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Questions 1-3

An 8-year-old, previously healthy girl is brought in for evaluation of altered mental status. She is lethargic but is protecting her airway. She has a blood pressure of 80/40, a heart rate of 160, and respiratory rate is 50 and hyperpneic. Her electrolytes reveal a sodium of 132, a potassium of 4.8, chloride of 86, CO₂ of 6 BUN 30, Cr 1.1, and a glucose of 660. Her pH is 7.06 with a PCO₂ of 21 and a HCO₃ of 6. Her base deficit is -22. Her urine has 4+ ketones.

1. Appropriate initial therapy for this patient includes:
 - a. Initiation of fluid therapy with half-normal saline at maintenance rate.
 - b. Simultaneous subcutaneous insulin injection and intravenous insulin infusion.
 - c. Normal saline bolus, followed by half-normal saline with potassium at a maintenance rate.
 - d. Endotracheal intubation with hyperventilation.
2. After three hours of insulin (0.1 units/kg/hr) and fluid therapy (half-normal saline with 10mEq KCl/liter + 10mEq KPO₄/liter at 1.5x maintenance rate), her sugar is 250, her venous pH is 7.28, with a HCO₃ of 13. She is more awake. The next step with regard to her fluid and insulin management should be:
 - a. Stop intravenous fluids and insulin and have patient start oral fluids and subcutaneous insulin.
 - b. Stop the insulin infusion and continue with the current maintenance fluids.
 - c. Stop the insulin infusion and change to maintenance fluids containing dextrose and potassium.
 - d. Continue the insulin infusion and change to maintenance fluids containing dextrose and potassium.
3. This patient start to complain of a headache, and shortly thereafter becomes unresponsive. She has a fixed right pupil. Which of the following statements are FALSE:
 - a. This complication is seen more in children than in adults
 - b. This patients needs an immediate CT scan, followed by mannitol therapy if there are abnormalities on the CT
 - c. Risk factors associated with this complication include high BUN, low partial pressures of arterial carbon dioxide, and treatment with bicarbonate
 - d. This is the leading cause of death from diabetes in children
4. A 15-month-old boy is brought in to the ED by his parents after they had a hard time awakening him in the morning. He had been acting well the evening before, but because the family had brussel sprouts and liver for dinner, the patient skipped most of his meal. His bedside glucose is 28. All of the following are true EXCEPT:
 - a. Children are susceptible to hypoglycemia because their basal metabolic demands are higher those in adults, they have small glycogen stores, and have fewer precursors available for gluconeogenesis
 - b. The most common cause of hypoglycemia in children is idiopathic ketotic hypoglycemia
 - c. This patient should be treated immediately with 1-2 cc/kg D₅₀W

- d. Glucagon is less effective in children than in adults
5. A 17-day-old boy presents with lethargy and vomiting. He has not been eating well for several days. He appears dehydrated. His electrolytes reveal a sodium of 124, a potassium of 7.4, a CO₂ of 16, and a glucose of 88. All of the following are true EXCEPT:
- a. Mineralocorticoid replacement needs to occur immediately
 - b. When possible, serum should be drawn for testing PRIOR to the administration of any medications
 - c. The acute salt-wasting crisis associated with the most common form of this disorder occurs frequently in the first month of life
 - d. The most common form of this disorder causes females to be born with ambiguous genitalia
6. An otherwise healthy 16-year-old girl presents with lower abdominal pain, which has been ongoing for two days. She states that this pain occurs monthly. She reports she has never had a period and has never been sexually active. Her examination is notable for normal adult breast development and pubic hair distribution, as well as a suprapubic abdominal mass. Which of the following statements is TRUE:
- a. This patient's menstrual history, as well as her breast and pubic hair development, is within normal limits and is likely unrelated to her current chief complaint
 - b. A pregnancy test is unnecessary because teenagers rarely lie about their sexual history
 - c. An abdominal mass and amenorrhea in a teenager is worrisome for an ovarian tumor, as these are common malignant tumors in girls
 - d. This patient's pubertal development is abnormal, and in conjunction with her history and physical, suggests her diagnosis
7. A 3-year-old boy with a fever and altered mental status had bacterial meningitis diagnosed after a lumbar puncture in the ED and has been started on appropriate antibiotics. His serum sodium is 118 mEq/l. While awaiting the pediatric transport team, this child has a seizure. All of the following statements are true EXCEPT:
- a. This patient should be fluid restricted.
 - b. Hypertonic saline should be rapidly administered until the serum sodium is corrected to the normal range.
 - c. This patient's urine osmolality will be inappropriately elevated.
 - d. Patients with this condition do not appear clinically dehydrated.
8. A 20-month-old boy presents to the ED after a seizure. Although he is awake, alert, and non-toxic appearing now, his physical examination is notable for an overall appearance of malnutrition, as well as multiple nodules over the anterior part of his chest and tenderness over his wrists. The treatment for the MOST likely cause of his seizures is:
- a. Oral dietary supplementation
 - b. Immediate removal from the home environment pending Child Protective Services evaluation
 - c. Neurosurgical removal of intracranial lesions
 - d. Lumbar puncture and antibiotics
9. Which of the following statements about thyroid disease is FALSE:
- a. Most neonates with congenital hypothyroidism have subtle clinical signs.
 - b. The incidence of hyperthyroidism in children peaks in teenagers.
 - c. There are no identifiable risk factors for neonates who will develop neonatal thyrotoxicosis.
 - d. Treatment of thyroid storm includes beta-blockers, antithyroid medications followed by iodine, glucocorticoids and control of hyperthermia.

10. A 5-day-old boy is brought in by his parents because of a white discharge from both of his nipples. He was a full-term infant, and mom had an uncomplicated pregnancy and delivery. He has been otherwise well. He is afebrile and has no masses, warmth or tenderness surrounding his nipples. This drainage is most suggestive of:
- a. Neonatal mastitis
 - b. CNS tumor
 - c. Breast cancer
 - d. Normal newborn physiology