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The risk and burden of thromboembolic and hemorrhagic events in patients with malignant gliomas receiving bevacizumab

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Abstract

Purpose: Bevacizumab has evolved as an integral treatment option for patients with high-grade gliomas. Little is known about clinical risk factors that predispose patients with high-grade gliomas receiving bevacizumab to VTE or ICH. We sought to characterize the clinical risk factors associated with risk of either event.

Methods: In this multi-institutional retrospective study, we first evaluated patients with high-grade gliomas who were treated with bevacizumab at University of Texas MD Anderson Cancer Center from 2015-2021. We compared clinical and treatment-related factors among three cohorts: those who developed VTE, ICH, or neither. We further compared survival outcomes of these patients from the time of bevacizumab initiation. Then to further confirm our results in a non-cancer center hospital setting we evaluated patients from two Ascension Seton Hospitals in Austin, Texas which are affiliated with Dell Medical School at the University of Texas at Austin from 2017-2022.

Results: We found that the presence of cerebral macrobleeding, defined as a magnetic susceptibility of > 1 cm^3 on magnetic resonance imaging, was highly associated with risk of developing ICH after initiation of bevacizumab. Development of ICH was significantly associated with poorer survival outcomes. We did not find a statistically significant effect of VTE on survival after bevacizumab initiation.

Conclusion: In order to stratify the risk for developing ICH before the initiation of bevacizumab, we recommend to assess for the presence of cerebral macrobleeding as it is associated with ICH development.

Keywords: Bevacizumab; Cerebral macrobleeding; High-grade glioma; Intracerebral hemorrhage; Venous thromboembolism.