

Simple Noninvasive Measurement of Skin Autofluorescence

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Accumulation of advanced glycation end products (AGEs) is thought to play a role in the pathogenesis of chronic complications of diabetes mellitus and renal failure. Several studies indicate that AGE accumulation in tissue may reflect the cumulative effect of hyperglycemia and oxidative stress over many years. Simple quantitation of AGE accumulation in tissue could provide a tool for assessing the risk of long-term complications. Because several AGEs exhibit autofluorescence, we developed a noninvasive autofluorescence reader (AFR). Skin autofluorescence measured with the AFR correlates with collagen-linked fluorescence and specific skin AGE levels from skin biopsy samples. Furthermore, skin autofluorescence correlates with long-term glycemic control and renal function, and preliminary results show correlations with the presence of long-term complications in diabetes. The AFR may be useful as a clinical tool for rapid assessment of risk for AGE-related long-term complications in diabetes and in other conditions associated with AGE accumulation.

Key Words: diabetes • advanced glycation end products • autofluorescence • noninvasive • complications