Appendix 4
Algorithm for the Management of Diabetic Ketoacidosis

Clinical History
- polyuria
- polydipsia
- weight loss
- abdominal pain
- weakness
- vomiting
- confusion

Clinical Signs
- assess dehydration
- deep sighing respiration (Kussmaul)
- smell of ketones
- lethargy, drowsiness

Biochemistry
- elevated blood glucose (>11mmol/l)
- acidaemia (pH<7.3)
- ketones in blood >3mmol/L
- take blood also for electrolytes, urea
- perform other investigations if indicated

Confirm Diagnosis
Diabetic Ketoacidosis
Call Senior Staff

pH <7.3 = Mild DKA (5% dehydration)
pH <7.2 = Mod DKA (7% dehydration)
pH <7.1 = Severe DKA (10% dehydration)

Resuscitation
- Airway + N/G tube
- Breathing (100% O2)
- Circulation (20ml/kg 0.9% sodium chloride. Repeated 10ml/kg boluses until circulation restored, max 40 ml/kg dose before discussion with senior doctor)

Intravenous therapy
- Give 10ml/kg fluid bolus over 60 mins (UNLESS HAS ALREADY HAD BOLUS FOR SHOCK)
- calculate fluid requirements - correct deficit over 48 hours
- use 0.9% sodium chloride with 20 mmol KCl in every 500 ml (check serum potassium normal and ensure urine output first)
- insulin 0.05 or 0.1units/kg/hour by infusion 1-2 hours after starting IV fluids

Observations
- hourly blood glucose
- neurological status at least hourly
- hourly fluid input/output
- electrolytes 2 hours after start of IV-therapy, then 4-hourly
- 1-2 hourly blood ketone levels

When blood glucose < 14 mmol/L

Intravenous therapy
1. Once blood glucose <14mmol add
   - add 5% glucose to 0.9% sodium chloride with 20 mmol KCl per 500 ml. Reduce insulin infusion to 0.05 units/kg/hr
2. If continuing with 0.1 units/kg/hr
   - add 10% glucose to 0.9% sodium chloride with 20 mmol KCl per 500 ml

Insulin
- start subcutaneous insulin then stop intravenous insulin 1 hour later

Resolution of DKA
- clinically well, drinking well, tolerating food
- blood ketones < 1.0 mmol/l or pH normal
- urine ketones may still be positive

Shock
Reduced peripheral pulse volume
Reduced conscious level, coma

No improvement (eg pH static /no reduction in ketones/BG)
Re-evaluate
- fluid balance + IV-therapy
- if continued acidosis, may require further resuscitation fluid
- check insulin dose correct and running properly
- consider sepsis
- consider restarting protocol

If blood glucose < 6 mmol/L

Exclude hypoglycaemia
Is it cerebral oedema?

Management
- give 5 ml/kg 2.7% sodium chloride or mannitol 0.5 - 1.0 g/kg
- dose may be repeated if needed
- call senior staff
- restrict I.V. fluids by 1/2
- discuss further care with paediatric critical care specialist

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