CRITICAL CARE

COMMENTARY

The STOP the Bleeding Campaign

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Abstract

According to the World Health Organization, traumatic injuries worldwide are responsible for over 5 million deaths annually. Post-traumatic bleeding caused by traumatic injury-associated coagulopathy is the leading cause of potentially preventable death among trauma patients. Despite these facts, awareness of this problem is insufficient and treatment options are often unclear. The STOP the Bleeding Campaign therefore aims to increase awareness of the phenomenon of post-traumatic coagulopathy and its appropriate management by publishing European guidelines for the management of the bleeding trauma patient, by promoting and monitoring the implementation of these guidelines and by preparing promotional and educational material, organising activities and developing health quality management tools. The campaign aims 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.

Introduction

Injuries worldwide cause more than 16,000 deaths per day [1]. Bleeding is a leading cause of death following traumatic injury for those patients who are admitted to hospital, and trauma-associated coagulopathy increases both the risk and severity of bleeding. At least 20% of severely injured patients (Injury Severity Score ≥16) are already coagulopathic upon arrival in the emergency room [2-4], but awareness of this problem is low, leading to late recognition and delayed treatment of coagulopathy. This lack of awareness may cause harm to our patients, because the coagulopathy associated with traumatic injury contributes significantly to secondary injury and results in a several-fold increase in morbidity and mortality [5,6]. Moreover, diagnostic and treatment options are often unclear and not well investigated.

Inspired by the success of two other medical awareness campaigns – the Anti-Obesity Campaign created in 1999 [7] and the Surviving Sepsis Campaign launched in 2002 [8] – a multidisciplinary, pan-European group of experts with specialties in surgery, anaesthesia, emergency medicine, intensive care medicine and haematology are now in the process of launching a campaign to counteract preventable deaths from uncontrolled bleeding following traumatic injury. This task force, including representatives of relevant European professional societies – the European Society of Anaesthesiology, the European Society of Intensive Care Medicine, the European Shock Society, the European Society of Trauma and Emergency Surgery and the European Society for Emergency Medicine – published a review article [9] and developed guidelines for the management of the bleeding trauma patient, which have been updated at 3-year intervals [10-12]. The group believes that an active campaign to improve awareness of traumatic coagulopathy will help to ensure that guideline recommendations are universally implemented.

Aim and acronym of the STOP the Bleeding Campaign

The STOP the Bleeding Campaign aims to reduce morbidity and mortality from bleeding following traumatic injury by implementing a programme to support haemostatic resuscitation that includes clinical practice guidelines, patient management bundles, educational tools and adherence control measures to ensure the early recognition and treatment of bleeding and traumatic coagulopathy. The goal of the campaign is to reduce the number of patients who die within 24 hours after arrival in hospital due to exsanguination by a minimum of 20% within 5 years.

The acronym STOP comprises the following elements: Search for patients at risk of coagulopathic bleeding;

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Treat bleeding and coagulopathy as soon as they develop; Observe the response to interventions; Prevent secondary bleeding and coagulopathy.

Search for patients at risk of coagulopathic bleeding

The early recognition of bleeding and coagulopathy requires awareness of the phenomenon. Although the Advanced Trauma Life Support programme addresses the circulatory problem during the primary survey and suggests that bleeding sources should be sought if shock is present [13], the issue of coagulopathy associated with traumatic injury is not well addressed at present. The STOP concept specifically addresses three important aspects of coagulopathic bleeding: rapid detection of all relevant bleeding sources; estimation of blood loss, risk of ongoing haemorrhage and need for massive transfusion; and targeted screening for and monitoring of coagulopathy upon arrival in hospital and intermittently thereafter.

Treat bleeding and coagulopathy as soon as they develop

Bleeding should be stopped using surgical or other means as quickly as possible. Damage control surgery should be applied to patients in shock, including packing of the abdomen in haemorrhagic patients, application of external fixators to long bone fractures and an attempt to limit operation times to ≤90 minutes per intervention. Aggressive treatment of coagulopathy should be implemented simultaneously, including the early administration of tranexamic acid and the use of blood products according to evidence-based clinical practice guidelines.

Observe the response to interventions

After treatment, the response to intervention should be observed. Important variables to be considered include the surgeon's interoperative judgement, laboratory tests, thrombelastometric assessment and the necessity of continued blood product administration. The vital status – especially blood pressure, pulse rate, lactate and urinary output – should also be evaluated.

Prevent secondary bleeding and coagulopathy

Especially important is the avoidance of secondary coagulopathy. Measures may include the use of damage control surgery rather than primary definitive surgery in patients in shock and the prevention of all risk factors that trigger haemostatic disorders, including hypothermia and acidosis.

Main action points for implementation

To achieve these goals, several important action points must be undertaken in parallel. The campaign must be visible not only for researchers but also for clinicians involved in the treatment of bleeding trauma patients. Although published national and international guidelines that reflect the current evidence and a scientific evaluation of state-of-the-art diagnostic and treatment options and that identify areas which require further research are helpful to guide the clinician in the treatment of the bleeding trauma patient, the translation into clinical practice represents a challenge for busy clinicians, particularly in an emergency setting. The campaign therefore aims to develop and test diagnostic and interventional patient management bundles to aid in the learning and implementation process, as demonstrated during the Surviving Sepsis Campaign [14].

Evidence from the Surviving Sepsis Campaign has also shown that the adherence to the management bundles must be monitored and – more importantly – is associated with an increase in survival [15]. We therefore aim to create a technical tool that can be used to monitor and document institutional adherence to patient management principles in national or international databases. If possible, these databases should be aligned to permit comparative effectiveness research.

In addition, awareness and implementation of the principles represented by the STOP the Bleeding Campaign should be supported by educational programmes, and adaptation of the guiding principles to the local situation in each institution and the effectiveness of the programme should be evaluated using validated tools on a periodic basis.

Support and funding

The experts initiating the STOP the Bleeding Campaign request the support of European professional societies, political bodies, national and international health and funding organisations as well as pharmaceutical and device manufacturers. If these diverse groups recognise and accept the challenge presented by the bleeding trauma patient and enable a global campaign to induce clinicians involved in the treatment of the trauma patient to embrace evidence-based management principles, it will be possible to decrease mortality due to exsanguination in the coming years.

Abbreviations

STOP, Search for patients at risk of coagulopathic bleeding, Treat bleeding and coagulopathy as soon as they develop, Observe the response to interventions, Prevent secondary bleeding and coagulopathy.

Competing interests

In the past 5 years BB has received honoraria for consulting from Novo Nordisk, CSL Behring and Sangart. In the past 5 years VC has received honoraria for consulting or lecturing from B. Braun, Fresenius, Novo Nordisk and MSD; he has received research grant funding and institutional support from Charles University in Prague (Czech Republic). In the past 5 years TJC has received research grant funding from the National Institute of Health Research and the College of Emergency Medicine; he has received institutional support from the University of Leicester. In the past 5 years JD has received institutional support from Assistance Publique Hopitaux de Paris and Paris-Sud University. In the past 5 years EF-M has received honoraria for consulting from

Sangart and CSL Behring; he is a member of the Medical Advisory Board of Pulsion BJH. In the past 5 years DF has received honoraria for consulting or lecturing from Abbott, Sanofi Aventis, Servier and ViforPharma, institutional support from Abbott, Edwards Lifescience, Infomed Fluids, Medtronic, Nycomed, Pfizer, Servier, Siramed and ViforPharma, and travel grants from B. Braun, Fresenius Kabi and GlaxoSmithKline. In the past 5 years BJH has received no personal pecunary benefit from pharmaceutical companies, but donated all honoraria from lecturing to charity; she was a joint investigator on a research study funded by Sanofi. BJH does not sit on advisory boards to pharmaceutical companies, but sits on an advisory board for Haemonetics. In the past 5 years RK has received honoraria for consulting and lecturing from Eli Lilly and Amgen. In the past 5 years MM has received honoraria for consulting or lecturing from Novo Nordisk, CSL Behring and Biotest; he has received research grant funding and institutional support from the Private University Witten-Herdecke (Germany); he has served as a Medical Advisory Board member for CSL Behring. In the past 5 years GN has received honoraria for consulting and lecturing from CSL Behring and honoraria for lecturing from Fresenius Kabi; he has received a research grant from Sangart and a research grant (institutional research) from Novo Nordisk. In the past 5 years EN has received honoraria for consulting or lecturing from BIOMET, Pfizer, QRx Pharma, MSD, Grünenthal and Therabel; he has received research grant funding from BMBF, DFG, Else-Kröner Foundation, and different societies and has received institutional support from KCI, Pfizer, Mundipharma, BIOMET and Janssen. In the past 5 years YO has received honoraria for consulting or lecturing from LFB and CSL Behring. In the past 5 years LR has been involved in educational courses on bleeding control supported by Baxter. In the past 5 years RR has received honoraria for consulting or lecturing from CSL Behring, Novo Nordisk, Bayer Healthcare and Air Liquide; he has received research grant funding from CSL Behring, Boehringer Ingelheim, Air Liquide, Biotest, Nycomed and Novo Nordisk. In the past 5 years AS and J-LV have no competing interests to declare.

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