



Letter to the Editor

Cost-effectiveness improvement in trauma bleeding management: Whole blood transfusion might also be considered!



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Recent military experiences showed that haemorrhage was the leading cause of preventable death among casualties. Immediate and specific resuscitation is required to avoid trauma-induced coagulopathy, that severely increases transfusion requirements and mortality.

We have read with interest the article of Guth and colleagues describing the consequences of the modification of trauma bleeding management in a French level 1 trauma centre [1]. The authors implemented a bundle of cares against acute coagulopathy based on a thromboelastometry-guided haemostatic therapy, which led to reduce blood products consumption and the incidence of massive transfusion. The overall cost was also reduced after propensity matching, even if this strategy was in fact associated with a decrease in blood product cost and a significant increase in coagulation factors concentrates cost. We agree that cost-effectiveness improvement in trauma bleeding management is of special interest. For this purpose, whole blood transfusion might also be considered for both clinical benefit and medico-economic interest.

In recent armed conflicts, whole blood has been widely used, mainly due to logistics constraints in military setting and austere environment. Warm fresh whole blood transfusion consists of drawing blood from a pretested iso-group donor in order to immediately infuse it to a casualty. During French army deployments, whole blood is the only available source of platelets and a valuable solution to bring red blood cells and clotting factors despite the limited amount of available blood components [2]. Whole blood transfusion is a logistically easier alternative to component therapy since it offers all the required functionalities in the same bag. Retrospective studies in military settings subsequently showed that trauma patients receiving fresh whole blood had improved outcomes compared to those receiving conventional component therapy [3]. Finally, *in vitro* characterisation also demonstrated that whole blood clotting profile was greater than the sum of its components [4].

For these reasons, whole blood is now considered for civilian use in massive bleeding patients, after overcoming few misconceptions. This practice has already been implemented in civilian hospitals and prehospital environment, using group O cold whole blood units [5]. Whereas platelets are usually stored at 20–24 °C under agitation in order to preserve their circulation ability, cold stored platelets demonstrated better aggregation capacity, which might be more convenient for life-threatening bleeding [6]. Moreover, the risk of haemolysis among non-group O recipients is controlled by selecting only units with low titres of anti-A and anti-B haemagglutinin. In these conditions, group O whole blood transfusion to non-group O trauma patients is not associated with clinically significant changes in laboratory haemolysis markers [7].

Cold whole blood production is allowed in France since February 2018, with a 21-day shelf life between 2–6 °C. Before whole blood transfusion may be implemented in the guidelines for massive bleeding trauma patients, a prospective multicentric study has been promoted by the French Military Health Service, through cooperation between the French Military Blood Institute (CTSA) and the French Blood Establishment (EFS) (STORHM study – whole blood for massive bleeding resuscitation). Regarding medico-economic aspects, whole blood has been referenced in the French legislation in December 2018, with a sale price of 121 euros per unit [8]. Compared with costs reported by Guth et al., replacement of one red blood cell unit (179 euros), one fresh frozen plasma (97 euros) and one platelet concentrate unit (82 euros) by a single whole blood unit would represent an economy of 237 euros [1]. As part of the STORHM study, whole blood units are planned to be recycled in red blood cell units if not used in the first 7 days, which also contributes to decrease the overall cost of this practice. Finally, if the STORHM study brings evidences about safety, efficiency and ease-of-use, cold whole blood will become a relevant solution to be considered for cost-effectiveness improvement in trauma bleeding management.

Disclosure of interest

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Author contributions

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