Evaluation of Platelet Count as a Predictor of Severe Pancreatitis

Rajesh Chopra[1], Arun Chauhan[2], Charu Smita Thakur[3], Archana Dogra[4], Shruti Thakur[5]

ABSTRACT

Introduction: Acute pancreatitis is a life threatening inflammatory disease with high morbidity and mortality. Multiple markers are used to predict severity of pancreatitis. An effective marker would help greatly in early diagnosis of disease severity and thus help in timely treatment.The present study attempted to evaluate blood platelet levels as a marker for assessing the severity of acute pancreatitis.

Material and methods:37 patients with acute pancreatitis admitted in Department of Surgery IGMC Shimla were included in the study after taking informed consent. Patients were evaluated and diagnosed with acute pancreatits using blood investigation (serum amylase) as well as imaging modalilities(ultrasound and contrast enhanced CT scan). Patients blood platelets level were compared on day 1 and day 5 of admission in mild and severe pancreatitis patients.Results were then analysed statistically.

Results: On statistical analysis a platelet count of ≤ 150 m/mm3 was found to be statistically significant on both day 1 (p=0.008)) and day 5 (p=0.001) of admission between patients with mild and severe pancreatitis.

Conclusion: Platelets level can function as a cost effective good prognostic marker for assessing severity of pancreatitis.

Keywords: Pancreatitis, Platelet Count, CT Scan.

INTRODUCTION

Acute pancreatitis is characterized by acute onset of abdominal pain often radiating to back and occasionally associated with nausea and vomiting. It is associated with raised serum amylase, lipase levels, and suggestive radiological features on USG and CT-scan. This disease complex is known to have a multi-factorial etiology with gall stones and alcohol consumption accounting for 80-90% of the cases, 10-20% attributed to idiopathic disease or a variety of miscellaneous causes including trauma, surgery, drugs, hereditary, infection and toxins.[1]

Pancreatitis may manifest itself either as a mild or a severe disease (Atlanta Classification of Acute Pancreatitis, 1992).[2,3] Both anatomic and physiologic criteria are used to stratify the disease into mild and severe form. Anatomic methods of stratification are based on contrast-enhanced computed tomography imaging indices like CT Severity Index and Modified CT Severity Index.

The severity physiologic criteria used include:

- Presence of local complications such as necrosis, abscess, or pseudocyst.
- Failure of one or more systems causing shock, respiratory or renal failure, gastrointestinal bleeding, thrombocytopenia and hypokalemia.
- APACHE II and Ranson scores.

Inflammatory markers assay

The majority of acute pancreatitis cases are of mild manifestation, and they generally resolve spontaneously within a few days. The severe form of the disease is present in up to 25% of cases, and has a mortality rate of 10-20%.[4 5] Many single laboratory parameters have been studied for predicting the severity of acute pancreatitis like ESR, LDH, IL-8, TNF-α, PMN - elastase, α2-macroglobulin and urinary trypsinogen. An ideal parameter should be readily available, cheap, impersonal, have a high sensitivity and positive prognostic value to diagnose severe pancreatitis early.

The present study attempted to evaluate platelet levels as a predictive marker for severity of pancreatitis.

MATERIAL AND METHODS

The present study was carried out in the Department of Surgery, Indira Gandhi Medical College and Hospital, Shimla, Himachal Pradesh on patients admitted with the diagnosis of acute pancreatitis. The study was conducted over a period of one year from July, 2011 to June, 2012. Thirty seven patients admitted with diagnosis of acute pancreatitis were considered for this study, after taking informed consent and necessary clearance from ethical committee.

Inclusion criteria

- All patients admitted with diagnosis of acute pancreatitis irrespective of the etiology.

Exclusion criteria

- Pregnant females who could not be subjected to radiation for CT scan to assess for pancreatic necrosis.
- Patients with deranged renal function test who could not undergo contrast CT study.
- Patients with previous episode of proven pancreatitis.

Acute pancreatitis was diagnosed according to the clinical symptoms, radiological evidence (USG and CT scan) and elevation of serum α-amylase more than three times. Onset of pancreatitis was taken as the time when patient developed symptoms rather than the time when he was admitted.

A detailed history was taken as well as physical examination was performed in all patients. Routine blood investigations

[1]Surgery, IGMC, Shimla, [2]Assistant Professor, Department of Surgery IGMC, Shimla, [3]Registrar, Department of Radiodiagnosis, IGMC, Shimla, 4Assistant Professor, Department of. Physiology, [5]Department of Radiodiagnosis, IGMC, Shimla, India

Corresponding author: Dr Arun Chauhan, Assistant Professor, Department of Surgery, IGMC, Shimla.

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Platelet count (m/mm³)	Day 1		Day 5	
	Mild (n=25)	Severe (n=12)	Mild (n=25)	Severe (n=12)
≤150	2	7	0	7
150-400	18	5	14	3
≥400	5	0	11	2
Mean±S.D	287.12±24.06	171.58±31.50	351.96±91.20	211.67±133.22
p value	0.008 (significant)		0.001 (significant)	

Table-1: Platelet count

were performed on day 1 as well as day 5 post admission which was followed by imaging by ultrasound abdomen and contrast enhanced CT scan of the abdomen to establish the diagnosis of acute pancreatitis.

STATISTICAL ANALYSIS

All the investigations were duly noted on proformas. Data obtained was then evaluated statistically using SPSS software with Fischer exact test analysis performed on relevant data. A p value<0.05 was taken as significant.

RESULT

The age of the patients ranged between 24 to 82 years with a median age of 45.00±14.22 years. There were 12 male and 25 female patients with the Female: Male ratio being 2.1: 1. Patients were diagnosed on basis of clinical, biochemical(amylase more than 3 times normal) as well as radiological findings(Ultrasound and CECT abdomen).

Gallstones accounted for 75.68% of all the cases followed by alcohol (16.22%). In 3 (8.10%) patients the exact cause could not be ascertained. Pain was the most common symptom while localized abdominal tenderness was the most common sign present in all patients.

On the basis of CT patients were diagnosed to have mild pancreatitis in 25 patients and severe pancreatitis in 12 patients.

Platelets count was recorded on first and fifth day in all patients of acute pancreatitis (TABLE 1).

On the first day the platelet counts in mild pancreatitis cases ranged between 87 – 545 m/mm³ and in the severe pancreatitis cases ranged between 50 – 345 m/mm³. On the fifth day the platelet counts in mild pancreatitis cases ranged between 199 – 510 m/mm³ and in the severe pancreatitis cases ranged between 75 – 456 m/mm³.

On Fischer exact test analysis a platelet count of ≤ 150 m/mm3 was statistically significant on both day 1 (p=0.008)) and day 5 (p=0.001) On both these days the platelet counts differed significantly between mild and severe groups.

DISCUSSION

Acute pancreatitis is a common emergency presentation, being responsible for 3% of all hospital admissions with acute abdominal pain. The average mortality rate in acute pancreatitis approaches 2-10%. This disease spectrum may manifest locally as interstitial edema in mild disease to pancreatic necrosis and systemic features of organ failure on the other extreme of severe pancreatitis.[6,7]

It becomes essential to know if the patient has severe pancreatitis at an early stage, since it influences the outcome by permitting an early aggressive therapy and antibiotic prophylaxis in selective patients. The quest in search for early parameters has led to creation of many scoring systems which are cumbersome and time consuming. To allay the delay many single parameters have been studied including markers of inflammation like CRP, cytokines, proelastases. There is a constant search for a highly sensitive, readily available, cost effective predictor of severity of the disease which could perhaps lead to early diagnosis and possibly better outcomes. Platelets are directly involved in the systemic inflammatory process of acute pancreatitis, which leads to their consumption

and possibly lower counts in severe disease in comparison to mild pancreatitis. A simple blood platelet count might therefore serve as a good prognostic marker.

The Atlanta symposium considers a platelet count of less than 100m/mm3 to be a part of organ failure that accompanies severe pancreatitis. Sequential Organ Failure Assessment (SOFA)[8] score for severity of pancreatitis considers the cardiovascular status, respiratory status, creatinine, GCS, platelet and bilirubin in calculating severity.

The Japanese consensus[9] for severity assessment of acute pancreatitis imparts 2 points for a platelet count < 100 m/mm³. However another study of Supot Pongprasobchai et al[10] did not find any significant correlation between presence of pancreatic necrosis and platelet counts. Despite conflicting data in previous studies the present study found decreased platelet levels (<150 m/mm³) to be significantly associated with the presence of severe pancreatitis both on first and fifth days. In the study there incurred 3 deaths and all of them died after the second week of onset. All three patients had severe pancreatitis. Overall the mortality rate in this study was 8.1% and in the severe pancreatitis group 25%.

CONCLUSION

In the present study blood platelets level were found to be a significant predictor of severity of acute pancreatitis. Platelet count might therefore prove to be a cost effective, sensitive prognostic marker of severity of acute pancreatitis and might help in early diagnosis and imparting appropriate therapy for this life-threatening disease.

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