

B6.0 Diabetes

6.1 Hyperglycaemia

Diabetic ketoacidosis

This typically presents with a 2-3 day history of gradual deterioration, perhaps precipitated by infection with dehydration acidosis and coma. The dehydration is more life threatening than the hyperglycaemia.

History

- DKA coma may be the first presentation of Diabetes in a young patient. The history is usually of polydipsia and polyuria for several weeks with weight loss. This may have worsened and the patient may present in varying degrees of coma.
- Usually however the patient is a known type I diabetic and has had an intercurrent illness over a period of a few days which has destroyed glycemic control. The commonest illness that will do this are Chest infection, UTI, D&V
- DKA may occur from non compliance with medication.

Examination

A: this may be impaired in the comatose patient, particularly ones that are vomiting.

B: this is typically Kussmaul in nature with a ketotic odour. High flow O₂ should be given

C: Severe dehydration may lead to vascular collapse with tachycardia & hypotension

D: This will vary and needs to be continuously monitored on a GCS. Coma improves with deterioration but can deteriorate if cerebral oedema develops

The underlying cause for the precipitation of DKA should be sought

Investigations

BM

ABG(VBG)

U&E

Urine dipsticks

Blood cultures

CXR

Osmolality

Treatment

A: protect the airway

B: supplemental O₂

C: IV access

1. **Fluids**-Treat with N saline 1litre in the first hour. This is followed by 500ml/hr for next 4 hrs and then 500ml/2hrs.. Persistent hypotension may require an increase in the rate. However it is important to avoid over rapid administration as this may lead to pulmonary/cerebral oedema.
2. **Insulin:** iv soluble insulin at 6U/hr. When the BM<14 then 3U/hr and replace N saline with 10% dextrose to allow ketone clearance

1. **Electrolyte balance:** Although total K is low, the serum K may be high. With treatment, K enters the cells and serum K decreases rapidly. Therefore K should be given in the Saline infusion (20mmol/l per KCl) unless the K is >5.5mmol/l
2. **Signs of infection:** These can be masked. Temp may not be increased and the raised WCC may be a sign of ketonaemia. If in doubt treat with antibiotics
3. **Clotting:** DKA is a hypercoagulable state and increasing the chance of DVT and PE Prophylaxis should be administered

Monitoring

All patients should have at least:

Pulse

BP

Urine catheter with hourly output

NG tube

GCS

ECG monitor

Disposal:

Referral for admission to ITU or HDU may be required. The key to success is continuous monitoring.

Hyperglycaemic hyperosmolar non ketotic coma

- This presents with a longer history (1 week) with marked dehydration and a glucose >35mmol/l
- Acidosis is absent as there is no switch to ketosis
- The patient is often old and presenting for the first time
- The osmolality is >340mmol/l with a Na > 150
- Treatment is similar to DKA but use 0.45% saline due to the high Na
- Infuse insulin at 3u/hr
- anticoagulate

6.2 Hypoglycaemia

History

The patient is always symptomatic but may not realise why or able to provide a history

This must be considered in any confused, disorientated, aggressive or excitable patient - the 'drunk' swearing at you at 07:30 is probably hypoglycaemic not drunk. Don't forget alcohol may precipitate hypoglycaemia, especially in children, and other patients with poor glycogen reserve. Hypoglycaemia coma is a true emergency. The quicker you reverse it, the more brain cells you'll preserve!

Examination

This may range from the acutely confused and aggressive patient to those patients with a GCS of 3. Always look for a medical alert bracelet as the majority of patients are Diabetic who have taken too much insulin or not enough food. Always consider the possibility of a suicidal attempt.

Investigation

BM is the only real test required. Do not wait for serum glucose levels if you suspect hypoglycemia

Treatment

A; Protect the airway in the collapsed patient

B: Ventilate as Necessary

C: Support the circulation

If the patient can drink then give oral glucose, if not then establish iv access and give 50 ml of 50% dextrose.

Glucagon is a useful drug. It is often given in the pre-hospital setting by the ambulance crew, and should be given if there is difficulty getting intravenous access. The dose is 1 mg IM (or iv). Don't forget that there is a delay in its onset of action of about 5-10 minutes, and that its effects are short lived.

Always give something by mouth to all diabetics when they regain consciousness.

Patients do not need to be admitted after a single episode of hypoglycaemia and their diabetic medication should not be altered unless first discussed with their diabetologist looking after them, but **admit all patients hypoglycaemic because of oral hypoglycaemic agents.**

If the patient is not being treated for diabetes take venous blood (BEFORE treatment) for glucose, insulin and c-peptide levels. Put these samples on ice and speak to the lab.

If the patient is a known diabetic on drugs then the reason for the hypoglycaemia should be sought.

<p>Always consider and exclude hypoglycaemia as a cause of the patient's symptoms or a response to their illness.</p>
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