Diabetes, Triglyceride Levels, and Other Risk Factors for Glaucoma in the National Health and Nutrition Examination Survey 2005-2008

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PURPOSE: To determine risk factors for glaucoma in a population-based study in the United States.

METHODS: Participants age 40 and older from the National Health and Nutrition Examination Survey underwent questionnaires, physical examination, laboratory tests, and vision tests including fundus imaging. Glaucoma was determined based on expert grading of fundus photographs. Regression modeling of glaucoma risk factors was performed.

RESULTS: Participants with glaucoma (172) were older (mean age 68.1 [95% confidence interval (CI) 65.6-70.7] vs. 56.4 years [95% CI 55.6-57.2, P < 0.001]), likely to have less than high school education (25.1% vs. 18.1%, P = 0.05), to have diabetes (23.1% vs. 10.8%, P < 0.001), to have central obesity (72.5% vs. 60.7%, P = 0.01), to have systolic hypertension (30.3% vs. 20.1%, P = 0.01), to have diastolic hypotension (30.3% vs. 13.9%, P < 0.001), and to be nonsmokers (91.0% vs. 79.3%, P = 0.002). Sex, poverty, access to health care, fasting glucose, insulin dependence, body mass index, cholesterol levels, diastolic hypertension, systolic hypotension, obstructive sleep apnea, and marijuana were not associated with glaucoma. Multivariable modeling showed associations between glaucoma and older age (odds ratio [OR] 1.09 per year, 95% CI 1.04-1.14), black race (OR 4.40, 95% CI 1.71-11.30), and poverty (OR 3.39, 95% CI 1.73-6.66). Diabetes was no longer associated with glaucoma after adjustment for triglyceride levels. Sex, education, insurance status, body mass index, blood pressure, obstructive sleep apnea, and smoking were not associated with glaucoma.

CONCLUSIONS: People who are older, of black race, and with lower income levels have a higher prevalence of glaucoma. A novel association between diabetes, triglyceride levels, and glaucoma is also identified.


PMID: 27111561