ABSTRACT

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History of atopy confers improved outcomes in IDH mutant and wildtype lower grade gliomas.

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PURPOSE: A history of atopy or allergy has been shown to be protective against the development of glioma, however the effect of atopy on patient outcomes, especially in conjunction with the survival benefit associated with IDH mutation, has not yet been investigated, and is the focus of the study we present here.

METHODS: Low grade glioma (LGG) data from the TCGA was downloaded, along with IDH, TERT, 1p/19q and ATRX mutational status and genetic alterations. History of asthma, eczema, hay fever, animal, or food allergies, as documented in TCGA, was used to determine patient atopy status. Patients with missing variables were excluded from the study.

RESULTS: 374 LGG studies were included. Patients with a history of atopy demonstrated longer overall survival (OS) compared to those without (145.3 vs. 81.5 months, p = 00.0195). IDH mutant patients with atopy had longer OS compared those without atopy (158.8 vs. 85 months, p = 0.035). Multivariate cox regression analysis demonstrated that the effects of atopy on survival were independent of IDH and histological grade, (p = 0.002, HR 0.257, 95% 0.109-0.604), (p = < 0.001, HR 0.217, 95% 0.107-0.444), and (p = 0.004, HR 2.72, 95% 1.373-5.397), respectively. In terms of treatment outcomes, patients with atopy did not differ in treatment response compared to their counterpart. Pathway analysis demonstrated an upstream activation of the BDNF pathway (p = 0.00027).

CONCLUSION: A history of atopy confers a survival benefit in patients with diffuse low-grade glioma. Activation of the BDNF pathway may drive the observed differences.

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