Diabetic by oral glucose tolerance test but normal by haemoglobin A_{1c}

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Aims

a) to explore the efficacy and implications of haemoglobin A_{1c} (HbA_{1c}) use in the diagnosis of type 2 diabetes mellitus (DM)
b) to assess the impact of employing HbA_{1c}, with reference to the 75 g oral glucose tolerance test (OGTT)
c) to investigate the potential influence of patient age on diagnostic efficacy as well as the ability of HbA_{1c} to detect prediabetes (impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT)).

Methods

The HbA_{1c} assay has been approved by the World Health Organization (WHO) for use in the diagnosis of type 2 DM. The agreement between OGTT and HbA_{1c}–based WHO criteria in the diagnosis of normal glucose tolerance, prediabetes, or diabetes is investigated. HbA_{1c} analysis was performed in 232 subjects undergoing the OGTT. Patients were categorised based on the WHO (1999) OGTT criteria. Receiver operating characteristic (ROC) curve analysis was used to determine the associated diagnostic sensitivity, specificity and optimal cut-off values for HbA_{1c}.

Results

At 48 mmol/mol HbA_{1c} had a sensitivity of 73.6% and specificity of 87.2% in detecting diabetes diagnosed by either fasting plasma glucose and/or 2-hour glucose. The lowest efficacy was seen in subjects diagnosed by the 2-hour glucose or those above 70 years of age. HbA_{1c} demonstrated a moderate ability to detect impaired fasting glycaemia (IFG), but could not accurately detect impaired glucose tolerance.

Conclusion

There is a need to explore the efficacy and implications of HbA_{1c} use in the diagnosis of type 2 DM and in the detection of prediabetes. HbA_{1c} did not identify all patients with diabetes or prediabetes that the OGTT detected, notably missing considerable numbers of patients diagnosed by a 2-hour glucose concentration. Based on OGTT performance, elderly patients may require a lower HbA1c cut-off in order to enhance diagnostic efficacy, however, this requires further study. ■

Conflict of interest statement

No conflict of interest declared.

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