



A DESCRIPTIVE STUDY TO FIND OUT PREVALENCE OF SEVERE ACUTE PANCREATITIS AT TERTIARY CARE CENTRE OF RAJASTHAN.

General Medicine

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ABSTRACT

Background: Acute pancreatitis is a common disease with wide clinical variation and its incidence is increasing. The reasons for grading acute pancreatitis clinically or by using multiple factor scoring systems or single prognostic factor is for the early assessment and accurate prediction of the severity of the disease to avoid costly and invasive monitoring and treatment in the largest group of patients who tend to run a more benign course. In this study, we assess the prevalence of severe acute pancreatitis by using the APACHEII and Ranson's score criteria, in a tertiary care hospital. **Methods:** This prospective study was conducted on 70 patients of acute pancreatitis. Multiple clinical and laboratory variables of both Ranson's and APACHEII scoring system and the final score of the patient from both the scoring systems were assessed to know their efficacy in predicting the severity of the disease (higher the score more severe the disease). In addition the SDMH score was also included in the study to assess severity of acute pancreatitis as well as to compare its validity with APACHEII and Ranson's score criteria. Data were analysed in SPSS v- 24. Independent t-test and Chi-square test were applied, p value <0.05 was considered statistically significant. **Results:** Mortality was found in 4 participants and prevalence of severe acute pancreatitis was found 24.3%, 11.4% according to APACHE II score and Ranson's criteria respectively. A statistically significant difference was found in severe acute pancreatitis score between APACHEII and SDMH score as well as RANSON's and SDMH score and was noted high according to SDMH. **Conclusion:** It is concluded that prevalence of severe acute pancreatitis was found 24.3% according to APACHEII score and 11.4% by Ranson's score. According to SDMH score as score increases, the severity was also increased.

KEYWORDS

Acute pancreatitis, APACHE-II score, Ranson's score, SDMH score etc.

INTRODUCTION

Acute pancreatitis is a common disease with wide clinical variation and its incidence is increasing. The average mortality rate in severe acute pancreatitis approaches 2–10%. Severe acute pancreatitis (SAP) develops in about 25% of patients with acute pancreatitis. Severe acute pancreatitis is a two-phase systemic disease.¹ The first phase is characterized by extensive pancreatic inflammation and/or necrosis and is followed by a systemic inflammatory response syndrome (SIRS) that may lead to multiple organ dysfunction syndromes (MODS) within the first week. About 50% of deaths occur within the first week of the attack, mostly from MODS.² The formation of infected pancreatic necrosis or fluid collection occurs usually in the second week. The factors which cause death in most patients with acute pancreatitis seem to be related specifically to multiple organ dysfunction syndromes and these deaths account for 40–60% of in-hospital deaths in all age groups. The mortality figures associated with MODS vary between 30–100%.³ Infection is not a feature of the early phase. Pro-inflammatory cytokines contribute to respiratory, renal, and hepatic failure. The “second or late phase” which starts 14 days after the onset of the disease, is marked by infection of the gland, necrosis and systemic complications causing a significant increase in mortality.⁴ The association between increasing age and death from acute pancreatitis is well documented. Respiratory failure is the most common type of organ failure in acute pancreatitis.⁵ According to the severity, acute pancreatitis is divided into mild acute pancreatitis (absence of organ failure and local or systemic complications, moderately severe acute pancreatitis (no organ failure or transient organ failure less than 48 hours with or without local complications) and severe acute pancreatitis (persistent organ failure more than 48 hours that may involve one or multiple organs).⁶

The reasons for grading acute pancreatitis clinically or by using multiple factor scoring systems or single prognostic factors is for early assessment and accurate prediction of the severity of the disease to avoid costly and invasive monitoring and treatment in the largest group of patients who tend to run a more benign course.⁷ In this study, we assess the prevalence of severe acute pancreatitis by using the APACHE-II and Ranson's score criteria, in a tertiary care hospital.

METHODS

This prospective study was conducted in Santokba Durlabhji Memorial Hospital cum Medical Research Institute, Jaipur (Rajasthan) from January 2020 to December 2021. This study was designed to assess prevalence of severe acute pancreatitis and compare APACHE-II & RANSON score criteria for severity. 70 patients of

Acute pancreatitis were included in this study. They were selected on the basis of the nonprobability (purposive) sampling method. Multiple clinical and laboratory variables of both Ranson and APACHEII scoring system and the final score of the patient from both the scoring systems were assessed to know their efficacy in predicting the severity of the disease (higher the score more severe the disease).

Tools:

Ranson's Scoring System:

This system is most common method used in assessment of severity of acute pancreatitis. In 1974 Ranson and colleagues identified 11 signs that had prognostic significance during the first 48 hours. The original list was analysed in patients who primarily suffered from alcoholic pancreatitis and was then modified 8 years later for those with gallstone pancreatitis. Higher Ranson's scores predict more severe disease. Also, the higher the Ranson's score the higher the incidence of systemic complications, necrosis, and infected necrosis.

APACHE-II Scoring System:

The abbreviation says Acute Physiology and Chronic Health evaluation. It is a scoring system based on fourteen criteria. Score of more than eight indicates severity. The main disadvantage is not being specific for Pancreatitis but has great advantage in diagnosing severity of the disease. The main advantage of this system over Ranson's scoring system is prediction can be done within 24 hours of admission rather than after 48 hours.

SDMH Criteria:

In addition to APACHEII and Ranson's criteria many studies have shown severity and poor outcome in Acute pancreatitis with individual parameters of SDMH score with variable results.

We thought of these simple biochemical and nutritional tools to assess severity of acute pancreatitis as well as to compare its validity with APACHEII and Ranson's criteria score.

	1	2	3
SODIUM (mEq/L)	>125	120-125	<120
VITAMIN-D (ng/ml)	>30	15-30	<15
ALBUMIN (g/dl)	>3.5	2.5-3.5	<2.5
HAEMATOCRIT (%)	40-45	45-50	>50
Creatinine (mg/dl)	<1.5	1.5-3.0	>3.0

Data were analysed in SPSS v- 24. Independent t-test and Chi-square test were applied. A p value <0.05 was considered statistically significant.

RESULTS

In our study, mean age of the patients was 42.17 years with SD of 11.2. Most of the patients i.e., 35(50%) were belongs to age group 31-40 years and 55(78.6%) participants were male while rest were female. The mean BMI of the study participants was 26.9 kg/m² with SD of 3.8 while most of the patients i.e., 47(67.15) have BMI >25 kg/m². Most common symptoms were nausea and vomiting, which was present in 85.7% patients followed by pain abdomen, present in 75.7% patients. Out of 70 patients, 19 were have DM and 17 patients were have HTN as comorbidity while 18 and 13 patients had history of alcohol drinking and smoking respectively. (Table 1)

Table 1: Patient characteristics of study participants (N=70):

Variables	Frequency	Percent
Age (Mean±SD)	42.17±11.2 years	
Age:		
18-30 years	9	12.9
31-40 years	35	50.0
41-50 years	9	12.9
>50	17	24.3
Gender:		
Female	15	21.4
Male	55	78.6
BMI (kg/m ²):		
<25	23	32.9
≥25	47	67.1
Symptoms:		
Pain abdomen	53	75.7
Nausea	60	85.7
Vomiting	60	85.7
Fever	40	57.1
Others	40	57.1
Comorbidities:		
HTN	17	24.3
CKD	10	14.3
CVD	6	8.6
DM	19	27.1
Habits:		
Smoking	13	18.6
Alcohol	18	25.7
Gallstone	43	61.4

Mortality was found in 4 participants and prevalence of severe acute pancreatitis was found 24.3% ,11.4% according to APACHE II score and Ranson's criteria respectively. (Figure 1)

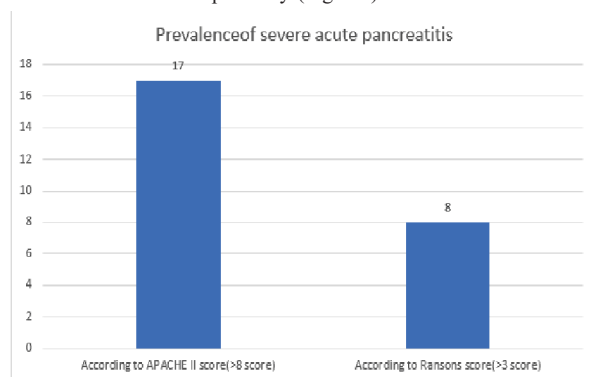


Figure 1: Prevalence of severe acute pancreatitis (N=70):

A statistically significant difference was found in severe acute pancreatitis score between APACHE II and SDMH score as well as RANSON's and SDMH score and was noted high according to SDMH. (Table 2,3)

Table 2: Comparison of SDMH criteria with APACHE II score in acute severe pancreatitis

APACHE II score	Number	Mean	SD	Minimum	Maximum	p-value
Upto 8	53	6.943	1.6102	5.0	11.0	0.0001
>8	17	10.176	2.4808	6.0	14.0	
Total	70	7.729	2.3089	5.0	14.0	

Table 3: Comparison of SDMH criteria with Ranson's score in acute severe pancreatitis

Ransons score	Number	Mean	SD	Minimum	Maximum	p-value
Upto 3	62	7.161	1.7005	5.0	11.0	0.0001
>3	8	12.125	1.5526	10.0	14.0	
Total	70	7.729	2.3089	5.0	14.0	

DISCUSSION

Etiology & Comorbidities:

In the present study, most common symptoms were nausea and vomiting, which was present in 85.7% patients followed by pain abdomen, present in 75.7% patients. Out of 70 patients, 19 were have DM and 17 patients were have HTN as comorbidity while 18 patients and 13 patients had history of alcohol drinking and smoking respectively.

In the study of Subramaniam et al⁸, the causes of acute pancreatitis included biliary stone 14(42.4%), alcoholism 10(30.3%), idiopathic 9(27.2%). 6(18.1%) patients were chronic smokers and 8(24.2%) had at least one co-morbid disease. The common concomitant diseases were hypertension (37.5%), diabetes mellitus (25%), ischemic heart disease (5%).

Study of Kumar et al⁹ showed that the most common etiology of acute pancreatitis was biliary stone (74%) followed by alcoholic (18%). While in the study of Yadav et al¹⁰, alcohol was the most common cause of acute pancreatitis in 40.3%, followed by gall stone in 31.1% of cases.

Comparison of severe acute pancreatitis according to different scoring systems:

In this study, acute pancreatitis patients had mean score of 6.1, 1.7 and 7.7 of APACHE II, Ranson's and SDMH score respectively. According to Ranson's criteria severe acute pancreatitis was found in 11.4% patients. A statistically significant difference was found in severe acute pancreatitis score between APACHE II and SDMH score and was noted high according to SDMH score. Also a statistically significant difference was found in severe acute pancreatitis score between Ranson's and SDMH score and was noted high according to SDMH score.

It was found that in the study of Subramaniam et al⁸, overall, 8 (24.2%) patients suffered from severe pancreatitis and 25(75.7%) had mild acute pancreatitis. All 8 had severe attack as per APACHE II score (>8) and only 3 of these were considered severe by Ranson's score (>3). The systemic complications were a multi organ failure in 2(6.06%), respiratory 1(3.03%) and renal 1(3.03%) all seen in patients with the severe score as per APACHE II.

While in the study of Kumar et al⁹, the AUC for modified CTSI was consistently the highest for predicting severe acute pancreatitis (0.919), pancreatic necrosis (0.993), organ failure (0.893) and ICU admission (0.993). APACHE II was the second most accurate in predicting severe acute pancreatitis (AUC 0.834) and organ failure (0.831). APACHE II had a high sensitivity for predicting pancreatic necrosis (93.33%), organ failure (92.86%) and ICU admission (92.31%), and also had a high negative predictive value for predicting pancreatic necrosis (96.15%), organ failure (96.15%) and ICU admission (95.83%).

In the study of Yadav et al¹⁰, Ranson's score and computed tomography severity index (CTSI) were also established. It was found that out of the 119 cases, 42 (35.2%) developed organ failure and were classified as severe acute pancreatitis (SAP), 47 (39.5%) developed pancreatic necrosis and 12 (10.1%) died. Ranson's score showed a slightly lower accuracy for predicting SAP (AUC 0.956) and mortality (AUC 0.841). CTSI was the most accurate in predicting pancreatic necrosis, with an AUC of 0.958.

Early evaluation of the severity of acute pancreatitis is essential, to allow the clinician to predict the patient's clinical course, estimate prognosis, and determine the need for admission to the intensive care unit. Severe acute pancreatitis can be defined by various systems that predict complications and mortality, there is a difference between a predictive system that suggests complications may develop and the actual development of a complication. Several scoring systems have been developed to assist the clinician in the assessment of the severity

of acute pancreatitis. The most commonly used are the Ranson's score, the modified Glasgow scoring system, APACHE-II and CTSI.¹¹⁻¹²

CONCLUSION

It is concluded that prevalence of severe acute pancreatitis was found 24.3% according to APACHE-II score and 11.4% by Ranson's score. According to SDMH score as score increases, the severity was also increased. Most common etiology was gall stone followed by alcohol. Early detection of acute pancreatitis to prevent severe complications like ARDS, Septic shock, MODS, are of paramount importance.

REFERENCES

1. Go VLW, Everhart JE. Pancreatitis. In: Everhart JE, ed. Digestive Diseases in the United States: Epidemiology and Impact. NIH Publication no. 94-1447. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 1994, p. 693.
2. Corfield AP, Cooper MJ, Williamson RCN. Acute pancreatitis: A lethal disease of increasing significance. *Gut*. 1985; 26: 724.
3. Sinclair MT, McCarthy A, McKay C. The increasing incidence and high early mortality rate from acute pancreatitis in Scotland over the last 10 years. *Gastroenterology* 1997; 112: 482.
4. Lankisch PG, Schirren CA, Kunze E. Undetected fatal acute pancreatitis: Why is the disease so frequently overlooked? *Am J Gastroenterol* 1991; 86: 322.
5. Sandler RS, Everhardt JE, Donowitz M. The burden of selected digestive disease in the United States. *Gastroenterology* 2002; 122: 1500.
6. Russo MW, Wei JT, Thiny MT. Digestive and liver diseases statistics 2004. *Gastroenterology* 2004; 126: 1448.
7. Knaus: APACHE II. A severity of disease classification system. *Crit Care Med* 1985; 13: 818.
8. Subramaniam U, Muthuselvi A, Kesavan. A comparative study between APACHE II and Ranson scoring systems in predicting the severity of acute pancreatitis. *IAIM*, 2019; 6(4): 55-59.
9. Kumar HA, Griwan SM. A comparison of APACHE II, BISAP, Ranson's score and modified CTSI in predicting the severity of acute pancreatitis based on the 2012 revised Atlanta Classification. *Gastroenterol Rep (Oxf)*. 2018 May; 6(2): 127-131.
10. Yadav J, Yadav SK, Kumar S, Baxla RG, Sinha DK, Bodra P et al. Predicting morbidity and mortality in acute pancreatitis in an Indian population: a comparative study of the BISAP score, Ranson's score and CT severity index. *Gastroenterol Rep (Oxf)*. 2016 Aug; 4(3): 216-20.
11. Cho YS, Kim HK, Jang EC. Usefulness of the Bedside Index for severity in acute pancreatitis in the early prediction of severity and mortality in acute pancreatitis. *Pancreas* 2013; 42: 483-7.
12. Papachristou GI, Muddana V, Yadav D, et al. Comparison of BISAP, Ranson's, APACHE-II, and CTSI scores in predicting organ failure, complications, and mortality in acute pancreatitis. *Am J Gastroenterol* 2010; 105: 435-41.