Predicting risk of blood clots in brain tumors

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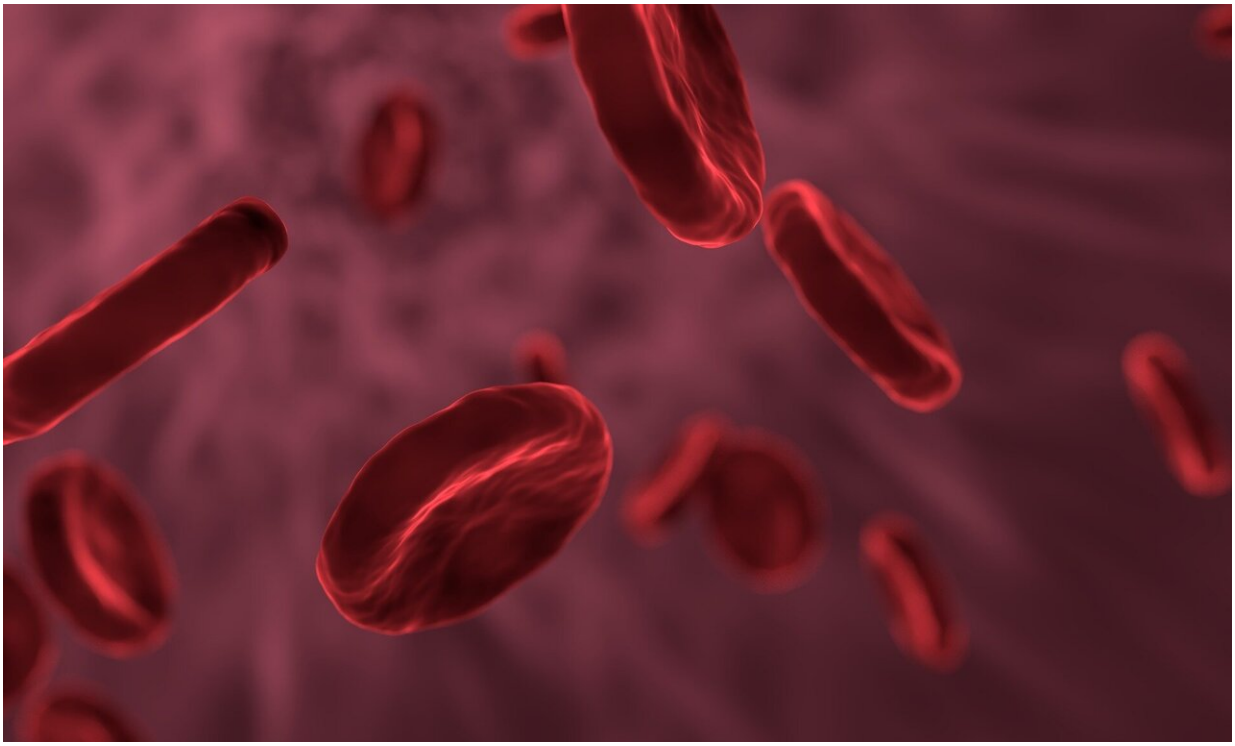

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Northwestern Medicine scientists have developed a new tool to help physicians predict the risk of venous thromboembolism in patients with adult-type diffuse gliomas, results published in the journal *Blood*.

Venous thromboembolisms (VTE), blood clots that form in veins, can be life-threatening for patients with adult-type diffuse gliomas, the most

common type of malignant tumor arising in the brain.

To create the risk prediction tool, investigators analyzed arterial blood, tumor tissue and other data from 483 patients with newly diagnosed adult-type diffuse glioma.

They found seven factors which predicted increased risk of VTE in those patients: prior history of VTE, hypertension, asthma, elevated white blood cell count, higher glioma grade, increasing patient age and elevated body mass index.

Conversely, investigators found that mutations in IDH1 or IDH2 genes, hypothyroidism, and MGMT gene inactivation all predicted a reduced risk of VTE.

Those ten variables were then combined to create a novel web-based VTE prediction tool, said Craig M Horbinski, MD, Ph.D., director of Neuropathology in the Department of Pathology, director of the Pathology Core Facility at the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, and senior author of the study.

"For the first time, we have an evidence-based prediction of venous thromboembolism specifically for glioma patients," he said. "This tool is a web-based calculator. You enter in basic information about the patient and tumor, and get a percent of risk at one, three, six and 12 months."

Armed with that information, physicians can weigh the risk of a clot against other risks that come with preemptively administering anticoagulants, which can sometimes cause brain hemorrhages, Horbinski said.

"When I informally polled physicians on how they assess the risk of these blood clots, I got various answers," Horbinski said. "It all depends

on how aggressive they are about anti-thrombotic prophylaxis. Physicians can give patients heparin up front but often would not know if a particular patient was really at risk of a blood clot or not. Plus, heparin administration is painful and may increase the risk of bleeding in the brain. Before now, there's just never been rigorous evidence to guide that decision-making."

Now, Horbinski said he is planning to conduct a trial with high-risk patients to further validate the tool and provide better guidance on which patients would benefit the most from preventative anticoagulants.

More information: Kirsten Bell Burdett et al, Determining venous thromboembolism risk in patients with adult-type diffuse glioma, *Blood* (2022). DOI: 10.1182/blood.2022017858

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