Intracranial hemorrhage (ICH)

Hemorrhage, or bleeding, within the skull.

Affects up to 1% of patients on oral anticoagulation per year, and is the most feared and devastating complication of this treatment. After such an event, it is unclear whether anticoagulant therapy should be resumed. Such a decision hinges upon the assessment of the competing risks of hematoma growth or recurrent ICH and thromboembolic events. ICH location and the risk for ischaemic cerebrovascular events seem to be the key factors that lead to the risk/benefit balance of restarting anticoagulation after ICH.

Classification

Intracranial Hemorrhage Classification.

Etiology

Anticoagulant Related Intracerebral Hemorrhage.

Intracranial hemorrhage following endovascular intervention.

Intracranial hemorrhage from cerebral cavernous malformation

Intracranial hemorrhage from Intracranial metastases

Intracranial hemorrhage and anticoagulation…

Diagnosis

Intracranial Hemorrhage Diagnosis.

Case series

A retrospective review (2013-2022) identified young (18-60 years) patients who underwent DSA for ICH. HTN history, ICH location, presence/absence of subarachnoid hemorrhage (SAH), and computed tomography angiography (CTA) findings were collected. The main outcome was DSA-positivity, defined as the presence of an AVM, aneurysm, Moyamoya disease, reversible cerebral vasoconstriction syndrome, or dural arteriovenous fistula on DSA.

Two hundred sixty patients were included, and the DSA-positivity rate was 19%. DSA-positivity was lower in hypertensive patients with ICHs in the cerebellum, pons, or basal ganglia compared to the rest of the patient sample (9% vs 26%, p = 0.0002, Fisher's exact test). We developed the ICH-Angio score (0-5 points) based on CTA findings, ICH location, HTN history, and presence of SAH to predict

risk of underlying vascular lesions. DSA-positivity was lower in those with a score of 0 (0/62; 0%) compared to a score of 1 (5/52; 10%), 2 (17/48; 35%), 3 (10/20; 50%), 4 (5/6; 83%), or 5 (3/3; 100%).

The ICH-Angio score was able to non-invasively rule out an underlying vascular etiology for ICH in up to one-third of patients. HTN, ICH location, CTA findings, and associated SAH can identify patients at low risk for harboring underlying vascular lesions [1].

Fernando et al. retrospectively analyzed a prospectively collected registry (2011-2016) and included consecutive adult patients from 2 hospitals admitted to ICU with intracranial hemorrhage. Patients were categorized on the basis of preadmission oral antiplatelet use. They excluded patients with preadmission anticoagulant use. The primary outcome was in-hospital mortality and was analyzed using a multivariable logistic regression model. Contributors to total hospital costs were analyzed using a generalized linear model with log link and gamma distribution.

Of 720 included patients with intracranial hemorrhage, 107 (14.9%) had been using an oral antiplatelet agent at the time of ICU admission. Oral antiplatelet use was not associated with in-hospital mortality (adjusted odds ratio: 1.31 [95% confidence interval [CI]: 0.93-2.22]). Evaluation of total costs also revealed no association with oral antiplatelet use (adjusted ratio of means [aROM]: 0.92 [95% CI: 0.82-1.02, P = .10]). Total cost among patients with intracranial hemorrhage was driven by illness severity (aROM: 1.96 [95% CI: 1.94-1.98], P < .001), increasing ICU length of stay (aROM: 1.05 [95% CI: 1.05-1.06], P < .001), and use of invasive mechanical ventilation (aROM: 1.76 [95% CI: 1.68-1.86], P < .001).

Among ICU patients admitted with intracranial hemorrhage, preadmission oral antiplatelet use was not associated with increased in-hospital mortality or hospital costs. These findings have important prognostic implications for clinicians who care for patients with intracranial hemorrhage [2]

1)
El-Abtah ME, Kashkoush A, Achey R, Patterson T, Moore NZ, Bain MD. Diagnostic yield of cerebral angiography for intracranial hemorrhage in young patients: A single-center retrospective analysis. Interv Neuroradiol. 2023 Jan 23:15910199231152505. doi: 10.1177/15910199231152505. Epub ahead of print. PMID: 36691317.
2)
Fernando SM, Mok G, Rochwerg B, English SW, Thavorn K, McCredie VA, Dowlatshahi D, Perry JJ, Wijdicks EFM, Reardon PM, Tanuseputro P, Kyeremanteng K. Preadmission Antiplatelet Use and Associated Outcomes and Costs Among ICU Patients With Intracranial Hemorrhage. J Intensive Care Med. 2019 Nov 19:885066619885347. doi: 10.1177/0885066619885347. [Epub ahead of print] PubMed PMID: 31741418.