on the pods

Part 2: Blood glucose monitoring – Hypoglycaemia

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Introduction
Part 2 continues the discussion of blood glucose management on the wards. Hypoglycaemia remains a commonly encountered situation requiring management and review, and requires junior doctors to have a thorough understanding of more general diabetes management and control.

Case 1 – You are a junior doctor on the wards. Nursing staff contact you to report a patient with a blood glucose level (BGL) of 3.0 mmol.

1. **Immediate management if patient capable of oral intake**
   - Patient requires rapid acting glucose, approx. 15 gm initial dose
     - E.g. Half cup of juice/soft drink, 3 teaspoons of honey, 6 jelly beans, oral glucose
   - Note: do not mix these with longer acting forms of carbohydrate, e.g. the patient's meal, as this will decrease absorption of rapid acting glucose
     - As such, the patient should cease any meal until BGL>4.0 mmol
   - Monitor BGL every 10-15 minutes until BGL>4.0 mmol
   - If BGL levels remain low, give further 15 gm rapid acting carbs
   - If BGL>4.0 mmol, proceed to meal/more substantial food
   - Once hypoglycaemia has been adequately treated, check BGL hourly for the next 4-6 hours
     - Note: active longer acting insulin or sulfonylureas may still place the patient at risk of hypoglycaemia recurring for up to 12-24 hours

2. **Immediate management if patient incapable of oral intake**
   - Due to decreased mental state or physical limitations, patient may not be able to take glucose orally
   - Administer 150 mL 10% dextrose IV (=15 g glucose)
   - Option of 50% dextrose IV push, however this may irritate vein
   - If unconscious, consider additional glucagon injection
     - Although this should be avoided unless absolutely necessary

3. **Investigating Causes of Hypoglycaemia**
   - Once the patient is stabilised, it is important to assess why the hypoglycaemic event occurred in order to prevent future recurrence
   - Causes of hypoglycaemia may include:
     - Medications given when patient fasting
     - Patient not eating (full) meals
     - Changes to steroid doses
     - Enteral/NGT feeding where an occlusion has occurred in the lumen but not been recognised

4. **Fasting**
   - Planned fasting
     - Withhold all oral medications, especially SGLT2 inhibitors (generally cease these during inpatient stays)
     - Withhold meal-time insulin (correction insulin still permissible)
   - Unplanned fasting
     - Rapid review of all medications with individualised plan, ensuring IV cannula in and dextrose commenced and increased frequency of monitoring

5. Does the patient need an Endocrine Review?

- Simply having diabetes is not an indication for referral of a patient to the Endocrinology team
- Patients with diabetes should be referred for formal consultation if they meet any of the following criteria:
    - Type 1 diabetes
    - Insulin pump therapy
    - Diabetes managed with complex regimens
    - Diabetes with eating disorders
    - Insulin treated patients requiring enteral feeds
    - Patients on concentrated insulin, e.g. 300 Units/mL or 500 Units/mL
    - Pregnancy
    - Diabetes emergencies
- Patients with diabetes should be considered for referral (formal or informal advice) if they have:
    - Poor glycaemic control (HbA1c over 9%)
    - Unstable diabetes
    - Perioperative preparation advice
    - Recurrent hypoglycaemia
    - Persistently elevated glucose levels despite medication adjustment
    - Steroid therapy
- Any patient newly commenced on insulin as in inpatient and who is likely to require ongoing insulin post discharge needs timely referral to diabetes services

Take home messages

- All episodes of hypoglycaemia require a plan for rapid acting carbohydrate, increased BGL monitoring and a thorough review of potential causes
- Endocrine review is not compulsory for all inpatients with diabetes, but should be requested for all patients with type 1 diabetes and all patients type 2 diabetes who have complex insulin regimens or more complex medical status