

HbA1c as a diagnostic criterion: comparison to oral glucose tolerance testing (OGTT) in 1035 adults from the UAE

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Introduction: Recent guidelines include a glycosylated haemoglobin of $\geq 6.5\%$ as a criterion for diagnosing diabetes mellitus. We have investigated the applicability of this cut-off for diagnosing diabetes in the UAE population.

Methods: Subject recruitment was through a public health campaign. Patients with previously known diabetes were excluded. All subjects (n=1035 self-presenting adults) underwent a 75g oral glucose tolerance and HbA1c (HPLC method, Variant II, BioRad laboratories, CA) testing. Accuracy of HbA1c cut-off was analysed using receiver operating characteristic (ROC) curves.

Results: Diagnoses of diabetes mellitus (DM), Impaired fasting glycaemia (IFG), Impaired glucose tolerance (IGT), IFG+IGT, and Normal glucose tolerance (NGT) were made on 21.9%, 15.4%, 8.8%, 10.4% and 43.5% of subjects respectively. Fasting plasma glucose (FPG) of ≥ 7.0 mmol/l alone had a sensitivity of 71.8% for diagnosing DM. There was a spectrum of HbA1c values in the patients, with varying specificities and sensitivities in relation to diagnosis of DM based on OGTT.

HbA1c cut-off values for diagnosis of DM	$\geq 6\%$	$\geq 6.1\%$	$\geq 6.2\%$	$\geq 6.3\%$	$\geq 6.4\%$	$\geq 6.5\%$	$\geq 7\%$
Sensitivity	0.91	0.88	0.85	0.81	0.78	0.73	0.56
Specificity	0.79	0.84	0.88	0.92	0.94	0.95	0.99

Table 1. Sensitivity and Specificity of various HbA1c values in the diagnosis of DM based on OGTT.

In the study population, HbA1c cut-offs of 6.2% and 6.3% had the highest summation of sensitivity and specificity for diagnosing DM. Used alone, a cut-off HbA1c of $\geq 6.5\%$ gave a sensitivity of 73% and specificity of 95%. An FPG cut-off of ≥ 7.0 mmol/l and/or an HbA1c cut-off value of $\geq 6.5\%$ used together increased the sensitivity 82.8%.

Conclusion: In the population studied, using FPG alone resulted in 28% of patients with diabetes being missed. With the new diagnostic HbA1c cut-off value of 6.5%, the data presented shows that the sensitivity of using HbA1c for diagnosis is significantly improved when FPG is also added.