory process of pancreas characterised by abdominal pain, vomiting. Diagnosed by history, clinical features and investigation. Most cases have self limited course. 10 to 20 percentage of cases associated with high morbidity and mortality. Most common cause of death in pancreatitis is multiorgan dysfunction syndrome within 2 weeks and septic complication after 2 weeks. In assessing the severity of acute pancreatitis Ranson's scoring system is introduced in 1974. The other scoring system used are APACHE-II, Balthazar and C T severity index. In this study we tried the correlation of extent of inflammation and necrosis

using C T severity index with organ failure as in modified ATLANTA criteria in acute pancreatitis. Pancreatic necrosis is defined as presence of one or more focal or diffuse areas of nonviable pancreatic parenchyma. Contrast enhanced C T scan is the gold standard for diagnosing pancreatic necrosis. Infection is the most important complication of necrosis. Necrosis is diagnosed by fine needle aspiration with gram stain and culture. Definition of organ failure transient if the organ failure resolves within 48 hours or persistent if organ failure persisted for more than 48 hours. If organ failure affects more than one organ system it is termed as multiple organ failure.

### MODIFIED MARSHAL SCORING SYSTEM

Organ system	0	1	2	3	4
Respiratory Po <sub>2</sub> /Fio <sub>2</sub>	> 400	301-400	201-300	101-200	<101
Renal Serum creatinine mg/dl	<1.4	1.4-1.8	1.9-3.6	3.6-4.9	>4.9
Systolic blood pressure mmHg	>90	>90 Fluid responsive	>90 Not Fluid responsive	>90 PH<7.3	>90 PH<7.2

Sign of systemic inflammatory response syndrome  
Heart rate >90  
Temperature <36 or >38  
White blood count <4000 or > 12000mm<sup>3</sup>  
Respiration >20/min

### OUTCOME MEASURES

The clinical course of these patients will be followed up until the completion of their hospital stay or till death whichever is earlier will be assessed. The impact of organ failure and necrosis on mortality and morbidity will be studied. Morbidity will be measured depending on the day 30 and day 60 survival, incidence of sepsis related complication, organ dysfunction/failure, frequency of hospital admission, duration of ICU stay, hospital stay, duration of mechanical ventilation, need for other supporting measures and course of pancreatitis

### METHODS

All patients diagnosed to have acute pancreatitis will be assessed clinically, biochemically and radiologically, serum amylase. Lipase, routine. LFT, RFT, complete blood count including haematocrit will be assayed on admission and repeated when necessary. Etiological work up for acute pancreatitis will be done for all patients. All patients will be followed up daily with modified Marshal scoring system for assessing organ failure. Local complications will be assessed using parameters used for assessing systemic inflammatory response syndrome. CECT abdomen will be taken 5-7 days after the onset of acute pancreatitis and will be repeated if clinically warranted and their CT severity index will be recorded. The clinical course of these patients will be followed until the completion of their hospital stay or till patients demise whichever is earlier will be assessed. The impact of organ failure and necrosis on mortality and morbidity will be studied. Morbidity will be measured depending on the day 30 and 60 days survival, incidence of sepsis related complications, organ dysfunction/failure, frequency of hospital

admission, duration of ICU stay, hospital stay, duration of mechanical ventilation, need for other life supporting measures and course of pancreatitis

### OBSERVATIONS

#### DEMOGRAPHIC PROFILES

##### Sex distribution

Sex	Number	Percentage
Male	90	86.5
Female	14	13.5
Total	104	100

In our study 86.5% were males and 13.5% were females

#### SOCIOECONOMIC STATUS

	Number	Percentage
Manual Labourer	49	47.1
Drivers	14	13.5
Govt employees	4	3.8
House wives	13	12.5
Others	24	23.1
Total	104	100

Main group affecting are manual labourers of poor socioeconomic status (47.1%)

#### ETIOLOGY OF PANCREATITIS

Etiology	Number	Percentage
Alcoholic pancreatitis	59	56.7
Gall stone pancreatitis	13	12.5
Others	20	19.2
> one etiology	12	11.5
Total	104	100

In our study 56.7% pancreatitis were alcohol induced 12.5% were gall stone pancreatitis. 11.5% were having more than one etiology

#### Symptoms

Symptoms	Number	Percentage
Abdominal pain	1	10
Abd.pain + nausea	9	8.7
Abd.pain+ nausea+vomiting	37	35.6
Abd.pain+nausea+vomiting+dyspepsia	57	54.8
Total	104	100

Majority of patients presented with abdominal pain, nausea, vomiting, and dyspepsia

**SIGNS**

SIGNS	No	%
Tenderness	11	10.6
Tenderness+guarding	18	17.3
Tenderness+guarding+ rigidity	18	17.3
Tenderness+guarding+rigidity+mass	15	14.4
Tenderness+guarding+rigidity+ascites	24	23.1
Tenderness+guarding+rigidity+ileus	12	11.5
Tenderness+guarding+rigidity+mass+ileus+ascites	6	5.8
Total	104	100

Majority of the patients were having more than 2 signs (72%)

Follow up

Only 4 persons out of 104 died during 90 days follow up

Hospital stay

Mean duration of hospital stay was 8.48 days ranging from 1 to 30 days

**SIRS**

SIRS	Number	Percentage
Absent	100	96.2
Present	4	3.8
Total	104	100

Patients with established SIRS the mortality is 100 %

**SYSTEMIC COMPLICATION**

Systemic complication	Number	Percentage
0	1	1
1	58	55.8
2	45	43.3
Total	104	100

In our study 43.3% patients were having systemic complications

**ORGAN FAILURE**

No.of organ failure	Number	Percentage
0	59	56.7
1	25	24
2	15	14.5
3	5	4.8
Total	104	100

56.7% patients were not having any organ failure.24% were having single organ failure.15% were having 2 organ failure. Only 4.8% were having 3 organ failure

**COMPARISON BETWEEN ORGAN FAILURE AND CTSI**

CTSI Score		Organ Failure		Total
		Absent	Present	
-	Number	40	3	43
1-6	% Within CTSI	93%	7%	100%
-	% within Organ Failure	88.9%	5.1%	41.3%
	Number	5	56	61%
7-10	% Within CTSI	8.2%	91.8%	100%
-	% within Organ Failure	11.1%	94.9%	58.7%
-	Number	45	59	104
Total	% Within CTSI	43.3%	56.7%	100%
	% within Organ Failure	100%	100%	100%

**Mechanical ventilation**

Mechanical ventilation	number	percentage
1	101	07.1
2	3	2.9
Total	104	100

Only 2.9% patients were mechanically ventilated while majority 97.1% patients were treated without ventilation

**ATLANTA CRITERIA**

Atlanta score	Number	Percentage
Severe	31	29.8
Moderate	14	13.5
Mild	59	56.7
Total	104	100

56.7% were having mild pancreatitis, 13.5% moderate pancreatitis and 31% sever pancreatitis

**CTSI category**

CTSI category	Number	Percentage
0-3	28	26.9
4-6	33	31.7
7-10	43	41.3
Total	104	100

41.3% had sever pancreatitis 31.7% had moderate and 26.9% had mild pancreatitis

**COMPARISON OF CTSI WITH ORGAN FAILURE SEVERITY**

CTSI		organ failure severity			Total
		Mild	moderate	severity	
Mild	Number	26	2	0	28
	% Within CTSI	92.9%	7.1%	0%	100
	% within Organ severity	44.1%	14.3%	0%	26.9%
moderate	Number	30	1	2	33
	% Within CTSI	90.9%	3%	6.1%	100%
	% within Organ severity	50.8%	7.1%	6.5%	31.7%
severity	Number	3	11	29	43
	% Within CTSI	7%	25.6%	67.4%	100.0%
	% within Organ severity	5.1%	78.6%	93.5%	41.3%
Total	Number	59	14	31	104
	% Within CTSI	56.7%	13.5%	29.8%	100%
	% within Organ severity	100%	100%	100%	100%

**DISCUSSION**

One hundred and four (104) patients admitted with a diagnosis of acute pancreatitis in government medical college Kozhikode participated in this study. all of them taken spiral computed tomography scan with intravenous contrast. In these patients we had compared the extent of inflammation and necrosis using computed tomography severity index with organ failure as in modified atlanta criteria in acute pancreatitis.

In our study about 86.5% affected were males and 13.5 were females. In our study 56.5% of people developed acute pancreatitis due to alcohol intake, 12.5% due to gall stones. In 11.5% persons there were multiple etiology. Age group of the patients ranged from 14 years to 78 years with mean age of 40.5 years

In our study 45 patients were diagnosed have moderate to severe pancreatitis. 31 patients developed persistent organ failure. the average

length of the average length of hospital stay was 8 days (ranging from 1 to 30 days). 8.7 % needed ICU care .In our study 4 patients died during 90 days follow up

CTSI was able to predict 73% morbidity in acute pancreatitis .it has 84.2% sensitivity, 90.6% specificity in predicting pancreatic necrosis. In our study the sensitivity and specificity of CTSI in predicting the organ failure was 88.9 and 94.9. CTSI has high sensitivity and specificity in predicting the organ failure rates

In our study 28 patients (26.9%) found to have CTSI 0-3 that is having mild pancreatitis .of this 26 (92.9%) patients were having organ failure severity of mild nature according to Modified Atlanta Criteria. 2 (7.1%) patients were having moderate organ failure severity and none had Modified Atlanta criteria severe.

In our study 33 patients (31.7%) found to have CTSI 4-6 (moderate pancreatitis). Of these 30 (90.9%) patients were in mild organ failure

category, whereas 3% patients belonged to moderate acute pancreatitis as per Modified ATLANTA and 6.5% had severe organ failure.

In severe acute pancreatitis as per CTSI (&!)) Out of 43 (41.3%) patients only 3 (7%) belonged to mild acute pancreatitis as per modified Atlanta criteria, whereas 29 (67.4%) persons belonged to severe acute pancreatitis as per modified Atlanta criteria

Comparing these results we can say that if CTSI is low (0-3) majority of the patients are having mild acute pancreatitis as per modified Atlanta criteria .patients with moderate pancreatitis CTSI (4-6) were not much different from that of mild CTSI patients

CTSI is high (7-10) majority of the patients are having severe pancreatitis as per modified Atlanta criteria

## CONCLUSION

There is good correlation of extent of inflammation and necrosis using CTSI with organ failure as in modified Atlanta criteria in mild and severe acute pancreatitis. In moderately severe acute pancreatitis, these are not correlating .Moreover CTSI seems to be over diagnosing the severity of acute pancreatitis in terms of organ failure

The incidence of organ failure in acute pancreatitis patients were 43.3%

This study suggest the evaluation of dynamic steps involving prediction of future outcomes in acute pancreatitis, following modified Atlanta criteria not contributing to our understanding because of these three divisions like mild, moderate ,severe. Comparing of these two systems CTSI and Modified Atlanta criteria a more simplified version will be dividing the severity scores into mild and severe acute pancreatitis.

## REFERENCES

1. Sabiston textbook of surgery,19 edition
2. Classification of acute pancreatitis 2012 .revision of atlanta classification
3. Keer JB.Atlas of functional histology. Chapter 14 .London,Mosby 1999
4. Orci L.A portrait of the pancreatic B-cell.Diabetologica 1974 ;10: 163-187
5. Grays anatomy
6. Whitecomb DC .Clinical practice .Acute pancreatitis .n Engl J Med 2006;354: (20):2142-50
7. Lee JK Enns R ,Review of idiopathic pancreatitis .World journal of gastroenterology 2007;13:6296-313
8. Banks PA,Freeman ML .Practice guidelines in acute pancreatitis.Am j Gastroenterol 2006;101:2379-2400
9. Larvin M Mc Mahon Mj .APACHE II score for assessment and monitoring of acte pancreatitis. Lancet 1989;2(8656): 201-5
10. Beckingham IJ ABC of disease of Liver pancreas, and biliary system.Gall stone disease .BMJ 2001;322(7278):91-94