Lowering the Criterion for Impaired Fasting Glucose Will Not Provide Clinical Benefit

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In 1997, the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus lowered the fasting criterion for diabetes from ≥140 (7.8 mmol/l) to ≥126 mg/dl (7.0 mmol/l) (1). This decision was made to allow the prevalence of diabetes diagnosed by fasting plasma glucose (FPG) concentrations to equal the prevalence of diabetes diagnosed by 2-h values on a glucose tolerance test. The fact that 60% of the new cohort of people with diabetes, i.e., those diagnosed by FPG concentrations of 126–139 mg/dl, would have normal A1C levels (2) did not seem to trouble the committee.

Using the same rationale of equalizing outcomes achieved by utilizing two different criteria, in last month's issue of *Diabetes Care* (3) the Expert Committee decreased the lower limit of normal for FPG concentrations. The definition of impaired fasting glucose (IFG) is now FPG concentrations from 100 (5.55 mmol/l) to 125 mg/dl (6.9 mmol/l). Although they may identify different individuals, the proportion of the population meeting the new definition of IFG will now be similar to the proportion with impaired glucose tolerance (IGT). Since the level of glycemia is not important for predicting cardiovascular disease if adjustments are made for other cardiovascular risk factors (4–6), the only role for a diagnosis of IFG or IGT is to predict future diabetes. Under the former definition, the sensitivity of IFG for predicting diabetes was less than that of IGT (7). It is anticipated that with the new definition of IFG, the sensitivities would be similar.

What would be the clinical benefit if this should turn out to be the case? It is difficult to see any. Almost all individuals with IFG will have other risk factors of the Insulin Resistance Syndrome, e.g., central obesity, hypertension, and dyslipidemia (8), and will require treatment for these regardless of their FPG concentration. The only possible benefit is that people diagnosed with IFG would be more likely to adopt the lifestyle interventions (diet and exercise) that are necessary to reduce the risk for developing diabetes in the future. However, there are certainly no data to suggest that this would happen and, given the difficulty of convincing patients with known diabetes to undergo such lifestyle changes, it seems very unlikely that this will occur in the larger number of individuals who are now told that they have IFG.

So what is to be gained by labeling a substantial proportion of our population with IFG? We evaluated the impact of changing the definition of IFG using the National Health and Nutrition Examination Survey (NHANES) 1999–2000 dataset (Table 1). IFG prevalence rises from 6.7 to 24.1%. Over 40% of people >65 years old will have it; >30% of those between the ages of 50 and 64 years will have it. The biggest change occurs among those between 20 and 50 years of age, with an almost fivefold increase in prevalent IFG. The majority of these individuals will not develop diabetes. What will we have accomplished? That's certainly not clear. Is there a down side? Potentially. Insurance companies could raise life insurance premiums or medical insurance premiums, or in a worst-case

Table 1—*Prevalence of IFG by demographic group for two definitions using the NHANES 1999–2000 dataset*

	IFG with 110 mg/dl cut point		IFG with 100 mg/dl cut point		
Demographics	*n*	%	*n*	%	Fold increase
Total (182 million)	12,160,000	6.7	43,760,000	24.1	2.6×
Male	7,151,000	8.1	25,690,000	29.2	2.6×
Female	5,008,000	5.3	18,060,000	19.2	2.6×
Mexican American	684,000	6.0	3,064,000	26.7	3.5×
Other Hispanic	1,472,000	8.8	5,160,000	30.9	2.5×
Non-Hispanic white	8,505,000	6.6	30,790,000	24.0	2.6×
Non-Hispanic black	1,110,000	5.7	3,219,000	17.3	2.0×
Other	388,000	5.7	1,518,000	22.3	2.9×
Age 20–49 years	3,611,000	3.1	20,160,000	17.3	4.6×
Age 50–64 years	3,740,000	9.9	11,660,000	30.9	2.1×
Age ≥65 years	4,808,000	17.5	11,930,000	43.5	1.5×

IFG excludes diagnosed diabetes regardless of measured FPG.

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Abbreviations: FPG, fasting plasma glucose; IFG, impaired fasting glucose; IGT, impaired glucose tolerance.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

scenario, consider IFG as a preexisting condition and either not pay for costs associated with subsequently developed diabetes or even deny enrollment. Employers could try to surreptitiously make it more difficult for those with IFG to secure employment (though it's technically illegal to discriminate). If any of these come to pass, then the new definition of IFG will have much more of a detrimental effect than a positive one. Hopefully this will not be the case and those who advocated this change (so that the predictive powers of IFG and IGT for future diabetes can now be similar) can feel vindicated, even if many of us do not foresee any clinical benefit.

References

1. The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus: Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. *Diabetes Care* 20:1183–1197, 1997
2. Davidson MB, Schriger DL, Peters AL, Lorber B: Relationship between fasting plasma glucose and glycosylated hemoglobin: potential for false-positive diagnoses of type 2 diabetes using new diagnostic criteria. *JAMA* 281:1203–1210, 1999
3. The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus: Follow-up report on the diagnosis and classification of diabetes mellitus. *Diabetes Care* 26:3160–3167, 2003
4. Stern MP, Fatehi P, Williams K, Haffner SM: Predicting cardiovascular disease: do we need the oral glucose tolerance test? *Diabetes Care* 25:1851–1856, 2002
5. Meigs JB, Nathan DM, D'Agostino RB, Wilson PWF: Fasting and post-challenge glycemia and cardiovascular risk: the Framingham Offspring Study. *Diabetes Care* 25:1845–1850, 2002
6. Alexander CM, Landsman PB, Teutsch SM: Diabetes mellitus, impaired fasting glucose, atherosclerotic risk factors, and prevalence of coronoary heart disease. *Am J Cardiol* 86:897–902, 2000
7. Unwin N, Shaw J, Zimmet P, Alberti KG: Impaired glucose tolerance and impaired fasting glycaemia: the current status on definition and intervention. *Diabet Med* 19:708–723, 2002
8. The Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults: Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III): *JAMA* 285:2486–2509, 2001