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Using Glycosylated Hemoglobin to Define the Metabolic Syndrome in United States Adults

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OBJECTIVE — To compare the use of GHb and fasting plasma glucose (FPG) to define the metabolic syndrome (MetS).

RESEARCH DESIGN AND METHODS — Data from the U.S. National Health and Nutrition Examination Survey 1999–2006 were used. MetS was defined using the consensus criteria in 2009. Raised blood glucose was defined as either FPG ≥100 mg/dl (5.6 mmol/l) or GHb ≥5.7%.

RESULTS — In 2003–2006, there was 91.3% agreement between GHb and FPG when either was used to define MetS. The agreement was good irrespective of age, sex, race/ethnicity, BMI, and diabetes status (≥87.4%). Similar results were found in 1999–2002. Among subjects without diabetes, only the use of GHb alone, but not FPG, resulted in significant association with cardiovascular diseases (odds ratio 1.45, P = 0.005).

CONCLUSIONS — Using GHb instead of FPG to define MetS is feasible. It also identifies individuals with increased cardiovascular risk.

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CONCLUSIONS — The controversy regarding the definition of MetS has been addressed recently in a joint scientific statement. GHb reflects the mean blood glucose level over several months and its measurement does not require a time-consuming sample. The components of MetS are independent and do not result in misclassification. This agreement was good irrespective of age, sex, and Hispanic origin. The difference in the prevalence of MetS, estimated by the non-DM group, was statistically significant for NHANES 1999–2002 compared with the use of FPG alone in both age groups: the use of GHb alone resulted in lower prevalence of MetS compared with the use of FPG alone. The use of GHb alone in the non-DM group was also examined. Similar results were found when the consensus criteria in 2009 were used to define MetS (supplementary Table A2). The use of both GHb and FPG alone in the non-DM group resulted in a lower prevalence compared with the use of GHb alone in the non-DM group. This is important for the management of cardiovascular risk and BMI.
data. It remains to be seen if our conclusions are also applicable to Asians, among whom the prevalence of raised blood glucose is likely to be different.

The current cut point of GHb identifies a slightly smaller group of people as having MetS. However, it also identifies subjects at high risk for cardiovascular diseases, even in those without diabetes, when the consensus criteria in 2009 are used to define MetS. Whether GHb results in better risk stratification needs to be investigated in large prospective studies.

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K.L.O. researched data, contributed to discussion, and wrote the manuscript. A.W.K.T. and K.S.L.L. contributed to discussion and reviewed/edited the manuscript. S.S.C. and P.C.S. contributed to discussion. B.M.Y.C. contributed to discussion, wrote the manuscript, and reviewed/editing the manuscript.

References