Validation of a Multimarker Model for Assessing Risk of Type 2 Diabetes from a Five-Year Prospective Study of 6784 Danish People (Inter99)

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Abstract

Background:

Improved identification of subjects at high risk for development of type 2 diabetes would allow preventive interventions to be targeted toward individuals most likely to benefit. In previous research, predictive biomarkers were identified and used to develop multivariate models to assess an individual's risk of developing diabetes. Here we describe the training and validation of the PreDx™ Diabetes Risk Score (DRS) model in a clinical laboratory setting using baseline serum samples from subjects in the Inter99 cohort, a population-based primary prevention study of cardiovascular disease.

Methods:

Among 6784 subjects free of diabetes at baseline, 215 subjects progressed to diabetes (converters) during five years of follow-up. A nested case-control study was performed using serum samples from 202 converters and 597 randomly selected nonconverters. Samples were randomly assigned to equally sized training and validation sets. Seven biomarkers were measured using assays developed for use in a clinical reference laboratory.

Results:

The PreDx DRS model performed better on the training set (area under the curve [AUC] = 0.837) than fasting plasma glucose alone (AUC = 0.779). When applied to the sequestered validation set, the PreDx DRS showed the same performance (AUC = 0.838), thus validating the model. This model had a better AUC than any other single measure from a fasting sample. Moreover, the model provided further risk stratification among high-risk subpopulations with impaired fasting glucose or metabolic syndrome.

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Abstract cont.

Conclusions:

The PreDx DRS provides the absolute risk of diabetes conversion in five years for subjects identified to be "at risk" using the clinical factors.

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