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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 2008

Hypoproteinaemia

Case presentation

A 47-year-old man, with a carcinoma of the stomach, had a low plasma albumin concentration which was resistant to treatment by high protein intake, and/or IV albumin infusions. His plasma and urinary biochemistry results are shown below.

Plasma

Ca	1.86 mmol	(2.15-2.55)
PO_4	1.05 mmol/L	(0.65-1.25)
TProt	39 g/L	(62-82)
Alb	22 g/L	(30-50)
ALP	450 g/L	(30-120)
ALT	19 U/L	(<35)
Bili	4 µmol/L	(<20)
Iron	2 µmol/L	(14-29)
TIBC	30 µmol/L	(45-72)

Urine

24 h protein	0.01g	(<0.15)

Differential diagnosis

The possible causes of the hypoproteinaemia include: *malignancy, liver dysfunction, protein-losing enteropathy*

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Evaluation of hypoproteinaemia

A low plasma protein level, providing there is no haemodilution, may be due to hypoalbuminaemia or hypogammaglobulinaemia or both.

In most patients with hypoalbuminaemia the cause is usually obvious from the clinical picture. If the aetiology is obscure a 24-hour urinary protein estimation and liver functions tests should be performed to exclude the renal loss of protein and liver disease.

Liver disease, of sufficient severity to results in decreased albumin synthesis, will usually be evident from the liver function tests. However, quiescent cirrhosis can occasionally exhibit fairly normal results (except, perhaps, for a high plasma alkaline phosphatise). In these subjects specific liver function tests (BSP excretion, bile acids, may be necessary to confirm the diagnosis.

If nephritic syndrome and liver disease have been excluded then the possibilities are protein-losing enteropathy, malnutrition, malabsorption, or some chronic or acute disease process (acute and chronic infections, malignancy, collagen disease, etc.).

Case discussion

Malignancy *per se* can result in a low plasma albumin due to poor nutrition and various other non-specific reasons (e.g. ? toxic suppression of albumin synthesis), but most of such afflicted patients show some response to a high protein intake.

The above patient had secondary malignancies in the liver, as evidenced by the high plasma alkaline phosphatise level, but his blood clotting studies (prothrombin time) were normal which suggested that liver dysfunction was an unlikely cause of the low albumin.

Final diagnosis

Protein-losing enteropathy

The massive protein loss via the gut in this patient resulted not only in a low plasma albumin concentration but also low levels of globulins (17 g/L, normal range: 28-38), and transferrin (TIBC). Multiple plasma protein deficiencies, are characteristic of protein-losing states.

CPD Questions:

1. Discuss other clinical conditions which could have resulted in this low (plasma) globulin found in this patient.
2. What other reasons could there be for this patients high (plasma) alkaline phosphatose?
