

Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

CHEMISTRY LEGEND

NOVEMBER 2009

HYPOGLYCAEMIA

Hypoglycaemia can either be biochemical or clinical and either can occur without evidence of the other, though often both can occur together. Biochemical hypoglycaemia is defined as a blood glucose level lower than 2.2 mmol/l and it may occur without clinical manifestations. However, the levels found in fasting adults are slightly higher than 2.2 mmol/l.

Length of fast		10-16 hrs	72 hrs
Plasma glucose:	Male	3.5 mmol/l	3.0 mmol/l
	Female	3.5 mmol/l	2.5 mmol/l

Plasma glucose less than these are considered hypoglycaemia. In children a short fast (4-12 hours) can result in levels less than 2.5 mmol/l. In the neonate fasting levels of around 1.5 mmol/l may be obtained.

The symptoms and signs of clinical hypoglycaemia can be divided into two groups: acute and chronic.

- Acute: these mainly reflect stress effects and include anxiety, hunger, faintness, sweating, headache, loss of consciousness, convulsions (children)
- Chronic: these occur if the condition has been present for some time - loss of intellectual function, psychotic symptoms, abnormal behaviour

A definitive diagnosis of hypoglycaemia should involve all the following:

- Symptoms and signs of hypoglycaemia
- Low plasma glucose (< 2.2 mmol/l)
- Relief of symptoms with glucose (oral/infusion)
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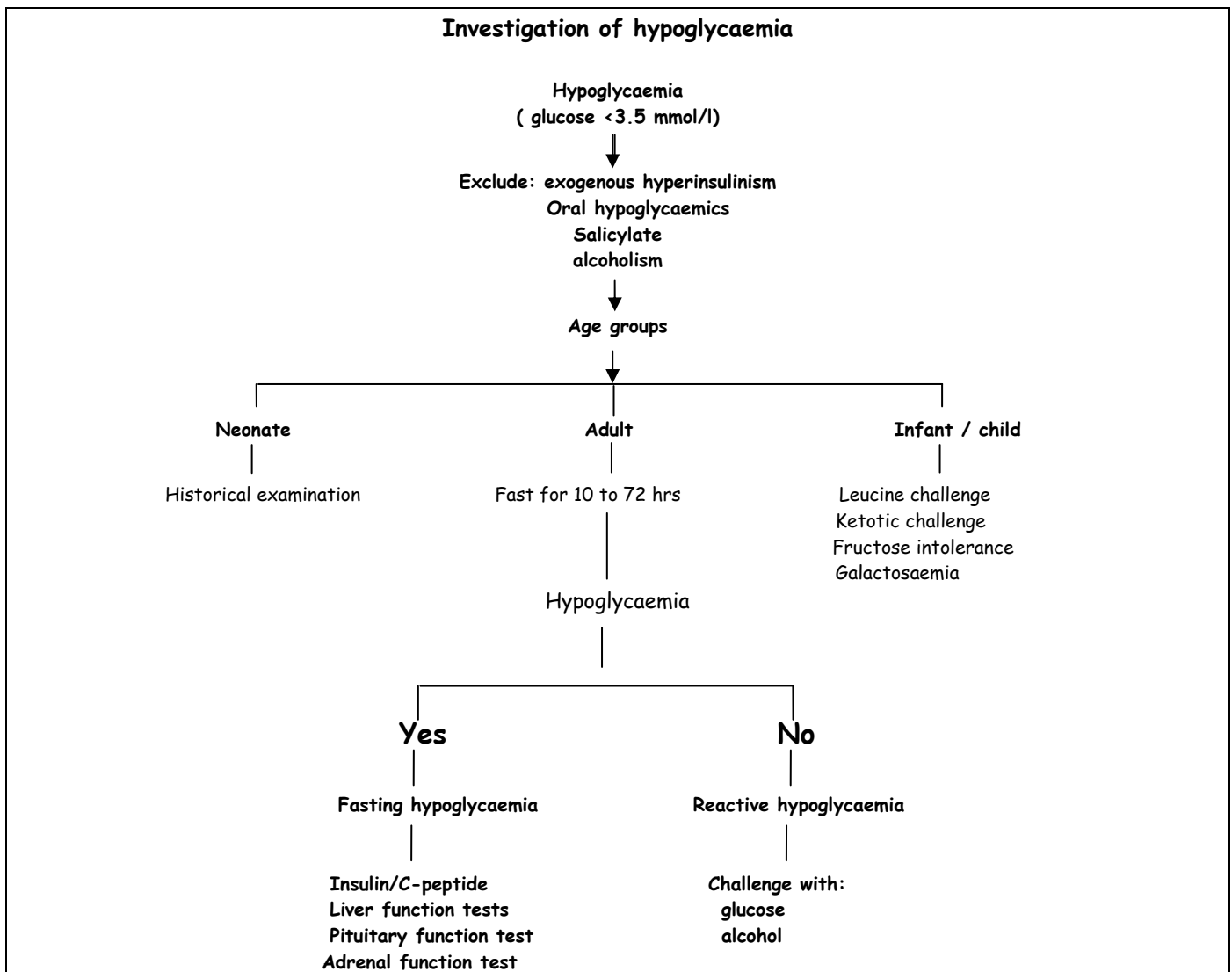
Causes of hypoglycaemia

- **Drug induced:** insulin, oral hypoglycaemics, salicylates, alcohol
- **Fasting:** insulinoma, multiple endocrine neoplasia, endocrine disease, hypopituitarism, hypoadrenalism, liver disease, severe glycogen storage disease, extra-pancreatic tumours (hepatoma, adrenal carcinoma, retroperitoneal fibroma)
- **Reactive:** glucose - functional, post gastrectomy, early diabetes mellitus, alcohol
- **Infants and children:** leucine sensitivity, ketotic hypoglycaemia, galactosaemia, glycogen storage disease, hereditary fructose intolerance, adult causes (above), idiopathic hypoglycaemia
- **Neonates:** transient, prematurity, small-for-dates-babe, baby of diabetic mother, baby of toxæmic mother, perinatal anoxia, cold stress, respiratory stress, Rh-incompatibility, infant causes above

Having decided that a patient has "true" hypoglycaemia (clinical and biochemical) the first action is to classify them into age groups and then to further divide them into "fasting", "reactive", etc processes which require a high degree of clinical acumen and suspicion.

Keep in mind that the most common cause of hypoglycaemia is drug therapy, if this is excluded then functional hypoglycaemia, diabetes mellitus and insulinoma should be considered in that order.

Useful laboratory tests for the investigation and diagnosis of hypoglycaemia include GTT, prolonged fasting glucose, plasma insulin, C-peptide and drug screen.



References

1. Cases in chemical pathology - A Diagnostic approach 4th edition

Questions

1. Differentiate between biochemical and clinical hypoglycaemia.
2. What are the causes of hypoglycaemia?
3. How would you investigate a patient suspected of being hypoglycaemic?