

OBJECTIVE To assess complication prevalence and identify protective factors in patients with diabetes duration of ≥ 50 years. Characterization of a complication-free subgroup in this cohort would suggest that some individuals are protected from diabetes complications and allow identification of endogenous protective factors.

RESEARCH DESIGN AND METHODS Cross-sectional, observational study of 351 U.S. residents who have survived with type 1 diabetes for ≥ 50 years (Medalists). Retinopathy, nephropathy, neuropathy, and cardiovascular disease were assessed in relation to HbA

^{1c}, lipids, and advanced glycation end products (AGEs). Retrospective chart review provided longitudinal ophthalmic data for a subgroup.

RESULTS A high proportion of Medalists remain free from proliferative diabetic retinopathy (PDR) (42.6%), nephropathy (86.9%), neuropathy (39.4%), or cardiovascular disease (51.5%). Current and longitudinal (the past 15 years) glycemic control were unrelated to complications. Subjects with high plasma carboxyethyl-lysine and pentosidine were 7.2-fold more likely to have any complication. Of Medalists without PDR, 96% with no retinopathy progression over the first 17 years of follow-up did not experience retinopathy worsening thereafter.

CONCLUSIONS The Medalist population is likely enriched for protective factors against complications. These factors might prove useful to the general population with diabetes if they can be used to induce protection against long-term complications. Specific AGE combinations were strongly associated with complications, indicating a link between AGE formation or processing with development of diabetic vasculopathy.

Footnotes

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