COMMENTS AND RESPONSES

# Retinopathy Predicts Cardiovascular Mortality in Type 2 Diabetic Men and Women

Response to Targher et al.

We thank Targher et al. (1) for their interest in our recent article (2). They compared the results from the Valpolicella Heart Diabetes Study (3) to our findings (2) and concluded that the association of retinopathy with cardiovascular disease (CVD) in type 2 diabetic subjects is principally explained by the occurrence of hypertension and proteinuria. Furthermore, they did not find a significant sex difference in the association of retinopathy with incident CVD events.

Targher et al. suggested that the relatively high cut-off for hypertension and a low frequency of retinopathy could partly explain our results. However, even after the adjustment for systolic blood pressure or pulse pressure as a continuous variable, our results remained essentially unchanged. The number of type 2 diabetic subjects in our study was 824, and the percentage of subjects with retinopathy (23%) was lower than in the Valpolicella Heart Diabetes Study, which reflects the shorter duration of diabetes in our study (mean ± SD 8 ± 4 years) in comparison with the Valpolicella Heart Diabetes Study (14 ± 3 years). This may lower the statistical power of our study.

Targher et al. demonstrated a central role of hypertension and proteinuria as risk factors for prevalent retinopathy and incident CVD. When we adjusted for other risk factors, including hypertension, urinary protein, and A1C, the hazard ratios slightly decreased in women but increased in men (2). We found a sex difference in the association of retinopathy with CVD (2), which was not observed in the Valpolicella Heart Diabetes Study. Sex differences in diabetes-related CVD have been observed in several previous studies, including ours (4), and therefore the sex difference in the retinopathy-associated risk of CVD is not surprising.

We conclude that retinopathy predicts CVD in Finns (2) independently of other risk factors, including blood pressure and proteinuria, indicating that there is a "common soil" for diabetic micro- and macrovascular complications associated with hyperglycemia. Because several previous studies have shown a sex difference in the risk of CVD in type 2 diabetic subjects, we believe that our finding that there is a sex difference in the role of retinopathy to predict CVD is likely to be a true observation. However, other population-based longitudinal studies are needed to confirm this conclusion.

AUNI JUUTILAINEN, MD[1]
SEPPO LEHTO, MD[1]
TAPANI RÖNNEMAA, MD[2]
KALEVI PYÖRÄLÄ, MD[1]
MARKKU LAAKSO, MD[1]

From the [1]Department of Medicine, Kuopio University Hospital, University of Kuopio, Kuopio, Finland; and the [2]Department of Medicine, University of Turku, Turku, Finland.

Address correspondence to Markku Laakso, Academy Professor, Department of Medicine, University of Kuopio and Kuopio University Hospital, 70210 Kuopio, Finland. E-mail: markku.laakso@kuh.fi.

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