

Uses of Fibrinogen Concentrate in the Management of Trauma-Induced Coagulopathy in the Prehospital Environment: A Scoping Review

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Abstract : Trauma-induced coagulopathy remains a significant contributor to mortality in severely injured patients. Fibrinogen is essential for early hemostasis and is recognized as the first coagulation factor to fall below critical levels, compromising the coagulation cascade. Early administration of fibrinogen concentrate may be feasible and effective to prevent coagulopathy. We conducted this scoping review to characterize the existing quantity of literature, and to explore the usage of prehospital fibrinogen concentrate products in improving clinical outcomes in trauma patients. **Methods:** A search strategy was developed in consultation with an information specialist. We searched MEDLINE, Embase, Cochrane, and Scopus from inception to May 6th 2024. English studies evaluating prehospital/military usage of fibrinogen concentrate in trauma patients were included. Studies were assessed by three independent reviewers for meeting inclusion and exclusion criteria. Reference lists of included articles were reviewed to identify additional studies meeting inclusion criteria. Clinical endpoints regarding fibrinogen concentrate were extracted and synthesized. **Results:** The literature search returned 1301 articles with seven studies meeting the inclusion criteria. Five studies (71%) were conducted in civilian settings and two studies (29%) were conducted in military settings. Of the included studies, three (43%) utilized a randomized control trial. We identified seven outcomes that compared varying concentrations of fibrinogen or fibrinogen concentrate to a placebo group. The outcomes included overall mortality, death from hemorrhage, thromboembolic events, clotting time, maximum clot firmness, clot stability at ER admission, and fibrinogen concentration at ER admission. Apart from thromboembolic events, all other reported outcomes showed statistically significant differences in group comparisons, determined using p values. The four (57%) non-clinical studies underscored the robustness, practicality, and degree of fibrinogen concentrate utilization in military environments and retrieval services. **Conclusion:** Preliminary research suggests that prehospital fibrinogen concentrate administration in traumatic bleeding patients is both feasible and effective, improving mortality and clotting parameters. While implementing a time-saving and proactive approach with fibrinogen holds potential for enhancing trauma care, the current evidence is limited. Further studies in this novel field are warranted.

Keywords : fibrinogen concentrate, prehospital, military, trauma, trauma-induced coagulopathy

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