Diabetic Ketoacidosis (DKA) Care Guidelines Emergency Department Management

Inclusion Criteria (Definition of DKA):
- Blood glucose (BG) > 200 mg/dl
- Acidosis (bicarbonate < 15 or blood gas pH < 7.3)
- Associated glycosuria, ketonuria & ketonemia

Requires Critical Care level of care

Initial Evaluation
Assessment: VS, weight, severity of dehydration, level of consciousness, acute trigger for DKA e.g. infection, trauma, failure to take insulin, pump failure
Laboratory: stat bedside BG, Panel 9, phosphorous, magnesium venous pH, pCO2, pO2, CBC, UA, appropriate cultures if infection suspected

If patient is delayed being assigned an inpatient bed more than 2 hours consider utilizing DKA Guidelines-Critical Care

Recommendations/Considerations
- The severity of DKA is defined by the degree of acidosis: mild – pH 7.2 – 7.3; moderate – pH 7.1 – 7.2; severe pH < 7.1
- Goal decrease in glucose no more than 100 mg/dl per hour
- If glucose decreases rapidly this may increase the risk of cerebral edema
- Monitor Na level correction to ensure NA rises as glucose decreases using calculation of corrected Na level

Severity of dehydration:
- 5% - reduced skin turgor, dry mucous membranes, tachycardia
- 10% - capillary refill ≥ 3 seconds, sunken eyes
- >10% - weak or impalpable peripheral pulses, hypotension, shock, oliguria

Calculations:
- Anion gap = Na – (Cl+HCO3); normal is 12 ± 2 mmol/l
- Corrected sodium = measured Na + 1.6 X [(glucose mg/dl – 100) / 100]
- DKA at diagnosis is more common in children < 5 yrs of age
- Omission of insulin is the leading cause of recurrent DKA in adolescents

Causes of Morbidity and Mortality:
- Cerebral edema, which occurs in 0.5 – 1% of all episodes of DKA, is the most common cause of mortality in children with DKA, Cerebral edema usually develops 4 – 12 hours into treatment, but it can occur at any time
- Hypokalemia
- Na Bicarb should not be given without discussion with two attending physicians as this increases the risk of cerebral edema.
- For insulin drip, tubing must be manually primed.

Correction of Dehydration
- Estimate fluid deficit
- Subtract initial bolus received
- Divide remaining deficit over 48 hours
- Add deficit replacement/hour to normal maintenance/hr = Total fluid rate per hour
- Re-evaluate I/O for excessive ongoing urine loss
- Do not bolus > 40 mL/kg in 4 hours unless hypotensive or has significantly compromised perfusion

Cerebral Edema Treatment
- Give mannitol 0.25-0.5 gm/kg may be repeated X 1 for a total max of 50 gm
- Ensure adequate circulation but if possible reduce fluid rate by one third
- Avoid maneuvers and drugs likely to increase intracranial pressure
- If intubation is necessary consider neurosurgery consult for intracranial pressure monitoring
- Treat suspected cerebral edema based on clinical criteria immediately. Do not delay treatment to obtain confirmatory CT scan.

Reassess the appropriateness of Care Guidelines as condition changes. This guideline is a tool to aid clinical decision making. It is not a standard of care. The provider should deviate from the guideline when clinical judgment so indicates

Approved Evidence Based Medicine Committee 5-17-17

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References
Diabetic Ketoacidosis Care Guideline for Emergency Department


5-18-16; Reviewed 5-17-17