



A Case of Acute Pancreatitis without Enzyme Elevation – A Rare Presentation of a Common Condition

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Abstract

A cute Pancreatitis is most often diagnosed based on a threefold elevation of amylase and lipase in the appropriate clinical setting. Very rarely the enzyme levels may be completely normal casting a doubt on the diagnosis. We present a case of acute pancreatitis without elevation of enzymes, review the literature, enlist the situations where serum enzyme levels are not elevated, discuss the diagnostic criteria, enzyme kinetics and briefly delve into the newer biomarkers of acute pancreatitis.

Keywords

A cute pancreatitis, Amylase, Lipase, Computed tomographic scan, Abdominal pain

abdominal pain of 2 days duration. The pain was constant, sharp, radiated to the back and was aggravated on movement and relieved by rest. Patient also had 3 to 4 episodes of loose non bloody watery bowel movements over a period of 48 hours. The past medical history was significant for obesity, BMI > 35 KG/M, fatty liver, chronic back pain, hypertension, dyslipidemia, a history of smoking, alcohol abuse and drug use. He was on benazepril, metoprolol, fenofibric acid, hydrochlorothiazide, and oxycodone at the time of presentation.

Examination revealed a middle aged obese man in distress, the blood pressure was on the lower side measuring 93/50 mmHg and tenderness was elicited on palpation of the right upper quadrant, the bowel sounds were diminished.

Laboratory examination revealed acute kidney injury with a blood urea nitrogen 32 mg/dl, creatinine 1.68 mg/dl, calcium 8.3

Introduction

The diagnosis of pancreatitis requires at least two of the following three criteria including a characteristic abdominal pain, enzyme elevation three times normal and findings on imaging studies. There are several reports in the literature of pancreatitis without elevation of amylase. However it is extremely rare not to have elevations of serum lipase. When faced with a patient with characteristic abdominal pain and normal enzyme levels very few clinicians are comfortable pursuing a diagnosis with imaging studies particularly in the presence of relative contraindication to administering contrast agents such as acute kidney injury which frequently accompanies this condition. Patients could be misdiagnosed as drug seeking or the symptoms could be labeled as a functional disorder leading to catastrophic outcomes.

On the other hand administering contrast agents and imaging everyone with abdominal pain to rule out a rare possibility of pancreatitis in the absence of enzyme elevation or to admit them for observation is not only inappropriate but also costly. There is a need for newer and better markers that not only help in the diagnosis but also provide useful prognostic information.

Case Presentation

A 44 year old Caucasian male presented with left upper quadrant



Figure 1: Cross sectional computed tomographic image of the pancreas demonstrating peripancreatic stranding suggestive of acute pancreatitis.

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meq/dl, albumin 3.4g/dl, amylase 68 U/L, lipase 25 U/L and the white cell count was elevated at 18100. A computed tomographic scan of the abdomen revealed inflammatory stranding around the tail of pancreas (Figure 1).

The patient was admitted to the hospital with a differential diagnosis of pancreatitis versus penetrating gastric ulcer eroding into the tail of pancreas. An upper gastrointestinal endoscopy was normal. The patient was managed conservatively and he quickly improved and was discharged after 5 days. The serum enzyme levels continued to be normal throughout the hospital course.

Discussion

In the appropriate clinical setting the diagnosis of pancreatitis is usually made on the basis of elevated amylase and lipase levels with or without imaging studies. After the onset of acute pancreatitis serum amylase increases over 3 to 6 hours with a half-life of 10 to 12 hours. It remains elevated for 3 to 5 days and is excreted by the kidneys. Serum lipase levels increases over 3 to 6 hours and peaks is 24 hours ($t_{1/2}$ 6-13 hrs). Unlike amylase serum lipase is reabsorbed by the kidney and hence remains elevated for 1 to 2 weeks [1].

There are several case reports of pancreatitis with normal amylase levels. According to some authors 19-32% of patients presenting with acute pancreatitis have a normal amylase level [2,3]. The sensitivity of amylase is 79% with a range of 68 to 99.5%, the specificity is between 71 to 98%. The sensitivity of lipase is 96.5% with a range of 80 to 100% [3].

Role of serum amylase and lipase in the diagnosis of acute pancreatitis

Serum amylase and lipase can be normal in children with acute pancreatitis. Normal lipase in acute pancreatitis has also been reported in children with acute pancreatitis. Coffey et al studied pancreatitis in

125 patients and determined that the diagnostic yields, in descending order, were 93% for serum lipase, 67% for CT, 54% for serum amylase and 27% for ultrasound respectively. They concluded that the best way to diagnose the condition was to use a combination of tests [4].

A normal serum amylase and lipase does not exclude pancreatitis, at the same time, it is important to remember that these enzymes can be elevated in a number of other conditions mentioned in table 1.

Given the above limitations of serum amylase and lipase a number of other markers of the disease, each with its own advantages and limitations have been studied and are listed in table 2.

Conclusion

Pancreatitis is a common clinical problem and the usual enzymatic markers of pancreatitis can be falsely normal, furthermore their levels do not reflect the severity of the disease and the clinician is left with cumbersome tools such as acute physiologic and chronic health evaluation (APACHE) or ransons criteria. The newer enzymatic markers have the advantage of being sensitive and specific as well as being useful in gauging the severity of the condition. It is likely that these markers will be validated in clinical studies and will be increasingly used to diagnose acute pancreatitis and predict the risk of complications.

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Table 1: Differential diagnosis of elevated amylase lipase

Causes of elevated serum lipase [5]	Causes of elevated serum amylase [6]
Renal failure	Salivary disease
Acute cholecystitis	Renal failure
Diabetic ketoacidosis	Macroamylesemia
Duodenal ulceration	Intestinal disease
Pancreatic calculus	Female reproductive tract disease
Pancreatic tumors	
HIV disease	
Macrolipaseemia	
Post-ERCP/trauma	
Celiac disease	

Table 2: Newer Enzymatic Markers of Pancreatitis

Marker	Sensitivity %	Specificity%	Significance	Number of subjects in the studies
Pancreatitis associated protein (PAP) [7]	100	94	Useful in diagnosis, but may not be a good marker for establishing severity.	70
Phospholipase A2 levels [8]	75	78	Role in pulmonary dysfunction can differentiate mild from severe pancreatitis as early as day 1. The diagnostic accuracy is low when compared to other biomarkers [9].	85
Trypsinogen activated peptide [10-12]	58 (severity)	73 (severity)	Serum levels are the best and earliest marker of acute pancreatitis. Urine TAP levels are more sensitive than amylase and lipase [13]. Can differentiate mild from severe forms and urinary detection adds to ease of establishing a diagnosis.	55-246 patients
Serine Protease inhibitor Kazal Type 1 and Human pancreatic secretory trypsin inhibitor [14]	71 (in predicting severity)	77 (in predicting severity)	Not widely available, more sensitive than CRP in predicting severity of acute pancreatitis.	26
Trypsinogen-2 and Trypsin-2-alpha 1 antitrypsin complex [15-17]	91(severity)	71 (severity)	Useful in assessing the severity of pancreatitis. The sensitivity and specificity are similar to amylase and lipase [18]. Trypsinogen 2 is useful in diagnosing CRP associated pancreatitis.	31 to 100 patients
Procarboxypeptidase B and carboxypeptidase B activation peptide (CAPAP) [19,20]			Procarboxypeptidase is similar in sensitivity to amylase and lipase. Persists for longer so useful in late stages. At day 3 it is useful in differentiating mild from severe forms. Carboxypeptidase B, can be detected in urine and a good marker of severity.	

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