

Second 2008
VIVA 6

This viva will mostly cover pharmacology and physiology of insulin. Describe the primary function of insulin.

This viva explored the candidates' knowledge in relation to the following points
Structure, mechanism of action and physiology of natural insulin, Insulin preparations
Pathophysiology of re-feeding syndrome

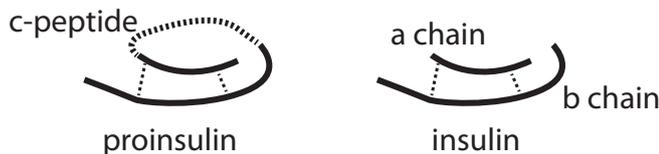
Examination feedback: Candidates knowledge in relation to the physiology of insulin was good and much stronger than their knowledge in relation to the pharmacology of the different insulin preparations. It is important that candidates have a good understanding of the pharmacology of insulin preparations as well as remain up to date with changes in those preparations. Candidates also struggled with describing the basic elements, in particular the changes to electrolytes, associated with the re-feeding syndrome.

“Describe the primary function of insulin”

facilitate the uptake of glucose into cells which provides the main energy substrate for cellular activity
it is the main anabolic hormone throughout the body
it increases the storage of glucose, fatty acids and amino acids
with glucagon it is the main regulator of glucose homeostasis

“What is the structure of insulin”

it is secreted from the beta cells of the endocrine pancreas
it is formed from proinsulin which loses the c-peptide resulting in the double chain insulin molecule



“describe the pharmacology of different insulin preparations”

human insulin preparations which have a short onset of action and analogues
insulin analogue preparations vary according to their speed of onset and duration of action
variability is due to structural modifications which modify time taken to hexamer or polymer formation
onset may be as rapid as five minutes, and up to 2 hours with long acting preparations
duration can vary from 2 to 24 hours

“what is refeeding syndrome?”

phosphate stores are depleted during a period of starvation
when carbohydrates are given insulin is released and anabolic pathways activated
this requires increased amounts of phosphate (and K and Mg) resulting in profound depletion
inability to produce ATP leads to tissue hypoxia, myocardial dysfunction and resp failure

“what electrolyte changes would you expect in refeeding syndrome?”

hypophosphataemia
hypomagnesaemia
hypokalaemia
fluid overload and oedema
vitamin and trace mineral deficiency