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RESEARCH ARTICLES

COMPARATIVE EVALUATION OF RADIOLOGIC AND CLINICAL SCORING SYSTEMS IN EARLY PREDICTION OF SEVERITY IN ACUTE PANCREATITIS

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ABSTRACT

Background: Acute pancreatitis refers to an acute inflammatory process of the pancreas with a variable clinical course. It is a serious disease with high morbidity and mortality rates. So early identification of clinically severe acute pancreatitis (AP) is critical for the triage and treatment of patients. The aim of this study was to compare the accuracy of various scoring systems for predicting the severity of AP on admission.

Methods: The study was prospectively carried out on 50 patients attending the surgical emergency ward with clinical features of Acute Pancreatitis in our instititution. They were evaluated clinically and subjected to laboratory and radiological investigations as per the designed Performa. Ranson's criteria, Acute Physiology and Chronic Health Evaluation (APACHE)-II, and bedside index for severity in acute pancreatitis (BISAP) scores, and computed tomography severity index (CTSI) of all patients were calculated. The predictive accuracy of each scoring system was measured by the area under the receiver-operating curve (AUC).

Results: From a total of 50 patients included in the study, 32 were diagnosed with mild to moderately severe acute pancreatitis and 18 with severe pancreatitis and two patients with severe pancreatitis died during the hospital stay. The study reveals that when CTSI $\geq$ 3 was selected for prediction of severe AP, sensitivity and specificity were 55.9% and 63.8%, respectively and BISAP score of more than 2 has sensitivity 86% and specificity 69% and the sensitivity and specificity of Ranson's score was 95% and 44.3% respectively. APACHE-II score is the more effective scoring tool than the other scoring systems, although no statistically significant pair-wise differences were observed between APACHE-II and other scoring systems.

Conclusion: The various scoring systems to evaluate the severity of acute pancreatitis included in the study showed similar predictive accuracy. Hence unique models are required to achieve further improvement of prognostic accuracy in acute pancreatitis.

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INTRODUCTION

Pancreatitis is the inflammation of pancreas. Pancreatic damage occurs when the digestive enzymes are activated before they are released into the small intestine and begin attacking the pancreas. There are two types of a pancreatitis and they are acute and chronic pancreatitis. Acute pancreatitis is a sudden inflammation that lasts for a short time. The most common symptoms of acute pancreatitis include:

- Suddenly getting severe pain in the centre of your abdomen.
- feeling or being sick
- Diarrhoea
- Nausea, vomiting and anorexia.

Acute pancreatitis may occur when factors involved in maintaining cellular homeostasis are out of balance. The initiating event may be anything that injures the acinar cell and impairs the secretion of zymogen granules; examples include alcohol use, gallstones, and certain drugs (Joon Hyun, 2015). Acute pancreatitis can cause pseudocysts in the pancreas. These fluid-filled sacks can lead to infections and even internal bleeding. It can also disrupt the balance of the body chemistry. This will lead to more complications. Acute Pancreatitis was diagnosed when two of the three following criteria were met and they are Elevated Amylase/ Lipase defined as three times the upper limits of normal, radiological evidence of pancreatitis and abdominal pain (Bradley, 1992).

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Medical management of mild acute pancreatitis is relatively straightforward. The patient is kept NPO (nil per os—that is, nothing by mouth), and intravenous (IV) fluid hydration is provided. Analgesics are administered for pain relief. Antibiotics, usually drugs of the imipenem class, should be used in any case of pancreatitis complicated by infected pancreatic necrosis. The reason behind the assessment of severity is mainly for practical purpose, where mild pancreatitis responds to supportive treatment very well but severe acute pancreatitis needs some intensive monitoring of numerous parameters, specific therapeutic interventions and it has very good prognosis.

The Atlanta Classification is considered as the global standard tool for the assessment of severity of acute pancreatitis since 1992. However, as time goes on, some of the definitions in the original Atlanta Classification has been proved to be confusing, especially its definition of "severity". In 2012, the Atlanta classification was revised with an emphasis on persistent organ failure. Multi-factorial scoring system includes Ranson's criteria and Acute Physiology and Chronic Health Evaluation (APACHE)-II scores have been used since the 1970s for assessment of the severity of acute pancreatitis (Banks *et al*., 2013).

Balthazar computed tomography severity index (CTSI) was developed in 1990. These predictive methods have been established as an important tool for assessment of the severity of acute pancreatitis. Imrte Glasgow coma scale (GCS), Bank's clinical criteria, Simplified acute physiology score (SAPS) also contribute to evaluate the severity of acute pancreatitis. A new prognostic scoring system, the Bedside Index for Severity in Acute Pancreatitis (BISAP), has recently been proposed as an accurate and simple method for early identification of patients at risk of in-hospital mortality. It includes Blood urea nitrogen (BUN >25 mg/dl), Impaired mental status (GCS<15), age>60 years and Pleural effusion (Thomas, 2016). This study was performed to compare the accuracy of radiological and clinical scoring systems in predicting the severity of acute pancreatitis and to correlate the outcome with the scores observed, in terms of disease severity and mortality.

MATERIALS AND METHODS

Study area: The study was conducted in the Department of Surgery, Rajah Muthiah Medical College Hospital, Annamalai University, Annamalai Nagar, Tamil Nadu, which is a 1260 bedded multi-speciality tertiary care teaching hospital located in rural South India.

Study population: The study includes 50 patients with acute pancreatitis from January to October 2016.

Inclusion Criteria

- Characteristic abdominal pain.
- Serum amylase/lipase (>3 times of its normal value).
- Age between 30 to 70 years

Exclusion criteria

- Pancreatic abscess
- Pancreatic pseudocyst
- Bronchial asthma
- DM and HT
- Renal failures patients

Study design: It was a prospective study on outcomes of patients with acute pancreatitis. Records of the patients selected within the 3 months were assessed and analysed.

***Data Collection*:** Data were collected from the extracted folders of acute pancreatitis patients using a proforma which mainly includes information on laboratory and radiological investigations.

Data Analysis: Data collected were recorded into an Excel proforma, and the severity was assessed using four scoring systems. Patients were classified to have mild or severe acute pancreatitis according to the definitions set by Atlanta Classification guidelines (1992). Survivors were defined as patients discharged alive from the hospital and non – survivors were those who died from pancreatitis or its complications during hospitalization. Patients were observed prospectively until discharge or death.

RESULTS

A total of 50 patients were included in the study and out of this 32 patients had mild to moderately severe AP and 18 patients with severe AP. The most common age group with AP was 61-70 but it had no significant difference between the mild to moderately severe AP group and the severe AP group. The number of male and female patients was higher in severe AP when compared to patients with mild to moderately severe AP **(table: 1)**. The etiological aspect shows that alcohol had significant association with patients with severe AP.

Table 1. Patient characteristics

Age	Mild- Moderately Severe Ap	severe ap
31- 40	6	5
41-50	8	3
51-60	4	2
61-70	14	8
GENDER		
Male	13	22
Female	6	9

The length of hospital stay ranges from 1 day to 30 days. Most of them were discharged within 7 days. (Table: 2)

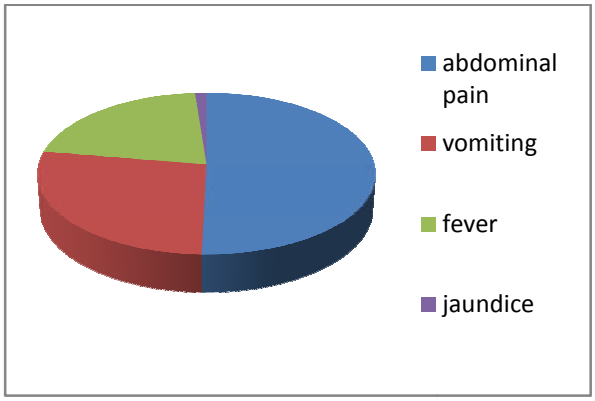
Table 2. Length of hospital stay

	1-7 days	8-14 days	15-21 days	22-28 days	>28 days
No.of patients	24	17	4	3	2
Percentage(%)	48	34	8	6	4

Table 4. Various Scoring systems

Scoring system	Mild to moderately severe ap(n=32)	Severe ap (n=18)
Ranson's criteria	1.7 ± 0.4	2.7± 0.4
BISAP	1.0± 0.8	1.5± 0.2
APACHE-II	5.5 ±2.5	8.8 ± 2.8
CTSI	1.2 ±0.4	2.6 ± 1.4

The most common presentation during the admission was predominantly abdominal pain (100%), vomiting (74%), fever (64%), and jaundice (18%) as per graph 1



Graph 1. Clinical features

The various scoring systems included in the study was Ranson's criteria, Bedside Index for Severity in acute pancreatitis(BISAP), Acute Physiology and Chronic Health Evaluation (APACHE)-II and computed tomography severity index (CTSI).

Ranson's criteria, BISAP, and APACHE-II and CTSI scores were significantly higher in the severe AP group comparing with the mild to moderately severe AP group. (Table: 4)

DISCUSSION

Acute pancreatitis is a disease with variable severity and an evolving process that may involve multiple organ systems. Approximately 80% of patients have mild disease that resolves spontaneously with little morbidity whereas the remaining 20% suffer from severe attack with mortality rates as high as 30% (Manoharan *et al*., 2016). In this study, 18 patients had severe AP while 32 with mild to moderately severe AP. Two patients with severe AP died during hospitalisation. Our studies on the aetiologies of AP, alcohol showed a significant association with patients with severe AP. Severe AP is usually observed during the initial stages of AP and slow progression from mild to severe disease is uncommon. Therefore, early detection of its severity is considered to be the most critical point in the prognosis and management of AP. Many studies have been developed to evaluate the prognostic scoring system in AP to predict those patients who are at highest risk since 1970 (Ranson *et al*., 1974).

Four different scoring systems (Ranson's criteria, BISAP, APACHE-II and CTSI) were compared and analyzed in our study to assess the severity in patients with acute pancreatitis. An attempt also made to compare this study with previous similar studies done by others. The age group included was 30-70 yrs. Patient's less than 30 years were excluded because the normal values of heart rate and respiratory rate are higher at younger age group. So, if they were included, they could have got higher scores incorrectly and could have predicted incorrectly as at risk for developing severe pancreatitis, even with mild disease. Increasing age was found to be correlated well with increasing incidence of mortality, so we don't consider the patients above 70 years of age. A previous study on this topic shows that the degree of correlation between the length of hospital stay and APACHE-II and modified Glasgow scores was larger than that between the length of hospital stay and Ranson's score (Singh *et al*., 2009). But the results of this study demonstrated significant correlation of Ranson, BISAP, and APACHE-II scores, and CTSI with the length of hospital stay. Sensitivity and specificity of Ranson's score was 95% and 44.3% respectively. A study demonstrated that CTSI was found to be useful in identification of patients with severe AP and poor prognosis in selected patients in 1990. This study reveals that when CTSI $\geq$ 3 was selected for prediction of severe AP, sensitivity and specificity were 55.9% and 63.8%, respectively and BISAP score of more than 2 has sensitivity 86% and specificity 69% . The Current practice guidelines suggested that APACHE-II score was the most helpful test at admission in distinguishing severe from mild AP, and, according to recommendation, it should be generated during the first three days of hospitalization. Our study also reveals that APACHE-II score is the more effective scoring tool than the other scoring systems, although no statistically significant pair-wise differences were observed between APACHE-II and other scoring systems.

Conclusion

The study shows that the most common age group of patients affected was in the sixth decade and alcohol was found to be the most common ethiological factor. From the results obtained from this study, it can be concluded that the APACHE-II scoring system seems to have the highest accuracy in assessment of the severity and outcome of AP, although the predictive accuracy of APACHE-II was not significantly different compared to that of the other scoring system.

REFERENCES

Banks PA, Bollen TL, Dervenis C, Gooszen HG, Johnson CD, Sarr MG, Tsiotos GG, Vege SS. 2013. Classification of acute pancreatitis--2012: revision of the Atlanta classification and definitions by international consensus. Gut. 2013;62:102–111.

Bradley EL. 1993. A clinically based classification system for acute pancreatitis. Summary of the International Symposium on Acute Pancreatitis, Atlanta, Ga, September 11 through 13, 1992. Arch Surg. 128:586–590.

Joon Hyun, 2015. Comparison of scoring systems in predicting the severity if acute pancreatitis, world Journal of Gastroentrology, Feb.28,21(8):2387-2394.

Manoharan, G.V., Balamurugan, C., Shanmugam, S. 2016. International Archives of Integrated Medicine, Vol. 3, Issue 7, July.

Ranson JH, Rifkind KM, Roses DF, Fink SD, Eng K, Localio SA. 1974. Objective early identification of severe acute pancreatitis. Am J Gastroenterol.61:443–451.

Singh VK, Wu BU, Bollen TL, Repas K, Maurer R, Johannes RS, Mortele KJ, Conwell DL, Banks PA. 2009. A prospective evaluation of the bedside index for severity in acute pancreatitis score in assessing mortality and intermediate markers of severity in acute pancreatitis. *Am J Gastroenterol.* 104:966–971.

Thomas L. Bollen, 2012. A Comparative Evaluation of Radiologic and Clinical Scoring Systems in the Early Prediction of Severity in Acute Pancreatitis, American Journal Of Gastroentrology 107.4(April2012): 612-619

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