A Case Study: Surviving the Unsurvivable

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Background

- We present a 50 year old lady found unresponsive but breathing, with severe hypothermia 24.8°C, hypoglycaemia 1.7mmol/L, bradycardia 32bpm, and an initial blood pressure of 107/87mmHg which dropped to 74/58mmHg.

- Her initial VBG demonstrated a potassium of 0.9mmol/L which was confirmed on a subsequent ABG taken minutes afterwards.

- She had been under recent investigation under Gastroenterology team for haematochezia with colonoscopy & had a CT scan of her abdomen and pelvis with no significant pathology identified.

- She had been cachectic with a BMI of 12.83 kg/m².

- She had a poor diet consisting mainly of weight-loss milkshakes, and excessive exercise with a suspected diagnosis of Anorexia Nervosa.

Immediate Resuscitation

- Commenced intravenous fluid 0.9% Sodium Chloride 1.5L
- Intravenous 10% glucose administered by ambulance service pre-hospital.
- Intravenous potassium replacement initially commenced at a rate of 40mmol over 2 hours. With Intensivist support, a central line was inserted and the rate was increased to 40mmol per hour which continued for 2.5hrs.
- The patient was actively warmed with a Forced-air Patient Warming system.
- She was placed on cardiac telemetry.

Problems for the Patient

- Severe hypokalaemia
- Severe Hypoglycaemia
- Severe hypothermia 24.8°C
- Hypotension 74/58mmHg
- Bradycardia 32bpm

Further history

- She had a poor diet consisting mainly of weight-loss milkshakes, and excessive exercise with a suspected diagnosis of Anorexia Nervosa.
- She had been under recent investigation under Gastroenterology team for haematochezia with colonoscopy & had a CT scan of her abdomen and pelvis with no significant pathology identified.

Table showing blood results with improving serum potassium over time.

Discussion

- Survival of such life-threatening hypokalaemia alongside hypoglycaemia, hypothermia, bradycardia and hypotension, without cardiac arrest or invasive organ support, is extraordinary, and was attributed to chronic deterioration with physiological tolerance over several months. The cardio-protective properties of hypothermia undoubtedly enabled survival and rapid recovery.

- The troponin rise was attributed to the electrolyte imbalance, cardiac arrhythmia and shock.

Outcome

- Recovering well, she self-discharged 48 hours later after formal mental capacity assessment, but re-presented within hours to voluntarily accept nutritional and psychiatric input.

Learning Points

- Severe hypothermia and hypokalaemia can cause life threatening bradycardia which can lead to cardiovascular collapse if not managed urgently as a medical emergency.
- Patients with hypothermia should have prolonged resuscitation whilst being actively re-warmed.
- Patients with suspected eating disorders should be managed in a specialist environment once medically stable.

Figure 1: Initial VBG

Figure 2: ECG pre-treatment

Figure 3: Blood serum results

Sinus bradycardia with ventricular bigeminy, prolongation of PR interval, T wave flattening & inversion, probable U wave merging with inverted T wave causing apparent long QT interval, heart rate 32bpm.

Narrow complex sinus rhythm of 66 bpm with ongoing widespread T-wave inversion.