Unusual presentation of more common disease/injury

Prolonged QT interval in bulimia nervosa

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A 39-year-old woman with an unremarkable history presented to the emergency department with three episodes of collapse. Each episode was witnessed by her son who described a loss of consciousness followed by rapid and complete recovery. The patient appeared well and examination was unremarkable. Her ECG showed a marked QTc prolongation of 642 ms (normal <470 ms) and low serum potassium at 1.8 mmol/l (3.5–5.3 mmol/l). The patient was moved to the coronary care unit and started on potassium replacement. On the ward a thorough history was taken and the patient confessed to being very conscious about his body shape and weight and admitted to episodes of binge eating and self induced vomiting. Her history suggested bulimia nervosa which is known to cause electrolyte disturbances and cardiac arrhythmia.^{1–4} Over the following 2 days the patient's potassium increased and the QTc interval normalised; the patient was discharged with an outpatient referral for a psychiatric opinion.

BACKGROUND

- ▶ The case illustrates a life threatening complication of bulimia nervosa (BN).
- ▶ It clearly demonstrates the relationship between serum potassium and QT interval, something read about in text books but not commonly seen on the acute medical take.
- ▶ The cause for this patient's low potassium had not been previously identified, this case demonstrates the need for a thorough history and direct questioning in order to establish a diagnosis.
- ▶ There appears to be no other published case reports on the relationship between BN, QT interval and collapse.

CASE PRESENTATION

A 39-year-old woman presented with three episodes of collapse witnessed by her son with loss of consciousness lasting 2–3 min on each occasion. There were no associated features such as incontinence, tongue biting or palpitations. The previous day she had been well but confessed to recurrent self induced vomiting.

She had an unremarkable medical history having been seen on one occasion by her GP for low potassium. She was on no regular medicines, did not smoke and consumed moderate amounts of alcohol.

Examination was unremarkable, she was slim, tanned, appeared systemically well and wanted to go home.

INVESTIGATIONS

Relevant investigations at admission:

Arterial blood gas:

- ▶ pH – 7.62 (7.35–7.45)
- ▶ pO₂ – 8.8 (10–12)
- ▶ pCO₂ – 6.1 (4.7–6)
- ▶ HCO₃⁻ – 28 (20–26)
- ▶ Serum sodium – 127 mmol/l (135–145)

- ▶ Serum potassium – 1.8 mmol/l (3.5–5.3)
- ▶ Serum magnesium – 0.69 (0.7–1)
- ▶ Adjusted calcium – 2.41 (normal)
- ▶ Urine sodium – 19
- ▶ Urine potassium – 22
- ▶ Trop I 12 h following collapse <0.01 (negative)
- ▶ ECG QTc interval 642 ms (470 ms is the upper limit of normal in females)
- ▶ Slight ST depression V3–V6.

DIFFERENTIAL DIAGNOSIS

- ▶ Vaso-vagal syncope
- ▶ Seizure
- ▶ Postural hypotension.

TREATMENT

Oral and intravenous potassium replacement through a central line while on a cardiac monitor.

OUTCOME AND FOLLOW-UP

Hypokalaemia and ECG abnormalities had returned to within normal levels 2 days after admission, the patient was discharged and referred for an outpatient psychiatric opinion.

DISCUSSION

There are no other case reports describing arrhythmias, collapse and BN.

However, literature demonstrates that BN is significantly correlated to QT prolongation when compared to controls and it has also been noted that this correlation is not confined to those patients with below normal weight.^{1–3}

QT prolongation has been noted to return to normal as an acute episode of BN resolves but that these changes occur independently of electrolyte disturbances, the reasons for which remain unclear.¹

Figure 1 ECG taken at the time of admission in the emergency department, the QTc is 642 ms throughout all leads. There is marginal ST depression in leads V2–V5. At the time of this ECG the patient's potassium was 1.8 mmol/l (3.5–5.3 mmol/l).

Figure 2 ECG taken 2 days following admission just prior to discharge, the QTc has normalised to 432 ms. The patient's serum potassium at this time was 3.3 mmol/l.

In this case report the patient's QT interval improved during the admission, as this was closely correlated to an increasing serum potassium it seems reasonable to suppose that the ECG abnormality was directly due to the low potassium and not the underlying disease.

Learning points

- ▶ An ECG should be an important part of medical assessment in any patient with a history of BN.
- ▶ Consider BN in the differential diagnosis of any patient presenting with unexplained electrolyte abnormality or arrhythmia.
- ▶ A thorough and direct history may need to be taken often away from relatives in order to establish details of bingeing and purging behaviours.

Competing interests None.

Patient consent Obtained.

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