Anticoagulation management in traumatic brain injury

Clinical Scenarios

- dabigatran_reversal_in_mild_traumatic_brain_injury
- delayed_bleeding after TBI or craniotomy
- preoperative_management of anticoagulated patients
- Management of venous_sinus_thrombosis in neurocritical care

Best Practice

- Always record **exact drug, dose, and last intake time**
- Assess **renal function** before estimating clearance (especially DOACs)
- In trauma, treat all anticoagulated patients as **high risk**
- In elective surgery, follow **interruption and bridging protocols**

Related Entries

- renal_function
- clinical_deterioration
- anticoagulation_reversal_protocol
- traumatic_brain_injury
- postoperative_complications

Thank you. Here's the structured summary and critical review of the article:

Systematic Reviews

In a Systematic Review * *Savi et al.* from the * *Cambridge University Hospitals, Cambridge; Cleveland Clinic, Cleveland* published in * *Neurosurgical Clinics of North America* * **Purpose and Conclusions**: This systematic review evaluates anticoagulation management in traumatic brain injury (TBI) and spinal cord injury (SCI), emphasizing the evolving preference for prothrombin complex concentrate (PCC), particularly 4-factor PCC (4F-PCC), over other reversal agents. It highlights improved outcomes with 4F-PCC and explores the emerging role of viscoelastic assays. The authors underscore a critical lack of large clinical trials, limiting consensus on standardized care protocols [1].

This review tackles an important and increasingly complex domain in neurocritical care—managing coagulation in the setting of CNS trauma. While the article offers a sweeping historical view (1984–2024) and outlines emerging clinical trends, its methodological rigor, data synthesis, and clinical applicability suffer from several limitations:

Study Design and Methodology

Despite being labeled a systematic review, there is no mention of registration with PROSPERO or adherence to PRISMA guidelines. The review lacks clarity on:

- Search strategy (databases, terms, inclusion/exclusion criteria),
- Study selection process,
- Risk of bias assessment or quality grading of included studies.

These omissions critically weaken the review's transparency and reproducibility, which are non-negotiable in high-impact neurosurgical publications.

Data Interpretation and Statistical Rigor

The narrative synthesis appears largely descriptive, with vague references to "most studies" supporting 4F-PCC. There is no quantitative meta-analysis or pooled effect sizes, limiting the reader's ability to gauge the magnitude of benefit or harm. Furthermore:

- No subgroup analyses (e.g., TBI vs. SCI, DOACs vs. VKAs) are provided.
- No discussion on heterogeneity or publication bias is included.

The discussion of viscoelastic assays remains speculative and lacks data correlating their use with outcome improvement, making this segment more editorial than evidentiary.

Relevance and Novelty

The topic is undeniably relevant, especially given increasing use of DOACs in aging populations. However, the novelty is modest—previous reviews have similarly emphasized PCC and viscoelastic testing. Without new data or meta-analytical strength, the manuscript contributes more as an updated perspective than a transformative advance.

Ethical Considerations

Conflict of interest statement

Disclosure The authors have nothing to disclose.

Conclusion: This manuscript presents a timely clinical narrative but fails to meet the methodological standards expected of a systematic review. Major revisions are necessary to enhance its scientific rigor, including full methodological transparency, structured data synthesis, and critical appraisal of included studies.

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1)

Savi M, Hawryluk G. Thrombosis and Coagulopathy. Neurosurg Clin N Am. 2025 Jul;36(3):375-385. doi: 10.1016/j.nec.2025.03.006. Epub 2025 Apr 29. PMID: 40543946.