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# **Clinical profile of acute pancreatitis and the application of different severity indices in patients treated at Rehman Medical Institute, Peshawar**

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**Abstract---**Background: Acute Pancreatitis (AP) is the inflammation of the pancreas. Based on the severity of the disease, one can easily manage it, for this purpose certain scoring systems, such as Ranson's Score, Glasgow Score and modified CT Severity Index Score are being used to predict the severity and prognosis of AP. Objectives: The objective of our study is to assess the efficacy of various severity indices (Ranson's score, Glasgow score, Modified CT severity index score) in predicting the prognosis of patients. Methodology: This retrospective study was conducted in the Dept of Medicine at Rehman Medical Institute, Peshawar, between May 2021 to September 2021 after approval from the Department of Research, Rehman Medical College. Data was retrieved from the patients' records on a structured proforma. Those with a definitive diagnosis and were treated for acute pancreatitis in the past 5 years, were included in the study. Results: CT Severity Index Score found that out of 35 males, 10 (28%) had

mild, 16 (45%) had moderate and only 9 (25%) had severe pancreatitis. Whereas out of the 34, only 5 (14%), 17 (50%) and 12 (35%) females had mild, moderate and severe disease respectively. Ranson's Score was employed, AP was graded as mild in 14.7% females and 20% in males. Whereas moderate grading was 74.2% for males and 82.3% for females. A total of 3 (4.3%) patients were graded severe out of which 1 (2.99%) was female and 2 (5.7%) were males. Glasgow Score for our sample showed that 36 patients were scored with 3 or more points and from the rest of 33 patients were scored with less than 3 points indicating mild to moderate AP. Conclusion: According to our study, the scoring system of AP at the time of admission proves beneficial in categorizing the patient on severity basis and providing the care needed immediately.

**Keywords**---acute pancreatitis, systemic inflammatory response syndrome (SIRS).

## **Introduction**

Pancreatitis is inflammation of the pancreas. (1) It occurs when digestive enzymes become activated while still in the pancreas, causing irritation of the pancreatic cells leading to inflammation. The most common causes of acute pancreatitis (AP) include: gallstones and heavy alcohol consumption. AP can also be drug induced. This type of AP resolves once the drug is stopped (2). AP begins with a gradual or sudden onset of pain in the upper abdomen. This might radiate to the back. Most patients require 3 to 5 days of hospitalization for close monitoring, pain management and intravenous hydration. Associated symptoms of AP can include; swollen and tender abdomen, nausea, vomiting, fever and tachycardia (3).

The revised Atlanta classification (RAC) classified "severity" of AP as mild, moderately severe, and severe. Mild acute pancreatitis is the most common form. It has no organ failure, local or systemic complications and usually resolves in the first week. Moderately severe acute pancreatitis is defined by the presence of transient organ failure, local complications or exacerbation of co-morbid disease. While, severe acute pancreatitis (SAP) is constituted by persistent organ failure i.e., organ failure >48 h (4) (5). A study found out that mild acute pancreatitis accounts for 80% of the pancreatitis' cases. It is self-limiting and usually resolves with supportive management in less than a week. SAP accounts for the remainder of cases (6). SAP is characterized by extensive pancreatic inflammation and/or necrosis and is followed by a systemic inflammatory response syndrome (SIRS). This may lead to multiple organ dysfunction syndrome (MODS) within the first week. MODS accounts for 50% of deaths inside the first week of infection. A study in Germany reported that respiratory failure is the most common type of organ failure in acute pancreatitis (7) (8).

Severity of AP is evaluated through SIRS score i.e., Ranson's Score, Glasgow Score and radiological investigations i.e., modified CT Severity Index Score (MCTSI). Ranson's, and Glasgow Scores are more practical in assessing the severity but carry low value in predicting mortality (7). The Glasgow Criteria

predict severity of pancreatitis but at 48 hours after admission. It includes: PaO<sub>2</sub> <59.3 mmHg (7.9 kPa), Age >55 years, WBC >15 x 10<sup>3</sup>/μL (10<sup>9</sup>/L), Calcium <8 mg/dL (2 mmol/L), BUN >44.8 mg/dL (serum urea >16 mmol/L), LDH >600 IU/L, Albumin <3.2 g/dL (32 g/L), Glucose >180 mg/dL (10 mmol/L). Each of the above carries 1 mark. Studies have suggested a binary cutoff at ≥3 as suggesting a significant increase in likelihood of severe pancreatitis (9). Ranson Score is calculated on admission, and at 48 hours, to estimate mortality from pancreatitis. This includes: (a) Criteria at time of patient admission to hospital: Age > 55, Glucose > 200, WBC > 16,000, AST > 250, LDH > 350 (b) Criteria that may develop over the first 2 hospital days: BUN rises more than 5 mg/dL, Base deficit > 4, Hct drops 10% or greater, PO<sub>2</sub> < 60, Calcium < 8, Fluid sequestration > 6L. Each carry one mark. Its results are such; 0-2 points=Mortality is 1%, 3-4 points=Mortality is 16%, 5-6 points=Mortality is 40% and 7-11 points=Mortality almost 100% (9). The objectives of the study is to assess the clinical profile of acute pancreatitis, the efficacy of various severity indices (Ranson's score, Glasgow score, Modified CT severity index score) in predicting the prognosis of patients.

## Methodology

This retrospective study was conducted in the Dept of medicine at Rehman Medical Institute, Peshawar, between May 2021 to September 2021 after approval from the Department of Research, Rehman Medical College. Data was retrieved from the patients' records on a self-structured proforma. Those with a definitive diagnosis and were treated for acute pancreatitis in the past 5 years, were included in the study. Non-probability convenience sampling technique was used. All the patients with chronic pancreatitis and pancreatic malignancy were excluded while those diagnosed with acute pancreatitis were included in the study. Patients were classified into mild, moderate and severe acute pancreatitis based on Ranson's score, Glasgow scoring and Modified CT severity index (CTSI).

## Results

Table.1 shows the distribution of males and females and their ages. A total of 69 samples were studied out of which 35 (50%) were males' and 34 (49%) were females. The mean range for both males and female is between the age group 46-55years. There were 3 (8%) males below the age of 15 years with no females below 15. Most of the males (34%) were between the age group 36-45 years whereas maximum females (35%) were between the age group 56-65 years.

	<15	16-25	26-35	36-45	46-55	56-65	>65	Total
Male	3	0	4	12	4	7	5	35
Female	0	6	6	3	3	12	4	34
Total	3	6	10	15	7	19	9	69

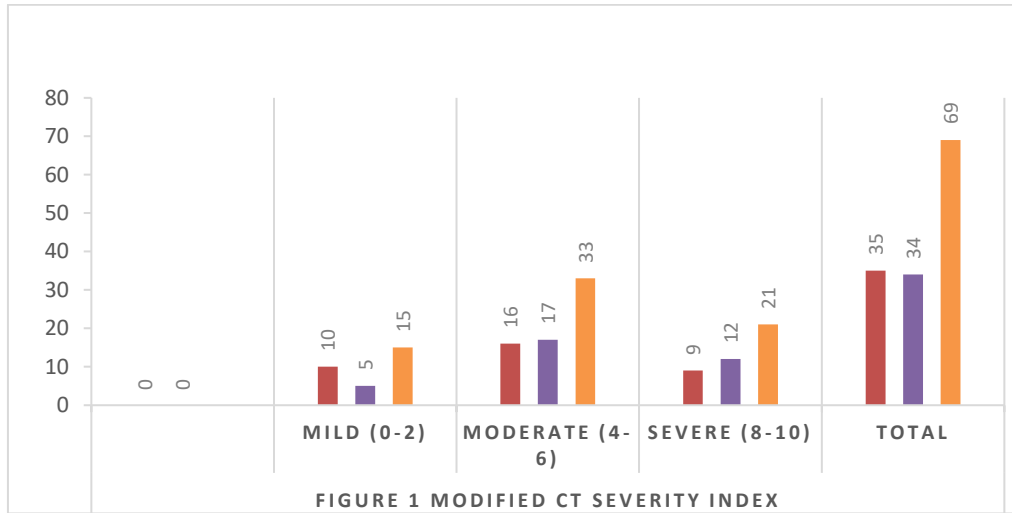
Table 1: Gender and age of the patients

Table 2. Etiological factors in males and females

	Gall Stone	Alcohol	Total
Male	27	8	35
Female	34	0	34

Total	61	8	69
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The two main causes for acute pancreatitis are gall stones and alcohol which are shown in table 2. Out of 69, a total of 61 (88%) cases were due to gallstones and only 8 (11%) due to alcohol. In females there were no Alcohol induced pancreatitis where as in males 8 (22%) were due to alcohol.



The distribution of severity (mild, Moderate and severe AP) according to Modified CT Severity Index Scoring System is shown in Figure. 1. Out of 35 males, 10 (28%) had mild, 16 (45%) had moderate and only 9 (25%) had severe pancreatitis. Whereas out of the 34, only 5 (14%), 17 (50%) and 12 (35%) females had mild, moderate and severe disease respectively.

Ranson's Criteria are primarily used in the inpatient setting. A Ranson score of 0 or 1 predicts that complications will not develop and that mortality will be negligible. A score of 3 or greater predicts severe acute pancreatitis and possible mortality. Severe acute pancreatitis is defined by the presence of any organ failure or local pancreatic complications such as pseudocyst, abscess, or necrosis. In our study, when Ranson's Score was employed, acute pancreatitis was graded as mild in 14.7% females and 20% in males. Whereas moderate grading was 74.2% for males and 82.3% for females. A total of 3 (4.3%) patients were graded severe out of which 1 (2.99%) was female and 2 (5.7%) were males.

Table 3. Ranson's score

		0-2: 1%	3-4: 16%	7-11: 100%	Total
		Mortality	Mortality	Mortality	
	Males	7	26	2	35
	Females	5	28	1	34
Total		12	54	3	69

Table 4. Glasgow score

		≥ 3: severe AP	< 3: Mild to Moderate AP	Total
Gender	Males	17	18	35
	Females	19	15	34
Total		36	33	69

Glasgow pancreatitis score assess the severity of pancreatitis within 48 hours from admission. It is based on patient age and determinations from 7 routine laboratory tests performed within 24 hours from admission for patients who present with acute abdominal pain. Table. 4 shows the Glasgow score for our sample. It was found that 36 patients were scored with 3 or more points and from the rest of 33 patients were scored with less than 3 points indicating mild to moderate AP.

### Discussion

In our study 4.3% patients were below 15 years, 8.7% between 16-25 years of age, 14.5% between 26-35 years of age, 21.7% between 36-45 years of age, 10.1% between 46-55 years of age, 27.5% between 56-65 years of age and 13% above 65 years of age. This corroborates to study by Balthazar et al in which average age was 45 years. (10) In another study on pancreatitis done by Khanna et al, mean age of presentation was 40.5 years. (11) In our study, when Ranson's score was employed, acute pancreatitis was graded as mild in 12 out of 69 (17.4%), 54 (95.7%) as moderate and 3 (100%) as severe. In contrast to a study by Papachristou GI et al, 138 out of 185 (74.6%) patients had mild and 47 out of 185 (25.4%) patients had severe pancreatitis. (12) In another study by Cho J H et al, 140 out of 161(87%) patients had mild and 21 out of 161(13%) patients had severe pancreatitis. (13)

One study shows significant correlation between the severity of pancreatitis and the development of organ failure (9/66 patients) using the modified index (MCTSI) (14). Another study done at tertiary care hospitals in Pakistan, Ranson Score at admission and APACHE were correlated well with outcome of the patients (15). On the basis of severity of pancreatitis on Modified CTSI score patients were categorized into 3 grades-mild, moderate and severe. In our study, maximum number of patients 33 out of 69 (47.8%) had moderate, 21 out of 69(100%) had severe and 15 out of 69 (21.7%) patients had mild pancreatitis. In a study by Mortelet et al 42 out of 66 (63.63%) patients had mild pancreatitis, 19 out of 66 (28.78%) had moderate and 5 out of 66 (7.57%) had severe pancreatitis. (16) The presence of higher number of patients in moderate and severe AP in our study might be attributed to the fact that our hospital is a tertiary care center. Very sick patients having severe AP are referred to us.

The total score ranges from 0 to 8, the higher the score, the greater the AP severity. Scores above 3 also indicate that the patient is likely to require admission to ICU. (17) From our sample, in 72% of cases, severity was assessed accurately by the score. It was found that 36 patients were scored with 3 or more points and from the rest of 69 patients were scored with less than 3 points

indicating mild to moderate AP. Studies done for comparison of various scores have found out that no single scoring index could accurately predict the outcome but they were useful in initial triaging of patients. As our study did have some limitations as it was retrospective in design and majority of the files were missing or missing data from some files. This led to a smaller sample size and therefore our results cannot be generalized for a larger population.

## Conclusion

Within the limits of our study, it can be concluded that the scoring system of acute pancreatitis at the time of admission proves beneficial in categorizing the patient on the basis of severity and providing the necessary management needed immediately. It also helps in identifying those patients that require ICU care.

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