INTRODUCTION

In April 2013, the “Updated European Guideline on the Management of Bleeding and Coagulopathy following Major Trauma” published by Donat R. Spahn et al. as well as the “Guidelines on the Management of Severe Perioperative Bleeding” from the European Society of Anaesthesiology (ESA) written by Sibylle A. Kozek-Langenecker et al. have been published online. The latter were accompanied by an invited commentary “All you ever wanted to know about perioperative bleeding” written by Donat R. Spahn and Rolf Rossaint. At the same time, the “STOP the Bleeding Campaign” was launched by the authors of the European Trauma Guidelines under the aegis of Rolf Rossant and Donat R. Spahn.

Guidelines on severe bleeding management: a European Perspective

Recommendations dealing with viscoelastic testing and goal-directed therapy

The ESA Guidelines on the Management of Severe Perioperative Bleeding are part of the ESA’s efforts to increase patient safety as declared in the “Helsinki Declaration of Patient Safety in Anaesthesiology”. They are the result of two years of work by the ESA Task Force on the Management of Severe Perioperative Bleeding founded in 2010 and led by Sibylle Kozek-Langenecker. An electronic database search without language restriction from 2000 to 2012, supported by the Cochrane group, resulted in 20,664 abstracts. 9,376 references were reviewed for possible inclusion and 1,466 relevant publications were cited in the guidelines, finally. Overall, 224 recommendations graded for strength (1 or 2) and level of evidence (A, B or C) were given in 12 chapters and 113 pages. The GRADE classification system is as follows: 1 = strong recommendation; 2 = weak recommendation (suggestion); A = high level of evidence; B = moderate level of evidence; C = low level of evidence.

The final draft of the ESA guidelines has been posted on the ESA website for four weeks and after considering suggested changes ratified by the ESA Guideline Committee and ESA Board. The “STOP the Bleeding Campaign” aims to increase awareness of the phenomenon of post-traumatic coagulopathy and the appropriate treatment of trauma patients according to the published European guidelines. The “STOP the Bleeding Campaign” focuses on the implementation of these guidelines into clinical practice with the aim to reduce the number of patients who die within 24 hours after arrival in the hospital due to exsanguination by a minimum of 20% within the next 5 years. Both guidelines attract notice to the increasing evidence for the advantages of viscoelastic test and goal-directed therapy in the management of severe post-traumatic and peri-operative bleeding. In this newsletter, we focus on the recommendations of these guidelines dealing with viscoelastic testing and goal-directed therapy. Of course, we are aware of the fact that Thromboelastometry and goal-directed therapy is not the only true part of bleeding management but have to be an integral part of a multidisciplinary concept of Patient Blood Management. Therefore, we encourage all readers to download and read the whole guidelines and to implement these guidelines into clinical practice according to the aims of the “STOP the Bleeding Campaign”.

The Updated European Trauma Guidelines, first published in 2007 and already updated in 2010, considered changes in clinical practice that have taken place since the last update as a result of both, new evidence and changes in the general availability of relevant agents and technologies. The most important addition is a new section that discusses the need for every institution to develop, implement and adhere to an evidence based clinical protocol (algorithm) to manage traumatically injured patients. The GRADE classification system has been used in the European Trauma Guidelines, too.
Management of bleeding and coagulopathy following major trauma: an updated European guideline

“A multidisciplinary approach to the management of the traumatically injured patient remains the cornerstone of optimal patient care. Each institution needs to develop, implement and adhere to an evidence-based management protocol that has been adapted to local circumstances. As new evidence becomes available, both these clinical practice guidelines and local protocols will need to evolve accordingly.”

Recommendations dealing with viscoelastic testing and goal-directed therapy

II. Diagnosis and monitoring of bleeding
Coagulation monitoring

Recommendation 12
We recommend that routine practice to detect post-traumatic coagulopathy include the early, repeated and combined measurement of prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen and platelets. (Grade 1C)

We recommend that viscoelastic methods also be performed to assist in characterizing the coagulopathy and in guiding haemostatic therapy. (Grade 1C)

V. Management of bleeding and coagulation
Coagulation monitoring

Recommendation 26
We recommend the initial administration of plasma (fresh frozen plasma (FFP) or pathogen-inactivated plasma) (Grade 1B) or fibrinogen (Grade 1C) in patients with massive bleeding. If further plasma is administered, we suggest an optimal plasma:red blood cell ratio of at least 1:2. (Grade 2C)

We recommend that plasma transfusion be avoided in patients without substantial bleeding. (Grade 1B)

Fibrinogen and cryoprecipitate

Recommendation 27
We recommend treatment with fibrinogen concentrate or cryoprecipitate in the continuing management of the patient if significant bleeding is accompanied by thromboelastometric signs of a functional fibrinogen deficit or a plasma fibrinogen level of less than 1.5 to 2.0 g/l. (Grade 1C)

We suggest an initial fibrinogen concentrate dose of 3 to 4 g or 50 mg/kg of cryoprecipitate, which is approximately equivalent to 15 to 20 single donor units in a 70 kg adult. Repeat doses may be guided by viscoelastic monitoring and laboratory assessment of fibrinogen levels. (Grade 2C)

Plasma

Recommendation 23
We recommend monitoring and measures to support coagulation be initiated as early as possible. (Grade 1C)

Prothrombin complex concentrate

Recommendation 31
We recommend the early use of prothrombin complex concentrate (PCC) for the emergency reversal of vitamin K-dependent oral anticoagulants. (Grade 1B)

If a concentrate-based goal-directed strategy is applied, we suggest that PCC be administered in the bleeding patient with thromboelastometric evidence of delayed coagulation initiation. (Grade 2C)

VI. Treatment pathway
Treatment algorithm

Recommendation 35
We recommend that each institution implement an evidence-based treatment algorithm for the bleeding trauma patient. (Grade 1C)
Management of severe perioperative bleeding Guidelines from the European Society of Anaesthesiology²

"The purpose of these guidelines is to provide an overview of current knowledge on the subject with an assessment of the quality of the evidence in order to allow anaesthetists throughout Europe to integrate this knowledge into daily patient care wherever possible."²

Recommendations, suggestions and statements dealing with viscoelastic testing and goal-directed therapy

Evaluation of coagulation status

We recommend the application of transfusion algorithms incorporating predefined intervention triggers to guide haemostatic intervention during intraoperative bleeding. 1B

We recommend the application of transfusion algorithms incorporating predefined intervention triggers based on point-of-care (POC) coagulation monitoring assays to guide haemostatic intervention during cardiovascular surgery. 1C

Coagulation management

We recommend treatment with fibrinogen concentrate if significant bleeding is accompanied by at least suspected low fibrinogen concentrations or function. 1C

Cost implications

Bleeding and transfusion of allogeneic blood products independently increase morbidity, mortality, length of stay in ICU and hospital, and costs. B

Implementation of transfusion and coagulation management algorithms (based on ROTEM/TEG) can reduce transfusion-associated costs in trauma, cardiac surgery and liver transplantation. B

Goal-directed therapy with coagulation factor concentrates (fibrinogen and/or PCC) may reduce transfusion associated costs in trauma, cardiac surgery and liver transplantation. B

Thromboembolic events are associated with increased in-hospital and post-hospital costs. B

Targeted therapy with fibrinogen and/or PCC guided by ROTEM/TEG is not associated with an increased incidence of thromboembolic events. C

Algorithms in specific clinical fields

- Cardiovascular surgery
We recommend that fibrinogen concentrate infusion guided by point-of-care viscoelastic coagulation monitoring should be used to reduce perioperative blood loss in complex cardiovascular surgery. 1B

We recommend the use of standardized haemostatic algorithms with predefined intervention triggers. 1A

- Obstetric bleeding
We recommend that peripartum haemorrhage should be managed by a multidisciplinary team. An escalating management protocol including uterotonics drugs, surgical and/or endovascular interventions, and procoagulant drugs should be available. 1C

Thromboelastometry can identify obstetric coagulopathy and hyperfibrinolysis and guide haemostatic therapy. C

In life-threatening PPH, we suggest a transfusion protocol with a fixed product ratio or individualized procoagulant intervention and factor substitution. 2C

- Orthopaedic surgery and neurosurgery
In elective orthopaedic surgery, we recommend the implementation of a blood transfusion protocol (algorithm), together with staff education. 1B

Allogeneic blood transfusion is associated with an increased incidence of nosocomial infections. B

We suggest the use of viscoelastic tests (ROTEM/TEG) for monitoring perioperative haemostasis in major orthopaedic surgery and neurosurgery. 2C

- Visceral and transplant surgery
Despite PT, aPTT and INR indicating coagulopathy in chronic liver disease (CLD), global coagulation tests (thrombin generation and TEG/ROTEM) suggest that haemostasis is balanced in stable CLD. C

We recommend the use of perioperative coagulation monitoring using ROTEM/TEG for targeted management of coagulopathy. 1C

We recommend antifibrinolytic drugs for treatment of fibrinolysis (evident from microvascular oozing or TEG/ROTEM clot lysis measurement) and not for routine prophylaxis. Marginal grafts (e.g. donation after cardiac death) increase the risk of fibrinolysis postreperfusion. 1C
References


Upcoming Events

2014 Meeting Schedule

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<td>Jan 14-18 2014</td>
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<td>STS (Soc of Thoracic Surgeons)</td>
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<td>CNMC ECMO (Childrens Nat’l Med Cntr Symp on ECMO)</td>
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<td>NorAm Severe Bleeding Management Symp</td>
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<td>MHSRS (Military Health Sci Rsrch Symp)</td>
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<td>AAST (Amer Assoc Surgery of Trauma)</td>
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<td>SABM (Soc Advancement of Blood Mngmnt)</td>
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<td>NYSSA PGA (NY Anesthesiologists Post Grad Assembly)</td>
<td>Dec 12-16 2014</td>
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