Guide to insulin testing for the investigation of hypoglycaemia for hospitals referring samples to MFT

Test ordering

Order insulin, glucose, C-peptide and other hypo screen tests as required. Ensure reason for request is clear to local laboratory.

Is administration of exogenous insulin suspected?

Yes

No

Discuss with local laboratory

More appropriate to send to sample to Guildford laboratory for analysis by an immunoassay which detects all forms of insulin*.

Sample collection

When POCT glucose is <2.7 mmol/L, collect samples for insulin, C-peptide, glucose and other hypo screen tests as required, prior to correcting hypoglycaemia. Take care to avoid haemolysis. Send to local laboratory as soon as possible. Plasma/ serum must be separated and frozen within 4 hours of collection.

Transport sample to MFT

Referring laboratory to transport frozen sample to MFT. The referring laboratory should provide the reason for request and laboratory glucose result for a sample collected at the same time as the insulin (either electronically or on paperwork sent with the sample).

Urgent Analysis

If laboratory glucose <3.0 mmol/L and the insulin result is required urgently for patient management, call local laboratory to discuss. Referring laboratory to discuss with MFT laboratory on 0161 7012265. Urgent analysis at MFT is usually possible within 2 working days of sample receipt (often next working day).

Communication of "red flag" results

A red flag result is an unexpected combination of hypoglycaemia, elevated insulin and low C-peptide. An MFT Clinical Scientist will contact the referring laboratory to discuss the result (Duty Biochemist/ Consultant Clinical Scientist), if the clinical details provided do not indicate that the patient is known to be on insulin. The referring laboratory should discuss the results with the clinical team. If there is no electronic transfer of results, the referring laboratory should ensure that the results are added to the LIMS within two hours of being contacted by the referral laboratory.

Depending on the circumstances, further testing may be indicated. If the results are unexpected, the residual sample volume will be assessed. If sufficient volume, the insulin and C-peptide tests will be repeated to check for analytical errors. The sample may be forwarded to Guildford laboratory for testing by their immunoassay which has a wider specificity. In certain scenarios, mass spectrometry analysis—available in a specialised laboratory in Germany—is indicated to definitively confirm and identify the specific type(s) of insulin present.

***Consider collecting an additional sample for MFT analysis of insulin and C-peptide. This result will be likely be available more quickly and many exogenous insulins are also detectable in the MFT assay.**

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