First 2010
VIVA 5

This Viva will examine knowledge of intravenous fluids, colligative properties What is in a bag of Normal Saline?

Areas of knowledge that candidates were tested on included concepts of osmolality, osmolarity, anion gap, mannitol, and colligative properties of fluid. In addition this viva tested knowledge of the pituatary gland, specifically anatomy, hormones secreted and in particular, Anti Diuretic Hormone.

"What is in a bag of Normal Saline?"

Normal saline contains 9g of Na-Cl per litre
This is equivalent to 150mOsmol/L Sodium and 150mOsmol/L Chloride

"What is osmolality"

Is the amount of solute in Osmols per kg and is independent of temperature

"What is osmolarity?"

is the amount of solute in Osmols per litre and is dependent on temperature

"What is osmotic pressure, what is the value of the normal osmotic pressure in plasma and how can it be measured"

Osmotic pressure is the pressure required to prevent movement of solvent molecules by osmosis across a semi permiable membrane. It is calculated by the ideal gas law (van Hofts) and for plasma is 5500mmHg. It is measured by the colligative properties of a solution which are those dependent on the number of molecules such as vapour and freezing point depression.

"What is tonicity?"

this is the effective osmotic pressure

"Calculate the anion gap of the following blood sample Na 140 Cl 105 HCO3 24 K 3.5"

the anion gap is the difference between the cations and anions, and equals 14.5
normal range is 8-16
increased anion gap in the setting of a metabolic acidosis assists with diagnosis

What are the causes of an increased anion gap acidosis?"

lactic acidosis, ketoacidosis, ingested acid (methanol), renal failure

"What are the causes of an normal anion gap acidosis?"

renal tubular acidosis, hyperchloraemic acidosis, diarrhoea

"What is secreted from the anterior and posterior pituitary?"

anterior- LH, GH, FSH, ACTH, Prolactin, TSH posterior - oxytocin, ADH/Vasopressin

"What receptors do vasopressin act on?"

V1a and b are G_qPCR which are found on platelets and smooth muscle and the liver
V2 are G_sPCR in the cortical collecting duct to insert aqua porins into the apical mem brane of principle cells

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