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## Prediagnostic Plasma IgE Levels and Risk of Adult Glioma in Four Prospective Cohort Studies.

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### Abstract

**Background** Increased levels of serum immunoglobulin E (IgE) because of allergies have been inversely associated with risk of glioma in observational studies. Despite consistency across studies examining history of allergies and glioma, questions remain as to whether those are causal associations. An inverse association between serum IgE and risk of glioma was reported in a large case-control study, but reverse causality and treatment effects remain potential explanations for those findings. **Methods** We combined data from four prospective cohort studies and used a nested case-control design to examine the association between allergy and glioma. We included glioma case subjects who were confirmed from medical or pathology records or from death certificates, and with prediagnostic blood available. We matched three control subjects per case subject, and the final numbers for analyses were 169 case subjects and 520 control subjects. Total IgE, food allergen-specific IgE, and respiratory allergen-specific IgE levels were measured using a highly sensitive fluorescent assay. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using conditional logistic regression analysis. Stratified analyses were conducted by age and birth cohorts. **Results** Borderline elevated total IgE levels (25-100 kU/L) showed a statistically significant inverse association with glioma (OR = 0.63, 95% CI = 0.42 to 0.93), but no association was noted between elevated IgE (>100 kU/L) and glioma (OR = 0.98, 95% CI = 0.61 to 1.56) compared with clinically normal IgE levels (<25 kU/L). The association between glioma and total IgE was consistent for both men and women. Non-statistically significant inverse associations were noted for elevated IgE levels among individuals born before year 1930 (OR = 0.67, 95% CI = 0.34 to 1.34) and when restricting analyses to highly fatal (deceased within 2 years of diagnosis) glioma case subjects (OR = 0.64, 95% CI = 0.34 to 1.19) compared with individuals with clinically normal IgE levels. No associations were observed for either food allergen-specific or respiratory allergen-specific IgE levels. **Conclusions** Overall, our prospective findings are consistent with recent retrospective studies and support an association between total IgE levels and glioma. However, this association requires further elucidation.

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