Diabetes, use of antidiabetic drugs, and the risk of glioma.

Seliger C¹, Ricci C¹, Meier CR¹, Bodmer M¹, Jick SS¹, Bogdahn U¹, Hau P¹, Leitzmann MF¹.

Abstract

BACKGROUND: Prior epidemiologic studies suggest inverse relations between diabetes and glioma risk, but the underlying mechanisms, including use of antidiabetic drugs, are unknown.

METHODS: We therefore performed a matched case-control analysis using the Clinical Practice Research Datalink (CPRD). We identified incident glioma cases diagnosed between 1995 and 2012 and matched each case with 10 controls on age, gender, calendar time, general practice, and years of active history in the CPRD. We performed conditional logistic regression to estimate odds ratios (ORs) with 95% CIs, adjusted for body mass index and smoking.

RESULTS: We identified 2005 cases and 20 050 controls. Diabetes was associated with decreased risk of glioma (OR = 0.74; 95% CI = 0.60-0.93), particularly glioblastoma (OR = 0.69; 95% CI = 0.51-0.94). Glioblastoma risk reduction was markedly pronounced among diabetic men (OR = 0.60; 95% CI = 0.40-0.90), most apparently for those with diabetes of long-term duration (OR for >5 vs 0 y = 0.46; 95% CI = 0.26-0.82) or poor glycemic control (OR for HbA1c ≥ 8 vs <6.5% = 0.20; 95% CI = 0.06-0.70). In contrast, the effect of diabetes on glioblastoma risk was absent among women (OR = 0.85; 95% CI = 0.53-1.36). No significant associations with glioma were found for use of metformin (OR for ≥ 30 vs 0 prescriptions = 0.72; 95% CI = 0.38-1.39), sulfonylureas (OR = 0.71; 95% CI = 0.39-1.30), or insulin (OR = 0.79; 95% CI = 0.37-1.69).

CONCLUSIONS: Antidiabetic treatment appears to be unrelated to glioma, but long-term diabetes duration and increased HbA1c both show decreased glioma risk. Stronger findings in men than women suggest low androgen levels concurrent with diabetes as a biologic mechanism.

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