

Normal lipase acute pancreatitis: A case report and brief review of literature

Om P. Sanjeev, Ratender Kumar Singh, Tanmoy Ghatak

Emergency Medicine Department, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India

Abstract

Acute pancreatitis is a common presentation in Emergency Department. Elevated amylase and lipase levels are one of three important criteria to diagnose acute pancreatitis. Out of amylase and lipase, the latter is considered more specific for acute pancreatitis. We report a case of acute pancreatitis where serum lipase levels remained always within normal limits. On review of published literature on acute pancreatitis with normal lipase levels, 23 such case reports were retrieved. A brief review, of all these cases

including the case presented here, had unknown etiology in 50% of cases followed by alcohol and gallstone. Pain abdomen was the commonest presentation followed by vomiting. Normal discharge could be done in 71% of cases and 17% of patients were non-survivors. Hence, normal lipase cannot rule out acute pancreatitis on its own. A typical presentation of acute pancreatitis needs radiological workup like an Ultrasound abdomen or CT scan with IV contrast (if not contraindicated) before refuting its possibility.

Introduction

Acute Pancreatitis (AP) is a common presentation in Emergency Departments (ED) and accounts for approximately 300,000 visits each year in EDs of the United States alone.¹ Acute Pancreatitis is a complex clinical syndrome with variable outcomes ranging from self-resolving disease to multi-organ dysfunction syndrome and death. Hence, early diagnosis may play a crucial role to direct appropriate therapy within the time that influences the outcome.

In modified Atlanta criteria for diagnosis of AP, raised serum amylase/lipase levels are one of the three important criteria besides classic symptoms and radiological imaging. Serum lipase in particular has high sensitivity and specificity for AP ranging from 82 to 100 percent.² In comparison to amylase, which usually returns within 3-5 days from the onset of pain to its normal level, serum lipase remains elevated for 8-14 days.³ Hence raised levels of serum lipase are considered to be specific for AP. Nevertheless, a few cases of AP with normal lipase levels have also been reported.⁴⁻¹³ We report a similar case of AP, where serum lipase levels surprisingly remained normal throughout the course of the disease. Moreover, a brief review of all such case reports published till 2021 is presented here in a tabulated form (Table 1 and 2, and Figure 1,2,3).

Case Report

A 42-year-old female, without any previous medical illness, developed epigastric pain radiating to the back. The pain was associated with 2-3 episodes of non-bilious non-blood-tinged vomiting every day. She denied any addiction. She consulted her local healthcare centre for her symptoms. Her routine blood investigations were essentially normal. She was given oral antibiotics, paracetamol, and ondansetron. She had some relief in pain but no relief in nausea and vomiting. Her serum amylase and lipase levels were also obtained which remained within normal limits on all 3 occasions when tested. Ultrasonography (USG) of the abdomen was carried out without any conclusion on account of gaseous shadows.

After about 15 days of her illness, she reported to our ED with fever, exaggerated pain abdomen, and vomiting. During the initial evaluation, her pulse rate was 96/min, Blood Pressure (BP) was

Correspondence: Om P Sanjeev, Emergency Medicine Department, Sanjay Gandhi Post Graduate Institute of Medical Sciences, House No. 429; Sanskriti Enclave, ELDECO UDYAN-2, Raebareli Road, Lucknow, 226025 UP, India.
E-mail: opsanjeev@gmail.com

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108/74 mm of Hg, respiratory rate was 18/min and her percentage saturation of oxygen (SPO₂) was 97% on room air. Examination of the abdomen revealed epigastric tenderness and guarding. On routine laboratory investigations, TLC was 13,800/cmm, amylase 145U/L, and lipase 29.6U/L. Bedside screening USG abdomen showed an echogenic focus with posterior acoustic shadow in Gall Bladder neck region measuring approximately 9 mm and the pancreas still could not be evaluated due to gas shadows. After pain control, she was taken for an intravenous contrast-enhanced CT scan abdomen. It revealed a bulky pancreas with heterogeneous enhancement suggestive of acute necrotizing pancreatitis (CT severity index 8/10) with the peripancreatic collection (Figure 4). The CT Severity Index (CTSI) is based on the grading of pancreatitis and pancreatic necrosis on a contrast-enhanced CT scan of the abdomen. Gall bladder had multiple intraluminal hyper-density likely calculus, corroborating ultrasonography findings.

Her treatment was initiated with empirical broad-spectrum intravenous antibiotics, fluids, other supportive medications, and oral intake as tolerated. On the 18th day from the onset of symptoms *i.e.* on the 3rd day after admission, she developed shock and respiratory distress. She required non-invasive ventilation and noradrenaline infusion at 0.06mcg/kg/hour and was transferred to the Intensive Care Unit (ICU). As shock further worsened, she was started on vasopressin infusion in standard doses for 24 hours. A percutaneous drain under radio-imaging guidance was inserted to drain suspected infective necrotic material. However, she kept deteriorating and after 35 days of stay in the ICU, she died of sepsis, refractory shock, and multi-organ dysfunction syndrome.

Discussion

This case had a substantial delay in the diagnosis of AP. Over-reliance on serum lipase level and non-availability of a CT scan facility at the peripheral centre disguised the actual diagnosis and hence appropriate management could not be initiated in time. On review of literature, twenty-three published cases of AP with normal lipase levels were found available and can be accessed through PubMed search online.⁴⁻¹³ All retrievable information related to demographic profile, aetiologies, outcomes, etc. are presented in Table 1. Contrast-enhanced CT scan abdomen findings of all these cases were available and suggestive of AP with one case having an additional comment of haemorrhagic pancreatitis. Two patients had a history of AP in past. The median duration of presentation to ED from the onset of pain was 4 days. Out of the total 24 cases tabulated here, including our case, 4 patients were non-survivors.

Many a time, AP is a clinical diagnosis with typical symptoms of acute onset of persistent, severe, epigastric pain which often radiates to the back. Point-of-care investigations serum level of lipases, if elevated to more than three times the upper normal range, clinches the diagnosis in presence of classic symptoms.¹⁴ Radiological studies like Contrast-Enhanced Computed Tomography (CECT), Magnetic Resonance Imaging (MRI), or transabdominal ultrasonography declaring characteristic findings (pancreatic edema/necrosis, etc) confirms the diagnosis. The presence of any two of the above (pain, raised lipase, and radiological findings) is considered diagnostic of acute pancreatitis as per revised Atlanta criteria 2012. However increase in serum amylase or lipase is caused by a variety of diseases and therefore, non-specific for diagnosing AP. Like, serum amylase levels might be high in the absence of AP in diseases of the salivary glands, and in extrapancreatic inflammations, including acute appendicitis,

Table 1. Retrievable data sources.

Sl. No.	Name of journal	Reference No.	Year of Publication	Number of cases described
1.	Emergency Medical Journal	4	2006	1
2.	Journal of Pancreas	5	2010	3
3.	American Journal of Emergency Medicine	6	2016	8
4.	Turkish Journal of Emergency Medicine	7	2016	2
5.	Journal of Pancreas	8	2016	2
6.	Journal of Clinical Lipidology	9	2017	1
7.	American Journal of Emergency Medicine	10	2017	1
8.	Case Reports in Gastroenterology	11	2017	2
9.	Turkish Journal of Gastroenterology	12	2017	2
10.	Medicine	13	2019	1

Table 2. Summary of demographic and symptomatologic profiles of 23 pre-published cases and the case presented here.

Category	Parameters	Results
Demographic profile and Co-morbidities	Age in years (median, IQR) Sex (male/female) Co-morbid illness	49 (19) 15/9
DM/HTN/HL/CAD/Others	DM: 9; HTN: 8; HL: 4; CAD: 3; CKD: 2; Addiction	Alcohol: 8; smoker: 1; marijuana: 1
Symptomatology	Pain abdomen Vomiting Fever Others	Present in 23 out of 24 cases Present in 19 out of 24 patients Present in only one patient Diahhroea: 2; abdominal distension: 1

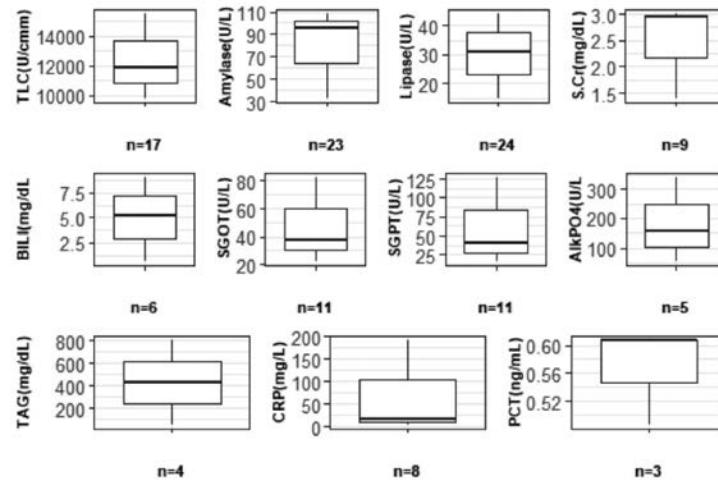


Figure 1. Graphical presentation of available laboratory investigations of all cases in Median and IQ Range.

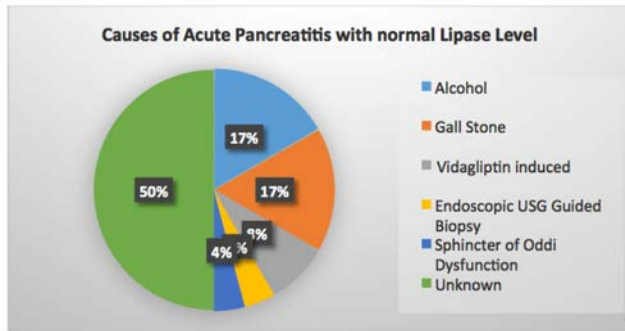


Figure 2. Pie-Chart showing causes of acute pancreatitis with normal lipase level.

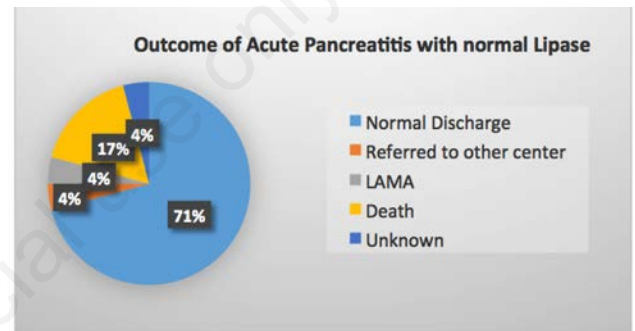


Figure 3. Pie-chart showing outcome of acute pancreatitis with normal serum lipase level.

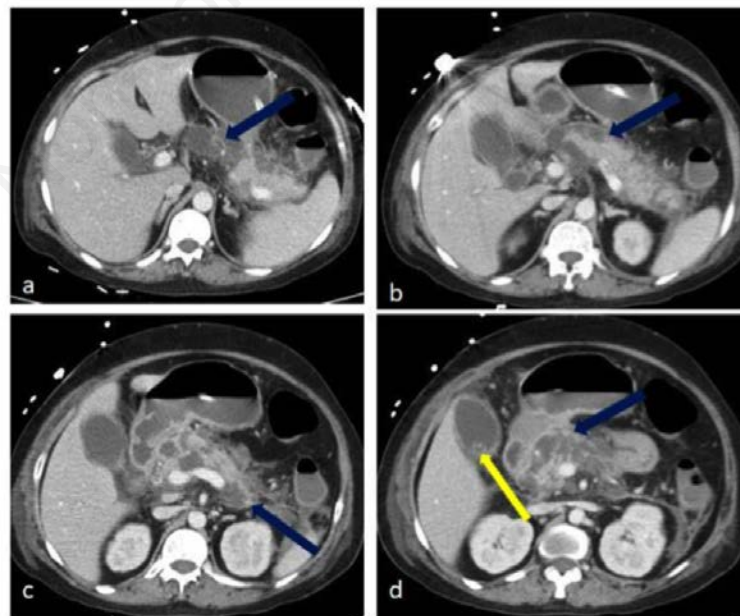


Figure 4. Axial CECT images (venous phase of CT Angio study) showing pancreatic necrosis with pancreatic-peripancreatic fluid collections (dark blue arrows), more marked in the head and proximal body region of the pancreas. Also noted is cholelithiasis (yellow arrow) with mild diffuse GB wall thickening.

cholecystitis, intestinal obstruction, or ischemia, peptic ulcer, and several gynecological diseases.

Serum lipase is more specific for AP, rises within four to eight hours of the onset of symptoms, peaks at 24 hours, and returns to normal within 8 to 14 days.³ Lipase elevations occur earlier and last longer as compared with elevations in amylase and are therefore especially useful in patients who present >24 hours after the onset of pain.¹⁴ Serum lipase is also more sensitive as compared with amylase in patients with pancreatitis secondary to alcohol. Other than amylase and lipase, Trypsinogen Activation Peptide (TAP), a five amino-acid peptide that is cleaved from trypsinogen to produce active trypsin, is elevated in acute pancreatitis. Since activation of trypsin is likely early event in the pathogenesis of acute pancreatitis, TAP may be useful in the detection of early acute pancreatitis and as a predictor of the severity of acute pancreatitis.¹⁵

Conclusions

We conclude that acute pancreatitis can well happen even with normal serum lipase levels. Hence physicians should suspect pancreatitis based on classic signs and symptoms. The imaging should be stressed especially abdominal CT scan with IV contrast (preferred if no contraindication) for confirmation of a diagnosis of pancreatitis. Normal pancreatic enzyme levels cannot rule out the diagnosis of Acute Pancreatitis on its own.

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