

## *Please read this bit first*

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

## CHEMISTRY LEGEND

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## HYPERAMYLASAEMIA

### Case presentation

A 27 year old woman, who was twelve weeks pregnant, was admitted to the hospital with severe vomiting and acute mid-abdominal pain. The pain was of sudden onset and radiated through the back. The patient was febrile but not jaundiced. There was no evidence of any recent alcohol intake. Her plasma electrolyte values were normal but she had a plasma amylase of 3100U/L (normal: <300U/L).

### Differential diagnosis

The provisional diagnosis was acute pancreatitis and the differential diagnosis included small gut obstruction and ruptured ectopic pregnancy.

### Investigation

A high plasma amylase (>1000-2000U/L) is usually considered to be due to acute pancreatitis, but this disease can also be associated with only slightly increased or normal levels. High plasma amylase levels may also be seen in a variety of non-pancreatic disorders.

### Causes of hyperamylasaemia

#### Pancreatic disorders

Acute pancreatitis: alcohol, biliary tract disease, trauma, hyperlipidaemia, carcinoma  
Drugs: thiazides, frusemide, azathioprin, glucocorticoids

#### Non-pancreatic abdominal disease

Perforated peptic ulcer, intestinal obstruction, ischaemia of small bowel, ruptured ectopic pregnancy, salpingitis

#### Miscellaneous

Salivary glands: mumps, duct obstruction  
Tumors: carcinoma of bronchus, ovary, colon  
Renal failure  
Diabetic ketoacidosis  
Macroamylasaemia  
Drugs: opiates

From the clinical aspect hyperamylasaemia presents as two problems:

- Hyperamylasaemia associated with acute abdominal pain
- Hyperamylasaemia not associated with abdominal pain

## Hyperamylasaemia and acute abdominal pain

The association of hyperamylasaemia and acute abdominal pain can be classified into 3 groups:

- Acute pancreatitis
- Acute non-pancreatic abdominal conditions, e.g. perforated ulcer, obstructive gut disease
- Other abdominal conditions not due to the 2 above conditions associated with miscellaneous causes of hyperamylasaemia

The differentiation of these 3 conditions usually has to be made on clinical grounds, but there are a number of lab investigations that may be useful - amylase: creatinine clearance ratio; liver function test; renal functions; plasma glucose; plasma lipids. Although these lab tests and severity of the hyperamylasaemia may be useful in determining the presence of acute pancreatitis, the final diagnosis rests on clinical examination.

## Hyperamylasaemia not associated with abdominal pain

In the absence of abdominal pain hyperamylasaemia is usually of the persistent variety and only moderately elevated (<1000 U/L).

### Causes of a persistently elevated plasma amylase

#### Pancreas

Persistent acute pancreatitis

Complications of pancreatitis: pseudocysts, ascites, abscess

Carcinoma

#### Non-pancreatic

Salivary glands: tumours, infections (mumps), calculi

Renal insufficiency

Macroamylasaemia

Tumours: carcinoma of bronchus, colon, ovary

Salpingitis

## Case discussion

The patient was admitted to the ward and treated conservatively pending further investigation including an obstetrical consultation. An obstetrician considered the possibility of a ruptured ectopic pregnancy unlikely. Liver function tests and amylase: creatinine clearance ratio (AACR) revealed the following elevated results:

Plasma	ALP	285 U/L (30 - 120)	Urine AACR	10.4% (<7)
	ALT	305 U/L (<35)		

The AACR suggested acute pancreatitis; the liver function tests indicated hepatobiliary disease. Conservative treatment of the patient was continued. The next day the plasma amylase was 1220 U/L and the following day it fell to 550 U/L.

## Final diagnosis

The patient settled down on conservative therapy and was discharged from hospital 2 weeks later. A cholecystogram revealed multiple small stones in her gall bladder. The final diagnosis was acute pancreatitis secondary to cholelithiasis. The abnormal liver function tests which resolved during her stay in hospital, probably reflected as ascending cholangitis.

## References

1. Cases in chemical pathology - A Diagnostic approach 4<sup>th</sup> edition

## Questions

1. Discuss the causes of hyperamylasaemia.
2. How does hyperamylasaemia present clinically?
3. Discuss the lab findings in a patient with hyperamylasaemia.