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Risk of brain tumors following traumatic brain injury: A retrospective cohort study

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Abstract

Objective: It remains unclear if a Traumatic Brain Injury (TBI) increases the risk of primary brain tumor development in the years following injury. The aim of this study was to examine the association between TBI severity (mild vs. moderate-to-severe) and the long-term risk of benign and malignant brain tumors, stratified by age and sex.

Methods: This study is a retrospective cohort study using the TriNetX platform, with de-identified electronic health records from 60 U.S. healthcare organizations and consisting of 246,392 patients diagnosed with TBI (mild or moderate-to-severe) between 2004 and 2014, followed for 10 years.

Results: Mild TBI was not significantly associated with an increased risk of brain tumors across any age or sex group. In contrast, moderate-to-severe TBI was linked to an elevated risk of benign tumors in females aged 61-80 (HR: 1.82), as well as in males aged 41-60 (HR: 2.73) and 61-80 (HR: 1.76). Additionally, moderate-to-severe TBI increased the risk of malignant tumors in females aged 21-80 (highest HR: 2.29 in ages 61-80) and in males aged 41-80 (highest HR: 2.13 in ages 41-60).

Conclusion: These findings suggest that TBI is associated with benign and malignant brain neoplasm development, particularly in middle-aged and older individuals.

Keywords: Benign; Malignant brain tumor; Traumatic brain injury.

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