North West Regional Transfusion Committee

Major Haemorrhage in Trauma

North West Regional Audit

Abbreviated Report

February – April 2018

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Sincere apologies for the delay in the issue of this report. When made available, the results of the 2018 audit were presented verbally to the Regional Transfusion Committee. We acknowledge practice may have changed since the data was collected.

Contents

Abbreviations

BSH	British Society of Haematology
FFP	Fresh frozen plasma
HT	High titre
MH	Major haemorrhage (*or* massive haemorrhage)
MTC	Major Trauma Centre
O RhD negative	Group O Rh D negative
O RhD positive	Group O Rh D positive
NICE	The National Institute for Health and Care Excellence
NHS	National Health Service
NPSA	National Patient Safety Agency
PGD	Patient Guided Directive
RBC	Red blood cells
RRR	Rapid Response Report
SD FFP	Solvent detergent treated fresh frozen plasma
SHOT	Serious Hazards of Transfusion
TARN	Trauma Audit and Research Network
TXA	Tranexamic Acid

Executive Summary

Introduction

The Major Trauma Network peer review programme requires regular review of the management of major haemorrhage associated with trauma. A survey-based assessment of major haemorrhage management across the North West of England was undertaken in 2018.

Background

The management of major haemorrhage (MH) requires a rapid coordinated response following best practice recommendations as outlined in recent studies and guidelines. In 2010, the NPSA ref highlighted 11 deaths and 83 cases of patient harm secondary to the delays in the provision of blood. A Rapid Response Report was issued with mandatory requirements for Trusts in relation to the transfusion of blood components in an emergency.

NICE released guidance on the management of trauma, including haemorrhage[1]. The BSH released their guidelines on major haemorrhage in 2015[1]. These 2 documents have considered all the available data on major haemorrhage, including seminal studies such as CRASH-2[1] and the PROPPR[2] (Pragmatic, randomized, optimal platelet and plasma ratios) randomised controlled trial to formulate a set of guidelines and recommendations.

BSH Haematological Management of Major Haemorrhage guidelines (2015)

Key recommendations:

1. Plasma is to be given to cases of MH related to trauma in a 1:1 ratio with red cells
2. Major trauma centres consider stocking pre-thawed plasma for cases of MH in order to facilitate this. Note: this was made more practically feasible from April 2016 as the shelf-life of thawed plasma was extended to 5 days when stored at 4^{o}C
3. Access to 24-hour cell salvage to be available in all trauma, cardiac, vascular and obstetric centres
4. Where the patient's group is unknown, group A HT negative plasma should be given in order to conserve supplies of group AB

5. Group O D positive blood can be used for men and women of non-child bearing potential (>50 years) where the group is unknown, conserving O D negative blood for females of child-bearing potential

NICE guideline [NG39] Major trauma: assessment and initial management (2016)

Key recommendations:

1. A definition of major haemorrhage should be adopted that incorporates physiological criteria including the patient's haemodynamic status
2. Tranexamic acid to be administered within 3 hours of trauma for all cases of confirmed or suspected major haemorrhage. This guidance was based on data from the CRASH-2 study which showed a 9% reduction in mortality associated with the use of this anti-fibrinolytic agent

The audit was devised to assess compliance with locally agreed key performance indicators developed from the national guidance.

Aims

The aim of the audit was to assess the compliance of hospitals across the North West network to the network agreed standards, across a number of key parameters. The results are compared with similar audits conducted in 2014 and 2016.

Organisational Audit Standards

- 100% of trusts should provide a definition of major haemorrhage
- 100% of trusts should base their major haemorrhage protocol on the NW RTC guidelines
- In 100% of trusts, the patients should be able to receive tranexamic acid pre-hospital in cases of potential major haemorrhage associated with trauma
- 100% of trusts should have a dedicated means of activating the major haemorrhage protocol
- 100% of trusts should have cell salvage available, especially major trauma centres
- 100% of Trusts should incorporate the use of O D negative red cells in protocol
- 100% Trusts should specify use of O D positive red cells in adult males and females of non-child-bearing potential
- 100% of Major Trauma Centres should stock pre-thawed FFP
- 100% of trusts should report all incidents involving delays or problems with the provision of blood in an emergency to SHOT
- 100% of trusts should run major haemorrhage drills

Methods

All NHS Trusts within the North West region were invited to participate in the regional audit. Organisational survey data was collected using an online system, SnapSurveys© (appendix 1) sent to all Trusts in March and April 2018.

Organisational Survey Results

Standard	Regional Average 2018	Regional Average 2016	Regional Average 2014
1. 100% of trusts should provide a definition of major haemorrhage	93% (14/15)	100%	95%
2. 100% of trusts should base their major haemorrhage protocol on the NW RTC guidelines	93% (14/15)	100%	No data
3. In 100% of trusts, the patients should be able to receive tranexamic acid pre-hospital in cases of potential major haemorrhage associated with trauma	100% (15/15)	84%	42%
4. 100% of trusts should have a dedicated means of activating the major haemorrhage protocol eg. 2222 call to switchboard, direct call to the lab etc	100% (15/15)	100%	No data
5. Trusts should have cell salvage available, especially the major trauma centres	47% (7/15)	89%	89%
6. Where available, cell salvage should be available 24 hours a day	71% (5/7)	26%	39%
7. 100% of Trusts should incorporate the use of O D negative red cells in protocol	100% (15/15)	89%	79%
8. 100% Trusts should specify use of O D positive red cells in adult males and females of non-child-bearing potential***	93% (14/15)	37%	No data
9. Major trauma centres should stock pre-thawed FFP	40% (2/5)	0%	No data
10. All incidents involving delays in the provision of blood in an emergency should be reported to SHOT	73% (11/15)	79%	83%
11. 100% of trusts should run major haemorrhage drills	87% (13/15)	74%	50%

Discussion

The results from this organisational audit are comparable to the last audit in 2016 with notable improvements in key areas. The sample size on this occasion was 15 hospitals rather than the 19 hospitals in the 2016 audit as some Trusts did not provide data to incorporate into this audit.

One Trust in the region reported that they did not have a definition of major haemorrhage and reported that their local major haemorrhage guidelines were not based on NW RTC guidelines which lead to a reduction in compliance in this area.

A significant improvement in the availability of tranexamic acid in the pre-hospital setting for major haemorrhage has been demonstrated since data was first collected in 2014. At this time, only 42% of patients received this, in 2018 this stood at 100%. This reflects a considerable change in practice across the region underpinned by the availability of tranexamic acid for traumatic haemorrhage on PGD for the North West Ambulance Service. Further details surrounding tranexamic acid use including those who go on to receive the 1g infusion after the initial bolus dose will feature in the next audit.

In the 2018 audit, the standard changed to read that 100% of hospitals should have access to a cell salvage service to respond to haemorrhage, rather than just the Major Trauma Centres. This likely reflects the observed fall in compliance from 89% in 2016, to 47% in 2018. Of the five MTC in the North West, three (60%) reported that they did have access to a 24-hour cell salvage service.

Of note, it was reported that there has been a significant improvement in the compliance of hospitals to the policy of providing O D positive blood in major haemorrhage to adult males and women of non-child bearing age. This increased from 37% in 2016 to a *reported* 100% in 2018. This result is likely not to reflect true practice as subsequent discussions within the regional meetings has demonstrated that sites have not fully implemented this national recommendation.

An improvement in the availability of pre-thawed FFP was reported in Major Trauma Centres from 0% in 2016 to 40% in 2018. This number has subsequently increased since the 2018 audit data was collected. It is predicted that all but one of the region's

MTCs will have implemented the use of pre-thawed FFP to promptly respond to traumatic haemorrhage in subsequent audits.

The number of hospitals reporting incidents to SHOT regarding delays in provision of blood components in major haemorrhage reduced from 79% in 2016 to 73% in 2018. The reasons for this are not clear and will form the basis of discussion at regional transfusion committee meetings.

Overall, the North West achieved >95% compliance in three of the eleven standards, with compliance being <74% in two areas.

Summary of Recommendations

- Centres should review their Major Haemorrhage Policy and ensure it is based on NW RTC guidance.
- All sites should have a definition of major haemorrhage.
- Major trauma centres should develop strategies to allow the provision of pre-thawed FFP to respond promptly to major haemorrhage.
- Component transfusion in traumatic major haemorrhage should include red cells and plasma in a 1:1 ratio.
- All sites should review current practice regarding the implementation of O D positive red cells to males over 18 and women of non-child bearing potential *where appropriate.*
- All sites responding to major haemorrhage relating to trauma, cardiac, vascular and obstetrics should have access to 24-hour cell salvage service.
- All sites should undertake drills as part of their education and training in major haemorrhage.
- All instances of delays regarding transfusion in major haemorrhage should be reported to SHOT.

Note: Due to delay in the issue of this report, an action plan will not be issued as this will be based on 2018 results and not current practice. Re-audit is due in Spring 2020 and following the publication of the National Comparative audit on Major Haemorrhage (2018, *currently pending*).

Appendix 1 – Assurance levels for Organisational Audit

For each clinical audit undertaken, an assurance rating is reported for each standard measured.

Step 1:
Each standard is given a rating of red, amber or green depending on how high, or low, it measured.

Calculation of individual ratings against standard	
Colour	Standard % measure
	95% and above
	75% to 94%
	74% and below

References

[1]National Institute for Health and Clinical Excellence (NICE) (2016) Major trauma: assessment and initial management. [Online]. Available at: https://www.nice.org.uk/guidance/ng39. [Last accessed: 20th January 2020].

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[3] CRASH-2 trial collaborators, Shakur, H., Roberts, I., Bautista, R., Caballero, J., Coats, T., Dewan, Y., El-Sayed, H., Gogichaishvili, T., Gupta, S., Herrera, J., Hunt, B., Iribhogbe, P., Izurieta, M., Khamis, H., Komolafe, E., Marrero, M.A., Mej_ıa-Mantilla, J., Miranda, J., Morales, C., Olaomi, O., Olldashi, F., Perel, P., Peto, R., Ramana, P.V., Ravi, R.R. & Yutthakasemsunt, S. (2010)
Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial. The Lancet, 376, 23–32.

[4] Holcomb, J.B., Tilley, B.C., Baraniuk, S., Fox, E.E., Wade, C.E., Podbielski, J.M., del Junco, D.J., Brasel, K.J., Bulger, E.M., Callcut, R.A., Cohen, M.J., Cotton, B.A., Fabian, T.C., Inaba, K., Kerby, J.D., Muskat, P., O'Keeffe, T., Rizoli, S., Robinson, B.R., Scalea, T.M., Schreiber, M.A., Stein, D.M., Weinberg, J.A., Callum, J.L., Hess, J.R., Matijevic, N., Miller, C.N., Pittet, J.F., Hoyt, D.B., Pearson, G.D., Leroux, B. & van Belle, G.; PROPPR Study Group. (2015) Transfusion of plasma, platelets, and red blood cells in a 1:1:1 vs a 1:1:2 ratio and mortality in patients with severe trauma: the PROPPR randomized clinical trial. JAMA, 313, 471–482.