Clinical Practice Guidelines: Medical/ Diabetic emergency: Hyperglycaemia

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<tr>
<td>Purpose</td>
<td>To ensure consistent management of patients with Hyperglycaemia.</td>
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<td>Scope</td>
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Hyperglycaemia is defined as a fasting blood glucose level (BGL) greater than 7 mmol/L. In the diabetic patient hyperglycaemia can present as Diabetic Ketoacidosis (DKA), Hyperosmolar Hyperglycaemic Syndrome (HHS) or be asymptomatic.

DKA and HHS are predominantly caused by:
- Acute illness (e.g. infection, ACS, CVA)
- Non-compliance with medication.

DKA is a life-threatening complication usually seen in patients with Type 1 Diabetes Mellitus that is characterised by:
- Hyperglycaemia
- Ketosis
- Metabolic acidosis.

It is caused by an absolute insulin deficiency or resistance, precipitating a number of physiological changes:
- High BGL increases blood osmolarity drawing water out of cells resulting in cellular dehydration.
- High BGL in the kidney filtrate results in osmotic diuresis and polyuria leading to severe dehydration & hypovolaemia. (fluid deficits typically range from 5–8 litres)
- Alternative fuel sources, including fatty acids, are used, producing organic acids known as ketones. Accumulation of these result in a metabolic acidosis.
- Dehydration leading to polydipsia.
- Loss of potassium from the body.

HHS is a life-threatening complication of Type 2 Diabetes Mellitus (T2 DM) that is characterised by:
- Hyperglycaemia
- Hyperosmolarity
- Severe dehydration.

HHS is caused by a relative insulin deficiency, whereby there is sufficient insulin to limit ketone production thus preventing metabolic acidosis. It most commonly presents in patients > 60 and may be the primary presentation of T2 DM. Grossly elevated BGLs still initiate the triad of polyuria, polydipsia and polyphagia, and fluid deficits typically range from 8–10 litres. HHS has a greater rate of mortality due to the severity of underlying illness, typically sepsis.

NOTE: HHS has been known by numerous names, most notably Hyperosmolar Hyperglycaemic Nonketotic Syndrome (HHNS) and Hyperglycaemic Hyperosmolar Nonketotic Coma (HONK), however HHS is more widely accepted now, as coma is not a prerequisite and patients may present with some degree of ketosis.
Clinical features

The clinical features of DKA and HHS are similar:

**Neurological:**
- Lethargy
- ALOC
- Seizure
- Coma.

**Cardiovascular:**
- Signs of hypovolaemia (hypotension, tachycardia)
- Pale, cool or clammy or
- Flushed, hot if febrile.

The exceptions are:
- BGL: DKA (> 10 mmol/L) AND/OR HHS (> 40 mmol/L)
- Kussmaul respiration is due to the severe metabolic acidosis. This is usually not seen in HHS.

Risk Assessment

- Not applicable

Additional information

- **Note** – Although treatment for severe dehydration may be required, correcting fluid deficits too quickly can cause cerebral oedema – especially in children.\(^{[8,9]}\)

Consider:
- IV access
- IV fluid
- Oxygen
- 12-Lead ECG

Transport to hospital
Pre-notify as appropriate

Note: Officers are only to perform procedures for which they have received specific training and authorisation by the QAS.