Unseen and Undiagnosed: Diagnostic Accuracy of HbA1c for Screening for Diabetes in Africa

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Glycated haemoglobin (HbA1c) is widely used as a diagnostic tool because it captures long-term glycemic control and is easy to use. However, its diagnostic accuracy relative to the fasting plasma glucose (FPG) and the oral glucose tolerance test (OGTT) remains uncertain, particularly in African populations. To evaluate the diagnostic accuracy of HbA1c compared with FPG among African adults without previously diagnosed type 2 diabetes, we conducted a systematic review and meta-analysis. Following the screening of 1356 studies, 32 met the inclusion criteria, and eight provided extractable data for the 2x2 meta-analysis. According to these studies, HbA1c demonstrated a pooled sensitivity of 60.0% and a specificity of 95.9%. Sensitivity showed moderate heterogeneity, while specificity showed high heterogeneity. Diagnostic odds ratio (DOR) ranged from 2.125 to 145.714, with a pooled DOR of 35.251 indicating that individuals with diabetes were about 35 times more likely to be correctly identified by HbA1c than those without diabetes. These findings suggest that HbA1c and FPG identify different metabolic phenotypes of type 2 diabetes, which help explain their limited agreement. Given that FPG is not a true gold standard, some of the apparent under-performance of the HbA1c likely reflect limitations of the FPG rather than a true diagnostic failure of the HbA1c itself. Relying on either test alone may therefore miss cases particularly in African populations. Using HbA1c and FPG together may improve diagnostic accuracy, and future research should prioritize direct comparisons with the OGTT and explore population specific diagnostic thresholds.