Acute Presentations of Diabetes

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Acute presentations of Diabetes

- Interactive presentation
- Acute presentations in Diabetes
- Active management of these presentations
- Potential pitfalls in management scenarios
Case 1

- 19 year old female
- T1DM
- Recurrent non-attender at young persons diabetes clinic

- RR 28
- HR 110
- BP – 95/60
- NEWS 7
Assessment

• CBG – 28
• Capillary Ketones – 4.8

• Venous gas
  • pH 7.1, HCO3- 10

• K – 5.3, Na – 137, Creatinine 110
• WCC - 14
What should be the initial fluid for resuscitation?

- 1 5% Dextrose
- 2 10% Dextrose
- 3 Hartman’s
- 4 Normal Saline
- 5 Normal saline with 40mmol KCL
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What insulin would you utilise?

- 1 IVII
- 2 FRIII
- 3 Sliding scale Insulin
- 4 Subcutaneous sliding scale insulin
- 5 VRIII
What insulin would you utilise?

• 1 IVII
• 2 FRIII
• 3 Sliding scale Insulin
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DKA – JBDS-IP 2013

Diagnosis

• Ketonaemia > 3.0mmol/L or significant ketonuria (more than 2+ on standard urine sticks)
• Blood glucose > 11.0mmol/L or known diabetes mellitus
• Bicarbonate (HCO3-) < 15.0mmol/L and/or venous pH < 7.3
• Bolus insulin not required if FRIII within 1 hour
Further Treatment

• Continue basal insulin (Lantus, Levemir, Toujeo, Tresiba)
• If new diagnosis - The TDD can be calculated by multiplying the patient's weight (in kg) by 0.5 to 0.75 units. – 50% delivered by basal insulin

• Focus on adequate fluid replacement
• Maintain K⁺ within normal range

• Treat underlying cause
• Thromboprophylaxis
• Involve Diabetes inpatient team/discharge to Diabetes clinic follow-up
Potential Pitfalls

• DKA in Pregnancy, Young, Elderly, CHF, CKD
• Euglycaemic DKA with SGLT1i use
• Ketosis prone T2DM “mixed picture”
• Education
Case 2

• 68 year old male

• Started on steroids by “hospital” 2 weeks previously

• Continued chest infection

• Wife states increasingly irascible and confused

• PMH – CCF (estimate EF 30%), COPD, CKD
Results

• Glucose 46 mmol/l
• Ketones 2.1 mmol/l

• Na 130, K 4.1, Creatinine 220, (Baseline 120), urea 23

• Venous gas
  • pH 7.2, HCO3⁻ 20
What is your first line management?

• 1 Intravenous Fluid resuscitation
• 2 Intravenous Heparin
• 3 Intravenous insulin
• 4 Oral rehydration
• 5 Stop steroids
What is your first line management?

1. Intravenous Fluid resuscitation
2. Intravenous Heparin
3. Intravenous insulin
4. Oral rehydration
5. Stop steroids
Case 2......continued

Progress
• IV Normal Saline – 3 litres over 8 hours
• BP 100/60

• CBG 35mmol/l
• Ketones 1.1mmol/l
What do you next consider?

• 1 500ml IV 10% Dextrose
• 2 FRIII (0.05 units/kg/hr)
• 3 FRIII (0.1 units/kg/hr)
• 4 Sliding scale insulin
• 5 VRIII
What do you next consider?

- 1 IV 500ml IV 10% Dextrose
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- 3 FRIII (0.1 units/kg/hr)
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- 5 VRIII
Hyperosmolar hyperglycaemic state (HHS)JBDS-IP 2012

• Definition:
  • Hypovolaemia
  • Marked hyperglycaemia (30 mmol/L or more) without significant hyperketonaemia (<3 mmol/L) or acidosis (pH>7.3, bicarbonate >15 mmol/L)
  • Osmolality usually 320 mosmol/kg or more (2Na⁺ + Glc + urea)

• Diagnosis –
  • HHS in steroid induced diabetes
    • HHS aka/formerly known as HONK
HHS – contd.

• FRIII – at half DKA dose (0.05 units/kg/hr), if Glucose slow to respond and Ketones >1
• Ensure continued rehydration – 10L fluid deficient (slow deficit)

• Glucose responds usually without FRIII – beware of hypoglycaemia if FRIII utilised
• AKI will usually resolve to baseline
You decide to anticoagulate the patient. Which of the options would you choose?

• 1 Anticoagulation is contraindicated
• 2 LMWH treatment dose
• 3 LMWH prophylactic dose
• 4 unfractionated heparin
• 5 NOAC treatment dose
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HHS and Anticoagulation

- HHS is a highly prothrombotic state – increased risk of arterial and venous thromboembolism.

- Prophylactic anticoagulation at least indicated.
- Treatment dose Heparin in high risk individuals
  - ..and post discharge?
Controversial areas

• Who takes responsibility for patient care when steroids initiated?
• Outpatient management of steroid therapy and hyperglycaemia
• SUs, Insulin od, Newer agents (e.g. Gliptins – Umpierrez et al 2013)
• Assessment of hyperglycaemia following cessation of steroids

• Mixed picture – DKA v HHS
• Euglycaemic DKA
Hypoglycaemia
Hypoglycaemia - community

• Increased frequency at hospital front door/paramedic care
• Associated with more T2DM elderly patients receiving optimised diabetes care
• Significant burden for patient – e.g. Falls, loss of independence, DVLA
• 50% of presentations to A&E/Paramedics sulphonylurea related
Hypoglycaemia - inpatients

- 72 hours increased inpatient LoS
- Involve Diabetes inpatient team
- Follow local protocols – adapt national guidelines
Algorithm for the Treatment and Management of Hypoglycaemia in Adults with Diabetes Mellitus in Hospital

**Mild**

- Patient conscious, orientated and able to swallow

  - Give 3 – 5 tablets of GlucoTabs or 59ml GlucoJuice Liquid Blast
  - Test blood glucose level after 15 minutes
  - If still less than 4 mmol/L, repeat above up to 3 times
  - If this has been repeated 3 times, consider IV 10% glucose at 100 ml/hr
  - Continue to test blood glucose every 15 minutes until >4mmols/L

**Moderate**

- Patient conscious and able to swallow but confused/disorientated or aggressive

  - If cooperative: administer 1-2 tubes of GlucoGel
  - Ensure gag reflex is present
  - If uncooperative: give 1mg Glucagon IM if suitable (i.e. no repeated hypos, not NBM and no severe hepatic disease)
  - Test blood glucose after 15 minutes, if still less than 4 mmol/L, repeat up to 3 times.
  - If this has been repeated 3 times, consider IV 10% glucose at 100 ml/hr

**Severe**

- Patient unconscious/fitting or very aggressive or nil by mouth (NBM)

  - Check ABC, stop any IV insulin and fast bleep a doctor if suitable (i.e. no repeated hypos, patient not NBM and no severe hepatic disease)
  - Give 1 mg Glucagon IM or give IV 10% Dextrose 150mls over 5 minutes
  - If still less than 4 mmol/L, repeat above up to 3 times.
  - If this has been repeated 3 times, consider IV 10% glucose at 100 ml/hr

Blood glucose level should now be above 4mmol/L.

- Give 20g of long acting carbohydrate e.g. 2 biscuits or a slice of bread or next meal if due.
  - If IM Glucagon has been used give 40g of long acting carbohydrate in order to replenish glycogen stores.

For enteral feeding patients ONLY: give 200mls milk (not soya) or restart feed or give IV 10% glucose at 100ml/hr

Blood glucose should now be above 4mmol/L.

- Follow up treatment as described on the left.
- If NBM start 10% glucose infusion at 100ml/hr until no longer NBM or reviewed by doctor

**DO NOT OMIT SUBSEQUENT DOSES OF INSULIN**

CONTINUE REGULAR BLOOD GLUCOSE MONITORING FOUR TIMES A DAY FOR 48 HOURS OR UNTIL STABLE

GIVE HYPOGLYCAEMIA EDUCATION OR REFER TO DIABETES SPECIALIST NURSE FOR ADVICE - Bleep 6502 UHW, Bleep 6503 UHL

CONSIDER POSSIBLE CAUSE FOR HYPOGLYCAEMIA AND SEEK TO PREVENT FURTHER EPISODES FROM OCCURRING
Access through DUK or ABCD websites (via your search engine)

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