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Impact of HbA1c Criterion on the Detection of Subjects with Increased Risk for Diabetes among Health Check-Up Recipients in Korea (*Diabetes Metab J* 2012;36:151-6)

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Hemoglobin A1c (A1c) has been investigated as a target for treatment of diabetes. Work has been done toward the standardization of A1c measurement, and the standardized method for A1c testing produces data consistent with that of the international A1c-Derived Average Glucose (ADAG) trial and Diabetes Control and Complications Trial (DCCT) [1,2]. A1c measurement is a more convenient and reproducible method than fasting glucose, providing reliable information for chronic glycemic control for 2 to 3 months. A1c has been known to have a strong correlation with chronic complications of diabetes and mortality [3,4].

Based on this evidence, the American Diabetes Association (ADA) suggested revised criteria for the diagnosis of diabetes mellitus using A1c levels, the criteria for which was A1c ≥6.5% [5]. However, there has been some debate that the recent ADA criterion by A1c level was too high, and concern has been raised about the possible delay in detecting undiagnosed diabetes [6-8]. Furthermore, it is very important to determine the appropriate A1c cutoff value based on epidemiology data for people of different ethnic backgrounds for the diagnosis of diabetes throughout the world.

From our previous prospective Ansung-cohort study, 635 participants (6.8%) had previously undiagnosed diabetes at baseline. An A1c cutoff value of 5.8% produced the highest sensitivity (72%) and specificity (86%) for detecting undiagnosed diabetes by receiver operating characteristic curve analysis in our cohort. At 6 years, 895 (10.2%) had developed new-onset diabetes. The cutoff A1c of 5.8% was the most accurate for predicting 6-year incident diabetes. After multiple adjustments, both men and women with a baseline A1c of ≥5.8% had a more than 3-fold increase in the risk of new-onset diabetes compared with those with A1c <5.8% at baseline [8]. When we converted this value to a DCCT-aligned assay, a cutoff of ≥6.5% had only 52.3% sensitivity with 96.8% specificity. An A1c value of 6.2% as obtained from the converted value was best for detection of undiagnosed diabetes as defined by the oral glucose tolerance test criteria with 67.6% sensitivity and 90.7% specificity.

Kim et al. [9] concluded from an analysis of retrospective, routine health examination data (more than 35,000 recipients) that measurement of A1c alone could not detect undiagnosed diabetes properly in their study population (detection rate: 18.1% by A1c only vs. 31.8% by fasting blood glucose [FBS]). A diagnosis made with A1c and FBS together enhanced the accuracy of diagnosis up to 38.1%. In conclusion, A1c criteria alone identifies fewer subjects with increased risk of diabetes than does FBS criteria, and about 20% more cases could be detected by the addition of HbA1c criteria. This is an interesting and important result in terms of providing proper methods for diagnosis of diabetes in the Korean population, in spite of

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the retrospective data from routine health care of Kim et al. In addition, considering FBS and A1c together produced more accurate results for the detection of diabetes by reflecting both acute and chronic hyperglycemia. However, Kim et al. only mentioned that A1c was measured with high-performance liquid chromatography in their study. We wanted to know if the A1c value when converted to the the DCCT-aligned reference A1c in their study.

Furthermore, the cohort from Ansung prospective study will soon begin undergoing 10-year follow up visits. We will be able to analyze prospective cohort data and the health examination data together to provide the best cutoff value for A1c and the values for both A1c and FBS together for the detection of diabetes in Koreans.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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