

Letter Hemorrhagic shock: a review

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I read with interest the review by Prof. Gutierrez and colleagues on hemorrhagic shock [1]. The treatment of hemorrhagic shock is addressed in the review, and mention is made of the main goals: to stop the source of hemorrhage and to restore the circulating volume. Conserving blood products, on the grounds of cost, restricted availability and their pathophysiological effects, is becoming a necessary shift in the approach to these difficult patients and was not touched upon in the review. There have been clear advances in recent years in developing other strategies to aggressively stem the flow.

Damage control surgery in trauma and embolization are certainly useful tools in the control of bleeding.

Pharmacological manipulation of the coagulation system is a rapidly expanding field of research. Activated recombinant factor VII (Factor VIIa) is a hemostatic agent originally developed for the hemophilia population, but it is emerging as a very effective way of treating uncontrolled hemorrhage in patients without pre-existing factor deficiencies. A heterogeneous case series of major hemorrhage was reported last year, in which 80% of the cases given Factor VIIa responded with complete or partial cessation of bleeding [2]. Data from the trauma environment with massive bleeding suggest a useful role for Factor VIIa [3], and further studies are ongoing.

Competing interests

The author declares that he has no competing interests.

Authors' response

H David Reines, Marian Wulf-Gutierrez and Guillermo Gutierrez

We thank Dr Chapman for his comments on new approaches to control hemorrhage. We agree that conservation of blood and blood products is not just an economic concern, but it is necessary to protect a limited resource and to prevent untoward effects of such products. Our sections on hypertonic saline and the use of blood substitutes were meant to address this issue directly. We limited our discussion to a general discussion of hemorrhagic shock and did not specifically address surgical approaches to the control of bleeding. 'Damage control' and packing is a valid concept in the treatment of severely injured patients with hemorrhage [4]. This approach was frequently used in battlefields, and has become more popular in civilian injury as a method for preventing death from coagulopathy and hypothermia in the operating room. The use of radiological embolization as a technique to control ongoing hemorrhage from solid organs such as the spleen and the liver has also supplemented its use in pelvic hemorrhage. This technique is

not necessarily an ideal therapy for patients who are in shock. Operative intervention is still necessary in unstable patients.

We agree that pharmacological manipulation may be an adjunct to good surgical practice. There are anecdotal reports on the use of activated recombinant factor VII to control bleeding in trauma patients, as well as in numerous other patient populations who do not have hemophilia. The unencumbered use of this extremely expensive treatment has led to the loss of millions of dollars in uncompensated care and occasional significant complications. The present status of this potentially important addition to the armamentarium is under investigation. Prospective studies need to be performed to establish efficacy and criteria for use before we embark on this new approach.

Competing interests

The authors declare that they have no competing interests.

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