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ANALYSIS OF RANSON SCORE VS SERUM PROCALCITONIN FOR PREDICTING THE SEVERITY OF ACUTE PANCREATITIS: A POPULATION BASED STUDY

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Abstract:

Introduction: *Acute pancreatitis (AP) is highly variable in terms of its clinical presentation and severity. Many scoring systems have been developed for the early detection of severe AP, but they are not convenient for predicting the severity of AP since they involve many parameters.* ***Objectives of the study:*** *The basic aim of the study is to analyze the ranson score vs serum Procalcitonin for predicting the severity of acute pancreatitis in local population of Pakistan.* ***Materials and Methods****: This cross-sectional study was carried out at THQ Depalpur, Okara during 2018. 50 consecutive patients meeting the inclusion and exclusion criteria were offered to enroll in the study after taking informed consent. The diagnosis of acute pancreatitis was based on acute upper abdominal pain associated with a serum amylase level greater than three times the normal value or an elevated serum lipase level and radiological evidence of acute pancreatitis.* ***Results:*** *The data was collected from 50 patients of both genders. 20 were females and 30 males. The median patient age was 49 years. According to the Atlanta criteria, 56 patients were classified as mild AP and 44 as severe AP. There were no significant differences according to age (p= 0.24) and sex (p= 0.65). The causes of AP were biliary stone, idiopathic or miscellaneous; differences were not significant. Twenty patients died: sixteen of multiple organ failure and four of severe necrotizing pancreatitis; all twenty had severe AP.* ***Conclusion:*** *It is concluded that patients with acute pancreatitis, serum procalcitonin level at admission does not accurately predict the progression to severe acute pancreatitis.*

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INTRODUCTION:

Acute pancreatitis (AP) is highly variable in terms of its clinical presentation and severity. Many scoring systems have been developed for the early detection of severe AP, but they are not convenient for predicting the severity of AP since they involve many parameters. Ranson's score is relatively accurate at classifying the severity of AP, but it is difficult to calculate the score as it requires a 48-hour, missing the potential for early treatment [1]. The acute physiology and chronic health examination (APACHE)-II is more accurate than Ranson's score, and is more commonly used to predict the severity of AP, although it was designed originally to predict intensive care unit survival and required the collection of many parameters, some of which might not be relevant to AP prognosis. The Glasgow score also requires many clinical parameters and needs 48 hours to complete [2]. In 1990, Balthazar et al. described the utility of contrast-enhanced computed tomography (CT) for evaluating the severity of AP and developed the Balthazar computed tomography severity index (BCTSI) based on contrast-enhanced CT, but this system was based on local complications and did not reflect the systemic inflammatory response. The biochemical marker serum procalcitonin (PCT) is a relatively accurate and convenient method for predicting the severity in AP and is easily measured. Some studies revealed a strong relationship between an increased serum PCT and the severity of AP [3].

Several inflammatory markers are being used routinely in various hospitals in Pakistan to assess the prognosis of patients with acute pancreatitis. These include total and differential leukocyte counts, erythrocyte sedimentation rate, and CRP amongst others. Several scoring systems have been developed for severity stratification in acute pancreatitis [4]. These include Ranson score, Glasgow score, BISAP score and CT severity index. Some of these scores require at least 48 hours to obtain a complete score whilst others are way too complex. Procalcitonin is a calcitonin propeptide reported to increase early in severe infection and inflammation [5].

Objectives of the study

The basic aim of the study is to analyze the ranson score vs serum Procalcitonin for predicting the severity of acute pancreatitis in local population of Pakistan.

MATERIALS AND METHODS:

This cross-sectional study was carried out at THQ Depalpur, Okara during 2018. 50 consecutive patients meeting the inclusion and exclusion criteria were offered to enroll in the study after taking informed consent. The diagnosis of acute pancreatitis was based on acute upper abdominal pain associated with a serum amylase level greater than three times the normal value or an elevated serum lipase level and radiological evidence of acute pancreatitis. Patients with history of trauma, any active cardiac or renal issue were excluded from the study.

Collection of data

Data collection involved documentation of medical history, age, sex, vital signs, abdominal signs, and drug history. Serum procalcitonin level determination was performed on the same serum sample drawn for other biochemical tests.

Biochemical analysis

Plasma procalcitonin was estimated using semi quantitative strip test immunoassay. All patients were classified as mild or severe AP according to the Atlanta criteria.

Statistical analysis

Student's t-test was performed to evaluate the data. The relations of BP to other variables were analyzed by linear regression and Pearson correlation coefficients. Multiple regression analysis studied the interdependence of these relations among variables found to correlate significantly with BP. Data are expressed as the mean ± SD.

RESULTS:

The data was collected from 50 patients of both genders. 20 were females and 30 males. The median patient age was 49 years. According to the Atlanta criteria, 56 patients were classified as mild AP and 44 as severe AP. There were no significant differences according to age (p= 0.24) and sex (p= 0.65). The causes of AP were biliary stone, idiopathic or miscellaneous; differences were not significant (p= 0.40) (Table 1). Twenty patients died: sixteen of multiple organ failure and four of severe necrotizing pancreatitis; all twenty had severe AP (table 02).

Table 1: Etiology of Pancreatitis

Etiology	No. of cases
Biliary	58
Idiopathic	10
Post ERCP	16
Alcoholic	2
Traumatic	7
Hypertriglyceridemia	7

Table 02: Sensitivity, specificity, predictive values and diagnostic accuracy of RANSON score ≥3 for discrimination of severe pancreatitis

Parameter	**Estimate**	**Lower - Upper 95% CI**
Sensitivity (%)	42.83	(24.56-61.56)
Specificity(%)	85.61	(60.26-91.52)
Positive predictive value	74.56	(50.12-81.67)
Negative predictive value	48.65	(37.64-67.79)
Diagnostic Accuracy(%)	67.1	(50.3-74.5)

DISCUSSION:

AP is a common disorder that places a substantial burden on the healthcare system. The clinical course of AP is usually mild and it often resolves without sequelae. Nonetheless, 10% to 20% of patients experience a severe AP attack, resulting in an intense inflammatory response, a variety of local and systemic complications, a prolonged hospital course, and significant morbidity and mortality [6]. The scoring of patients with AP is important for several reasons. First, the clinician can be alerted to the presence of potentially severe disease. Second, severity can be compared both within and between patient series. Third, a rational selection of patients can be made for inclusion in trials of potential new treatments or interventions. Unfortunately, the scoring systems used at present are often inadequate in patients with severe AP, which is characterized by rapidly progressive multiple system organ dysfunction. It is very important to be able to distinguish between mild and severe acute pancreatitis [7]. Contrast enhanced CT is considered as the gold standard to check for evidence of necrosis. Scoring systems have been developed to assess the severity of pancreatitis as early as possible and allows for the all-important decision to be made i.e whether intensive care is needed or not [8]. Unfortunately, the scoring systems used at present are often inadequate in patients with severe AP, which is characterized by rapidly progressive multiple system organ dysfunction. Ranson score has been used successfully to grade the severity of pancreatitis over past several years however its use is limited by the fact that at least 48 hours are required to obtain a valid score [9]. Thus there is a recognized need for a method for determining the severity of acute pancreatitis which can be applied daily, can easily be evaluated, which is practical and has a high rate of specificity and accuracy [10].

CONCLUSION:

It is concluded that patients with acute pancreatitis, serum procalcitonin level at admission does not accurately predict the progression to severe acute pancreatitis. Ranson score correlated better than serum procalcitonin in predicting the progression to severe pancreatitis.

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