

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.

May 2007

Lactate dehydrogenase (LD)

Case presentation

A pale, slightly jaundiced man of 57 years, with an unsteady gait, was admitted from a nursing home for investigation of possible liver disease. Examination revealed a pale, slightly icteric man with a 'beefy' red tongue, a slightly enlarged liver, and a palpable spleen. There was also loss of sense of vibration in, and coordination of, his lower extremities. His haemoglobin concentration was 7.5 g/dL (normal 13-18); the results of his liver function tests are shown below.

Plasma

TProt	69	g/L	(62-82)
Alb	39	g/L	(30-50)
ALP	105	U/L	(30-120)
Bili	46	$\mu\text{mol/L}$	(<20)

Plasma

ALT	35	U/L	(<35)
LD	1680	U/L	(125-250)
GGT	30	U/L	(<45)

Differential diagnosis

This patient's provisional diagnosis was haemolytic anaemia but the possibilities of pernicious anaemia and liver disease were also considered.

Investigation of a high plasma LD activity

Lactate dehydrogenase has a wide tissue distribution (heart, skeletal muscle, kidney, liver, blood cells, etc.) and high plasma levels are often found in clinical medicine (Table 13.7). In most instances the tissue of origin of a high plasma LD can be easily identified from the patient's clinical features, or from the values of other biochemical tests, e.g. liver function tests, plasma CK activity. Very few patients present with an increased plasma LD level of uncertain origin. In these rare cases the tissue of origin can usually be identified by evaluation of the LD isoenzymes.

Table 13.7. Causes of a raised plasma lactate dehydrogenase

Myocardial disease

Myocardial infarction, Myocarditis

Liver disease

Hepatocellular disorders

Skeletal muscle disease

Trauma, Muscular dystrophy, Dermatomyositis, Myoglobinuria

Miscellaneous

Haematological: haemolysis, leukaemia, pernicious anaemia, myeloproliferative disorders; Malignancy (all types); renal infarction; Pulmonary embolus; Hypothyroidism; Acute pancreatitis

Case discussion

The LD isoenzyme pattern in this patient showed a predominance of LD₁ and LD₂. This, and the normal levels of plasma ALT and ALP, suggested that there was no, or insignificant, liver cell damage. A blood film revealed a macrocytic anaemia and a bone marrow biopsy showed a megaloblastic picture.

Final diagnosis

Vitamin B₁₂ studies disclosed a deficiency of this vitamin and the patient was given a diagnosis of pernicious anaemia. In this disorder the high plasma bilirubin and LD levels were due to the destruction of the abnormal red cell precursors in the bone marrow and spleen.

CPD Questions:

1. Can a lysed blood specimen be used to measure plasma LD levels?
2. How many isoenzymes of LD are found and which are raised in liver cell damage?