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INVITED COMMENTARY

Invited Commentary Re: Early Chemical Thromboprophylaxis does not Increase the Risk of Intracranial Hematoma Progression in Patients with Isolated Severe Traumatic Brain Injury

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Venous thromboembolic events (VTE) are a major concern after trauma, and preventative measures including early initiation of chemoprophylaxis (VTEp) are encouraged. The balance between risk of VTE and potential exacerbation of bleeding, however, is of extreme importance, especially after traumatic brain injury (TBI). Early initiation of low molecular weight heparin after TBI has repeatedly been shown using large population database cohorts, to decrease VTE and improve mortality. The use of large populations corrects for the low incidence of VTE, but there is concern that this method fails to adequately address the safety of anticoagulation and potential injury progression or functional outcome change.

Dr. Störmann and colleagues present a well-written 4-year review of 292 patients with isolated TBI including description of hemorrhage progression and operative intervention in a population stratified based on time to initiation of VTEp [1]. As expected from a single-center analysis, there is a concern that the relatively small study population is underpowered to provide clear conclusions regarding risk of VTE relative to time of initiation, as no patients in the VTEp groups developed VTE. Despite this, the imaging and clinical information presented in this study provides context and insight not possible to achieve with the large-volume databases currently available. These data begin to address the question of safety of VTEp after TBI and how we may evaluate and categorize this risk.

Many contemporary database studies use either return to the operating room or need for operative intervention after initiation of VTE prophylaxis as a surrogate to assess safety, as the indication for operation is not captured. In the present manuscript, of the six patients that received delayed craniectomy, two had not yet received VTEp and the remaining four were operated on, not for injury expansion but for overall edema and chronic subdural hematoma evacuation. The surgical indication for delayed craniectomy was critical to support the evaluation of safety of early VTEp in these cases. Without such detail, a large database study would be obligated to categorize these as potential bleeding complications and thus inaccurately evaluate risk.

Dr. Störmann reports injury progression in 45% of patients prior to initiation of VTEp and 13.5% after, rates that far exceed standard expectations. As a single-center study, this population may not be representative of a larger population and, more importantly, the clinical and functional significance of this finding was not addressed. These data do, however, highlight the importance of including injury progression as a factor in assessing safety of VTEp.

While the results of the current study regarding timing of VTEp should be interpreted with caution due to the relatively small sample size and low number of VTE events, the authors present provocative data that question the ability to extrapolate safety of VTEp in large retrospective database studies. Injury progression, the clinical significance of this progression, and the indications for operative or procedural intervention are critical to the determination of VTEp safety after TBI and should be considered carefully before formalizing national recommendations.

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Reference

1. Störmann P, Osinloye W, Freiman TM et al (2019) Early chemical thromboprophylaxis does not increase the risk of intracranial hematoma progression in patients with isolated severe traumatic brain injury. World J Surg. https://doi.org/10.1007/s00268-019-05072-1