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SYMPOSIUM

Noninvasive Optical Screening for Diabetes

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Abstract

Background:

Advanced glycation end products (AGEs) are implicated in the complications of diabetes. Advanced glycation end products also accumulate in the skin and are sensitive biomarkers for the risk of developing diabetes and related complications. Some AGEs fluoresce and can be measured noninvasively by optical spectroscopy.

Methods:

Noninvasive screening for diabetes has been evaluated in an 18-site study involving a cohort of 2793 subjects meeting American Diabetes Association-based screening criteria. Subjects were measured with a specialized skin fluorimeter and also received traditional blood glucose and glycated hemoglobin tests.

Results:

Retrospective results indicated that the noninvasive technology measuring dermal fluorescence is more sensitive at detecting abnormal glucose tolerance than either fasting plasma glucose or glycated hemoglobin A1C.

Conclusions:

These results suggest that noninvasive measurement of dermal fluorescence may be an effective tool to identify individuals at risk for diabetes and its complications. The noninvasive technology yields immediate results, and since measuring dermal fluorescence requires no blood draws or patient fasting, the instrument may be well suited for opportunistic screening.

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Abbreviations: (A1C) glycated hemoglobin A1C, (AGE) advanced glycation end product, (AGT) abnormal glucose tolerance, (AUC) area under the curve, (FPG) fasting plasma glucose, (IF) intrinsic fluorescence, (IFG) impaired fasting glucose, (OGTT) oral glucose tolerance test, (ROC) receiver operator characteristic

Keywords: instrumentation, noninvasive, screening, skin fluorescence

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