

DIABETES

HbA_{1c}-based diagnosis of diabetes mellitus: ethnic disparities in prevalence effects

The proposed shift from the use of the oral glucose tolerance test (OGTT) to HbA_{1c} level to diagnose diabetes mellitus will have differential effects on the prevalence of this disease across ethnic groups, report an international group of researchers.

“The report by Christensen *et al.* raises serious concerns regarding the sensitivity of HbA_{1c} $\geq 6.5\%$ as a universal method for diagnosing diabetes mellitus across the world,” cautions Sam Dagogo-Jack of the University of Tennessee Health Science Center, USA.

In 2009, an International Expert Committee recommended a move to the use of HbA_{1c} level to diagnose diabetes mellitus, and in 2010 the American Diabetes Association adopted the recommendation. Advantages of HbA_{1c} level over OGTT include the fact that it measures chronic rather than acute dysglycemia and is more convenient because patients do not need to fast. However, different ethnic groups produce different HbA_{1c} levels at similar blood glucose levels.

“In our paper, the impact of changing the diagnostic criteria was examined by answering two clinically relevant questions,” explains lead researcher Dorte Vistisen of the Steno Diabetes Center,

Denmark. “Firstly, how is the prevalence of diabetes mellitus affected and, secondly, are we diagnosing the same people with the new criteria?”

The investigators compared the prevalence of diabetes mellitus as defined by HbA_{1c} and OGTT criteria by analyzing data from six studies that included participants from Denmark, the UK, Australia, Greenland, Kenya and India. For the main analysis, ethnicity was kept uniform within each population; for example, the population from Greenland included only Inuit participants. A total of 23,094 participants were included in the analysis, but the Kenyan population was small (296 individuals). Study participants were placed in four subgroups on the basis of their OGTT results (diabetes mellitus or no diabetes mellitus) and HbA_{1c} levels ($<6.5\%$ or $\geq 6.5\%$).

The shift to HbA_{1c}-based criteria will result in increased prevalence of diabetes mellitus in some populations but decreased prevalence in others, according to the findings. For example, prevalence was 63% increased by use of the HbA_{1c} definition in the Danish study but 82% decreased in the Australian study. The probability of an HbA_{1c} level $\geq 6.5\%$ in cases of OGTT-diagnosed diabetes mellitus varied widely by study center (from 17% in Australia to

78% in India). More importantly, perhaps, the diagnostic agreement between the two approaches in the reverse direction—the probability of an individuals with HbA_{1c}-defined diabetes mellitus also meeting OGTT criteria of diabetes mellitus—was highly variable, being very high for Australia (98.1%) or the UK (91.3%) but low for Denmark (27%), Kenya (50%), Greenland (53.3%) and India (61.9%).

The researchers concede that their finding might, in part, result from methodological differences between the studies; however, the results still suggest to Vistisen that “the low degree of overlap between the two definitions of diabetes mellitus means that if we change the diagnostic criteria, we will be diagnosing and therefore treating a very different group of patients.”

The next step, Vistisen says, is to investigate which individuals will be diagnosed as having diabetes mellitus with the HbA_{1c}-based criteria who were not diagnosed as having diabetes mellitus by the OGTT to see if this group of individuals are at a similar or higher risk of developing microvascular and macrovascular disease.

In the meantime, Dagogo-Jack urges a cautious approach to the use of the new criteria. “What is needed is a more rigorous evaluation of the relationship between HbA_{1c} and recent antecedent glycemic burden over the preceding 2–3 months among a large cross-section of individuals from the major ethnic/racial groups of the world. Until such studies provide reassurance and caveats, it will be advisable for clinicians to confirm the diagnosis of diabetes mellitus with actual blood glucose values, especially in persons from African, Asian and other non-European ancestry.”

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Original article Christensen, D. L. *et al.* Moving to an A1C-based diagnosis of diabetes has a different impact on prevalence in different ethnic groups. *Diabetes Care* 33, 580–582 (2010)

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