

Traumatic coagulopathy and massive transfusion: improving outcomes and saving blood

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Plain English summary

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Plain English summary

Severe bleeding as a result of traumatic injury and damage to blood vessels is life-threatening. We found that some patients do not clot properly because clotting is disrupted by blood loss itself, a condition termed acute traumatic coagulopathy. Blood transfusions are important to treatment but have risks and side effects. Currently, after patients have received red blood cell transfusions, plasma and platelet transfusions are given to replace lost clotting factors. Routine measures of functional blood clotting are not available quickly enough to guide treatment. Thus, some patients potentially receive too few clotting factors and have worse outcomes, whereas others may receive too many and are exposed to extra risks while wasting precious blood stocks.

Few data describe current UK practice in terms of the incidence of transfusion for trauma, patient outcomes, demand for blood components and treatment costs. We conducted a national multicentre study which demonstrated that nearly 7800 adult trauma patients require a life-saving transfusion per year, at a cost of approximately £85M. Of those with massive bleeding we found that, on average, nearly 50% will die and many of these deaths occur within the first few hours after injury. We have identified key aspects of the underlying clotting problem that may be targets for improved treatments in the future, as well as methods to diagnose them quickly so that such therapies could be directed appropriately for each specific treatment. Additionally, we have developed a model for mass casualty events such as terrorist bombings that we are using to test ways in which trauma centres can best manage blood stocks during such events.

This programme of work has led to new understandings of coagulopathy and diagnostic tools for its rapid identification and management. Over the lifetime of the research programme we doubled survival in patients with severe bleeding by applying the results of our research to clinical practice. This work is now incorporated into national guidelines and we continue to study how we can further reduce the ongoing high mortality from this critical condition.

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