Management of Massive Bleeding

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DISCLOSURE

Scientific Advisory Board
CSI Behring
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Introduction

What’s new in management MB

- **Trauma**
- Post cardiac surgery
- Gyne/Ob catastrophes
- GI bleeding
- Post operative disasters

Some common principles
Introduction

1. Trauma is common
2. Bleed a lot (1st hospital death/blood use)

Sauaia et al J Trauma 1995;38:185
Management of massive bleeding

Two types of bleeding

Mechanical - surgery  Coagulopathic - blood
Management of massive bleeding

Coagulopathy 21st Century

Until 2003 (Brohi)

- Bleeding
- Dilution
- Coagulopathy
  - Hypothermia
  - Acidosis
  - Etc; etc

After 2003

- Endogenous
- Early (min.)
- 1-4 patients
- aPC
- tPA
- 3x mortality
Coagulopathy 21st Century

Complex coagulopathy

1/3 patients – “normal”

1/3 hypocoagulable

1/3 hypercoagulable

3-6% hyper fibrinolytic
Pathophysiology

- Endogenous & early
- Shock + tissue destruction
- Complex (*multiple defects*)

a. Anticoagulation = APC
b. Hyper fibrinolysis = tPA
c. Low fibrinogen
d. Dilution, temperature, acidosis
Management

What’s new in management MB in the 21st century
Management

1. Formula “one size fits all”
DCR or 1:1:1

everyone is \(\text{will be}\) coagulopathic
everyone needs plasma \((\pm \text{platelet})\)
RBC + plasma early \((\text{thawed})\)
limit crystalloids
no lab required
Management

1. Formula; DCR or 1:1:1

TRFL study *CMAJ* 2013;185(12)
feasibility – no clinical benefit
ARDS; mortality *(p.053)*
wastage
inappropriate transfusion

*Most used North America*
Management

2. Fibrinogen-based resuscitation
Rourke J Thromb Haemost 2012

low levels = bleeding + mortality
low arrival – 1st to drop
continues drop
fluids, acidosis, temp, fibrinolysis
replacement corrects

Mostly Europe (ROTEM+FgC)
≠ mortality
Management

3. CRASH 2 *(Lancet 2010; 2011)*

20,211 patient RCT

significant hemorrhage *(or at risk)*

reduced death *(<3h)*

Conclusions:

1. Reduces death within 3h
2. Safe, inexpensive, available
Management of massive bleeding

Management

4. Massive transfusion protocols
*Cotton JTrauma 2009 67:1004*

Predetermined, coordinated, multidisciplinary
Military: implement 1:1 BUT no drop mortality
Civilian: fail implement 1:1 BUT mortality drops

Conclusions:
- MT protocols = improve survival
- Organizing = difference is the protocol
Ideal Management

**SOME** common principles

Trauma

Post cardiac sx

*Karkouti, ROTEM, platelets, fibrinogen*

Gyne/Ob

*fibrinogen; TXA*

GI bleeding

*vit K*

Post operative
Management of massive bleeding

Best Management


Massive transfusion protocol

1. Stop the bleeding
2. Start formula *(1:1 RBC:FFP)*
3. Tranexamic acid *(1g/10min then 1g/8h)*
4. Switch lab-guided resuscitation
   - *rapid lab panel*
   - *TEG/ROTEM*
Thank you