Frequency, risk stratification and therapeutic management of acute post-traumatic coagulopathy

M. Maegele

Department of Trauma and Orthopedic Surgery, University of Witten/Herdecke, Cologne-Merheim Medical Center, Cologne, Germany
Institute for Research in Operative Medicine, University of Witten/Herdecke, Cologne-Merheim Medical Center, Cologne, Germany

Background Uncontrolled haemorrhage is still responsible for more than 50% of all trauma-related deaths within the first 48 h after hospital admission. Clinical observations together with recent research resulted in a new appreciation of the central role of coagulopathy in acute trauma care. A synopsis of different analyses based on datasets from severely multiple-injured patients derived from the TR-DGU database (Trauma Registry of the Deutsche Gesellschaft für Unfallchirurgie (DGU)/German Society of Trauma Surgery) with respect to incidence, risk stratification and therapeutic management of acute post-traumatic coagulopathy is presented.

Methods Retrospective analyses based on datasets from severely multiple-injured patients derived from the TR-DGU database and development/validation of a scoring system (TASH score = trauma-associated severe haemorrhage) that allows an early and reliable estimation for the probability of massive transfusion as a surrogate for life-threatening haemorrhage after severe multiple injuries.

Results/conclusion There is a high frequency of acute post-traumatic coagulopathy already present upon ER admission which is associated with significant morbidity and mortality in multiple-injured patients. The TASH score is recognized as an easy-to-calculate and valid scoring system to predict the individual’s probability for massive transfusion and thus ongoing life-threatening haemorrhage at a very early stage after severe multiple injuries. An early aggressive management of acute post-traumatic coagulopathy including a more balanced administration of blood products to favour improved outcome is advocated.

Key words: coagulopathy, epidemiology, management, risk stratification, trauma.

Introduction

Trauma is the leading cause of death worldwide in persons aged 5 to 44 years [1] and accounts for approximately 10% of all deaths in general [2]. Despite substantial improvements in acute trauma care, uncontrolled haemorrhage is responsible for more than 50% of all trauma-related deaths within the first 48 h after hospital admission [3]. These clinical observations together with recent research resulted in a new appreciation of the central role of coagulopathy in acute trauma care. Current literature suggests that traumatic coagulopathy is multifactorial with certain mechanisms being predominant, whereas others manifest only in specific clinical states [4] (Fig. 1). There appear to be six key initiators of coagulopathy in trauma: tissue trauma, shock, haemodilution, hypothermia, acidemia and inflammation [4]. Most recently, Brohi et al. [5] emphasized the role of hypoperfusion for the initiation of