Investigation vignette

An 83-Year-old Man Admitted to Hospital Drowsy, Confused, Hypotensive and With Generalised Rigidity

CASE REPORT

An 83 year-old man was admitted to the emergency department hypotensive, drowsy and confused. He had a past history of type II diabetes, peripheral vascular disease, heart failure and atrial fibrillation, although he had been managing to live by himself with minimal support following the death of his wife 10 years ago.

His diabetes had been controlled by diet and his medications consisted of spironolactone and captopril. However, for the previous three months he had developed intermittent post-prandial vomiting which had become more severe during the last 10 days and for which his local medical practitioner had been administering subcutaneous injections of 10 mg meto-clopramide.

On admission he was in sinus rhythm, with a heart rate of 72 beats per min, blood pressure 80/50 mmHg and temperature 38.6ºC. As he also exhibited generalised rigidity, a provisional diagnosis of tetanus was made. A venous blood sample was sent for electrolytes, renal function and liver function tests (Figure 1). One litre of 0.9% saline was administered before he was admitted to the intensive care unit for further management, where arterial and central venous catheters were inserted.

Name	Age	Sex
Mr. L. J.	83	M

Sodium	137	mmol/L	(137 - 145)
Potassium	7.2	mmol/L	(3.1 - 4.2)
Chloride	82	mmol/L	(101 - 109)
Bicarbonate	50	mmol/L	(22 - 32)
Anion gap	12.2	mEq/L	(8 - 16)
Calc Osmolarity	338	mosmol/L	(280 - 300)
Glucose	16.2	mmol/L	(3.0 - 6.0)
Urea	48.2	mmol/L	(3.0 - 8.0)
Creatinine	0.65	mmol/L	(0.05 - 0.12)
Urate	0.95	mmol/L	(0.25 - 0.45)
Phosphate	2.88	mmol/L	(0.70 - 1.25)
Total Calcium	2.12	mmol/L	(2.10 - 2.55)
Albumin	46	g/L	(39 - 50)
Globulins	38	g/L	(22 - 35)
Cholesterol	3.7	mmol/L	(desirable < 5.5)
Total Bilirubin	22	μmol/L	(4 - 20)
GGT	55	U/L	(0 - 50)
ALP	220	U/L	(30 - 100)
LD	210	U/L	(110 - 230)
AST	48	U/L	(10 - 45)

Figure 1. The plasma biochemical profile on the venous sample taken on admission to the intensive care unit

Diagnosis: Acute and chronic renal failure with hyperkalaemic alkalosis and a dystonic reaction to metoclopramide

The patient was given a further 500 mL of 0.9% saline and treated with 2 mg of benztropine intravenously. Within 5 minutes the generalised rigidity abated. The biochemical profile of the venous blood sample sent on admission to the intensive care unit revealed hyperkalaemic alkalosis.

While a single disorder may cause hyperkalaemic acidosis, hypokalaemic acidosis or hypokalaemic alkalosis, the biochemical picture of hyperkalaemic alkalosis is almost always caused by two clinical disorders. This patient had type II diabetes with a history of intermittent vomiting due to gastroparesis. The alkalosis was caused by persistent vomiting, although the hyperkalaemia was due to the presence of acute and chronic renal failure (probably caused by dehydration and diabetic nephropathy respectively) and coexistent spironolactone and captopril therapy.

Metoclopramide, a dopamine-2 receptor antagonist used for various gastrointestinal disorders, may cause or exacerbate a variety of extrapyramidal movement disorders, including parkinsonian syndrome (with generalised rigidity or tremor) or dyskinesia (with abnormal limb postures).[1-3] The disorder may also be more prevalent in patients with renal failure.[4]

The patient had many acute disorders (e.g. dehydration, metoclopramide induced parkinsonian syndrome) as well as chronic disorders (e.g. renal failure, diabetic neuropathy with gastroparesis) indicating that the cause of the biochemical and clinical disturbances was probably multifactorial.

William of Occam (a medieval philosopher/ theologian who lived from 1285 to 1349) stated that when solving any problem "pluratitas non est ponenda sine necessitas" (plurality should not be proposed without necessity).[5] This principle is one of the basic teachings in clinical medicine (i.e. parsimony of diagnosis) and is often successfully used when explaining the presence of numerous and complex abnormal clinical features.[6-8] However, when dealing with an aging population who can have many underlying disorders and who have medications that often interact, the concept of a single diagnosis may lead to an incorrect assessment of the patient.[9,10]

The patient's initial arterial blood gas revealed a PO_2 of 54 mmHg, PCO_2 of 58 mmHg pH of 7.54 and HCO_3^- 48 mmol/L. A further 2 litres of 0.9% saline and a continuous insulin infusion were administered over the next two hours with the potassium decreasing to from 7.2 mmol/L to 5.8 mmol/L and then to 3.5 mmol/L after a further 12 hours. A mild rigidity returned after 6 hours, which abated once again with 2 mg of benztropine. Thereafter the rigidity did not reoccur.

The long-term management of the patient's gastroparesis was managed with erythromycin[11,12] without further dystonic problems.

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