First 2010
VIVA 6

This Viva will examine liver physiology and diuretics.

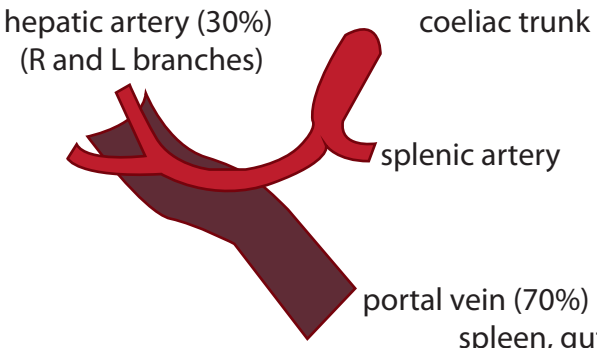
During this Viva candidates were asked about the functions of the liver, liver drug metabolism, blood supply and the physiological consequences of cirrhosis upon liver blood flow. Candidates were also asked about frusemide, frusemide associated biochemical disturbances

"What are the functions of the liver?"

carbohydrate metabolism
protien metabolism
lipid metabolism
immunological and filtration functions
storage - blood, iron, copper, vitamins and glycogen
bile production and bilirubin metabolism
EPO, renin, coagulation factor production
drug and hormone metabolism - phase 1 and 2 reactions
endocrine functions - vitamin D activation, thyroxine conversion

"Please describe the blood supply to the liver"

extensive anastamoses
- Hepatic
  - high pressure/flow
  - sats 98%
  - pulsitile
- Portal
  - low pressure/resistance
  - sats 85% (fasting)
  - non pulsitile, valveless
  - high protien content



"What percentage of blood flow passes through the liver?"

total blood flow is 1500ml (25% of CO)
has a capacitance function, storing 450mL of blood which is utilised during hypovolaemia
consists of 30% hepatic artery supply and 70% portal vein supply
both contribute to oxygenation (hepatic artery 50%, portal vein 50%)
the liver demonstrates variable oxygen extraction to adapt to changes in portal vein oxygenation

"What are the physiological consequences of cirrhosis"

impaired function of the liver secondary to replacement of parenchymal tissue with connective tissue
- this leads to impaired carbohydrate, lipi and protien metabolism
- immunological impairment, decreased blood filtration (increasing risk of SBP)
- impaired bilirubin metabolism and bile formation leading to jaundice and malabsorption
- decreased EPO production, anaemia and clotting abnormalities
- reduced drug and toxin metabolism
- endocrine abnormalities such as decreased vitamin D activation and calcium dysregulation

there is often an associated increase in portal pressures and portal hypertension
- this is associated with a decrease in SVR, and increase in CO leading to a hyperdynamic CVS
- this also leads to pathological consequences such as oesophageal varices, ascities etc.

"What electrolyte distrubances are associated with frusemide?"

Frusemide is a loop diuretic, it is action is via blocking Na.K.2CL carrier in the TAL, it is highly protien bound and is secreted into the tubules rather than filtered at the glomerulus.
Electroltye abnormailites are due to increased K loss or dilution of Na secondary to hypovolaemia and increased ADH secretion