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THE CORRELATION BETWEEN BIOCHEMICAL MARKER AND RADIOLOGICAL SEVERITY SCALE IN ACUTE PANCREATITIS.

Dr Asutosh Dave	MD Radiodiagnosis, Professor and Head, Department of Radiodiagnosis, GCS Medical College, Ahmedabad, Gujarat.
Dr Nishant Patel*	2nd Year Resident, MD Radiodiagnosis, Department of Radiodiagnosis, GCS Medical College, Ahmedabad, Gujarat. *Corresponding Author
Dr Sarita Mirchandani	2nd year resident, MD Radiodiagnosis, Dept. Of Radiodiagnosis, GCS Medical College.
Dr Mayankkumar Patel	2nd year resident, MD Radiodiagnosis, Dept. Of Radiodiagnosis, GCS Medical College.
Dr Jaideep Jagani	2nd Year resident, MD Radiodiagnosis, Dept. Of Radiodiagnosis, GCS Medical College.

ABSTRACT **Purpose:** To correlate modified CT severity index with serum lipase levels in cases of acute pancreatitis **Introduction:** Acute pancreatitis is an inflammatory condition of the pancreas characterized clinically by abdominal pain and elevated levels of certain biochemical markers in the blood.

Patients and method: Patients with positive findings of acute pancreatitis on CT scan were included in the study. Other diseases of pancreas were excluded. Modified CT severity index and serum lipase levels were recorded for all these patients. Total 20 patients were selected among which 16 were male and 4 were female. The Pearson's correlation coefficient between modified CT severity score and serum lipase levels were calculated .

Result : The Pearson's correlation coefficient between modified CT severity score and serum lipase levels found positive with r value 0.772 and was statistically significant with p value < 0.05.

Conclusion: The radiological finding along with biochemical markers may help in diagnosing as well as finding the severity of acute pancreatitis and thus help in early treatment aspects.

KEYWORDS : acute pancreatitis, lipase, modified CT severity index, necrotisingg pancreatitis, organ failure

INTRODUCTION

Acute pancreatitis is a complex disease with a variable clinical course. Patients with acute pancreatits may present with mildself-limiting disease without complications , where as approximately 15–20% of patients develop severe acute pancreatitis with local/systemic complications; and mortality in this group may reach 20–30%. It mainly presents with abdominal pain. Etiology of acute pancreatitis includes alcohole abuse, biliary stone, endoscopy, trauma, metabolic disorders, etc. The spectrum of severity of the illness ranges from mild self-limiting disease (Acute oedematous or interstitial pancreatitis) to a highly fatal severe acute necrotizing pancreatitis.

The diagnosis of acute pancreatitis is usually based on a combination of clinical findings, laboratory investigations, and imaging techniques Various clinical and radiological methods to measure severity of acute pancreatitis are Ranson's criteria, the acute physiology and chronic health evaluation (APACHE II) scoring system, the CT severity index , modified CT severity index etc.We will focus mainly on CT severity index and modified CT severity index [1,2].

The CT severity index (developed by Balthazar and colleagues) focuses on degree of pancreatic inflammation and necrosis on 10 point severity scale .This CT severity index was very helpful to predict morbidity and mortality in acute pancreatitis cases. But this index failed to correlate subsequent development of organ failure, extrapancreatic parenchymal complications or peripancreatic vascular complications. Thus Later on modified CT severity index was developed to predict better clinical outcome[2].

The pancreatic enzymes derived from pancreatic acinar cells [amylase, lipase, and the proenzyme trypsinogen] are the cornerstone in the laboratory diagnosis of AP. Serum lipase is a more sensitive and specific biochemical marker of AP than the more frequently used amylase[4]. Moreover, serum amylase level offers no additional advantage if simultaneously measured with serum lipase. The serum amylase levels usually rises more than three folds the normal upper limit. The rise in levels are usually in first 12 hrs which comes down to the normal in 3-5 days. The serum lipase levels in comparison to the serum amylase levels remains increased for 8-14 days after onset. [3]

This study was done to correlate modified CT severity index with serum lipase levels in cases of acute pancreatitis.

- **Modified CT severity index**

Pancreatic inflammation:	
Normal pancreas	0
Intrinsic pancreatic abnormalities with peripancreatic fat inflammation	2
Pancreatic or peripancreatic fluid collections or peripancreatic fat necrosis	4
Pancreatic necrosis:	
None	0
≤30%	2
>30%	4
Extrapancreatic complication (one or more of pleural effusion, ascitis, vascular complications, parenchymal complications or gastrointestinal track involvement)	2

PATIENTS AND METHOD

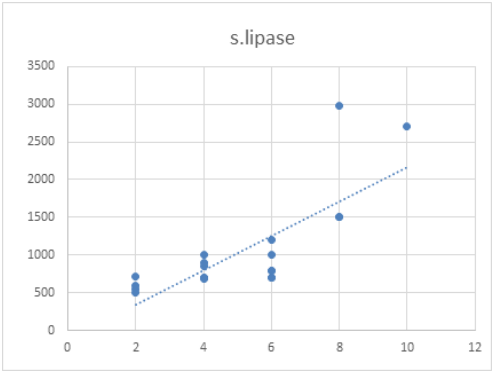
This retrospective study which was approved by institutional ethics committee, conducted at GSC Medical College and Hospital from November 2017 to April 2018. Patients with acute pancreatitis showing positive findings on CT scan were included in the study. Any other disease of pancreas was excluded.

All the patients were monitored with serum lipase levels and Modified CT severity index were recorded. The correlation between two was done statistically by Pearson's correlation coefficient.

Siemen's autoanalyzer was used for analyzing serum lipase by enzymatic kinetic assay method . The CT scan was done on a Siemen's 16 slice MDCT scanner .

RESULT

This study included total 20 patients (16 were male and 4 were female). The serum lipase and modified CT score was recorded for all this patients. The Pearson's correlation coefficient between modified CT severity score and serum lipase levels was done and found positive with r value 0.772(Graph -1). This correlation is statistically significant with p value < 0.05.



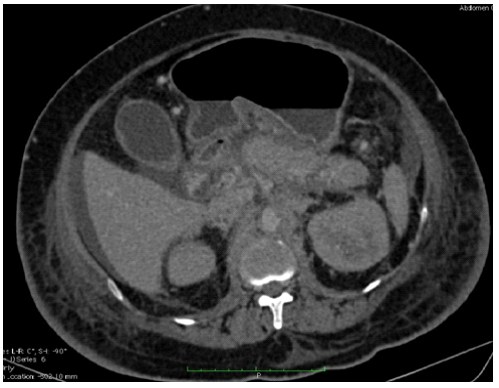


Figure :CECT abdomen showing bulky and homogenously enhancing pancreas with peripancreatic fluid collection and fat stranding with mild perihepatic fluid collection.No e.o any nonenhancing necrotic component.Modified CT severity index score - 6.

DISCUSSION

CT severity assessment using MCTSI showed significant correlation with outcome parameters like mean duration of hospital stay, presence of persistent organ failure and mortality. The modified CT scoring system has been found better than simple CT scoring system as that can assess severity and organ failure. This can provide better view in respect to complications, hospital stay and patient outcome as found in studies by Koenraad J et al4 and Adhishwari PP et al 5. In the current study serum lipase and modified CT score parameters were correlated statistically and found positive significantly. This has the r value of 0.772 with p value less than 0.05. The serum lipase along with modified CT scoring system may be helpful for grading the severity of acute pancreatitis and outcome.

CONCLUSION

Despite the fact that the CT severity index has been successfully used to predict overall morbidity and mortality in patients with acute pancreatitis, recent literature has revealed the limitations of this currently accepted CT severity index . First, the presence of organ failure], extrapancreatic parenchymal complications, and peripancreatic vascular complications does not significantly correlate with the score obtained with this index. Second, as reported in two independent studies, the interobserver agreement for scoring CT scans using the current CT severity index is only moderate, with a reported percentage of agreement approximating 75%. Finally, as acknowledged by Balthazar et al.and confirmed by others, no significant difference in morbidity and mortality is seen, when using the CT severity index, between patients who have 30-50% necrosis and patients who have more than 50% necrosis. Therefore, it is questionable whether these specific categorizations of the degree of pancreatic necrosis are necessary.The modified CT severity index differentiates only between presence or absence of acute fluid collections and, therefore, does not require a count of the collections. Furthermore, on the modified index, the presence of pancreatic necrosis is only scored as "no necrosis," "minimal necrosis," or "substantial necrosis," thereby eliminating the unnecessary categorization between patients who have 30-50% necrosis and patients that have more than 50% necrosis. In addition, with moderate weighting (2 points or 20%), the presence of extrapancreatic findings, such as pleural fluid, ascites, extrapancreatic parenchymal abnormalities, vascular complications, or involvement of the gastrointestinal tract, can be incorporated into the analysis.

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