Use of ROTEM in Massive Obstetric Haemorrhage – a new service for Royal Jubilee Maternity Hospital

Dr Sara Henry (Clinical Fellow in Obstetric Anaesthesia), Dr Rebecca Colleran (ST4 Anaesthesia), Dr Yasmin Nawaz (Consultant Anaesthetist)
Royal Jubilee Maternity Hospital, Belfast

Background

Massive Obstetric Haemorrhage (MOH) is a leading direct cause of maternal death in the UK. MBRRACE reports have highlighted the problem of slow processing times for coagulation tests delaying blood product administration [1]. Use of point of care coagulation testing (POCCT) such as ROTEM is recommended by the AAGBI, OAA and RCOA [2] as a tool to speed up the recognition and treatment of coagulation disorders in MOH. We compare the management of patients with MOH in our unit before and after the introduction of ROTEM in February 2023.

Methods

- Service evaluation of MOH management comparing pre-ROTEM (2021) with post-ROTEM (March 2023 – present, 13 months) data
- Focusing on cases requiring activation of Massive Transfusion Protocol (MTP)
- Retrospective data collection including products transfused, QBL and patient outcomes
- Analysis of compliance with ROTEM-guided algorithm
- Survey of experience with ROTEM, RJMH, April 2024 (trainee/consultant anaesthetists)
- Approval from Belfast Trust Governance Committee.

Results

Over a 13 month period there have been 134 ROTEM tests performed on 112 patients (19% of patients with a QBL >1L). Fourteen (61%) of 23 patients with at least one abnormal result were treated appropriately according to the algorithm and this adherence to the algorithm increased with time. Post ROTEM introduction, there were 19 cases of MOH which required MTP activation. Of these, 7 patients received fibrinogen concentrate (FC) compared with none in 2021. Transfusion of packed red cells and platelets was reduced and FFP use fell from 2.3 to 1.1 units per patient. The average time for a laboratory coagulation result was 1hr 47 mins (43mins – 3hrs 30mins). An anonymous survey of ROTEM experience in RJMH gathered 17 responses from 23 anaesthetists. Sixteen (94%) respondents agreed or strongly agreed that ROTEM was easy to use and 100 % agreed or strongly agreed that the algorithm was easy to use and that ROTEM is a useful tool to help manage MOH.

Table 1 showing comparison of product use, QBL and patient outcomes in MTP activated MOH before and after the introduction of ROTEM

	Pre ROTEM 2021 (19) Units/patient (Total)	Post ROTEM 2023 (19) Units/patient (Total)
Cryoprecipitate	0.4 (8)	0.3 (7)
FC	0 g (0 g)	1.5 g (30 g)
FFP	2.3 (43)	1.1 (21)
Platelets	0.3 (6)	0.1 (2)
Packed Red Cells	2.8 (54)	2 .2(43)
QBL (range)	1.5 – 7.4 L	1 – 6 L
Hysterectomy	3	2
ICU Admission	1	2

Discussion

Implementation of ROTEM with actionable results within 15 minutes has allowed faster recognition and targeted management of coagulation in the face of slow laboratory results. This has been achieved by measures including the use of a ROTEM-guided MOH algorithm and fibrinogen concentrate available on site. Our data shows increased use of FC with decreased FFP use in MTP activated cases. Feedback from anaesthetists using ROTEM has been very positive however the training of rotating anaesthetists and new midwives remains an ongoing challenge.

Major Obstetric Haemorrhage - ROTEM Protocol
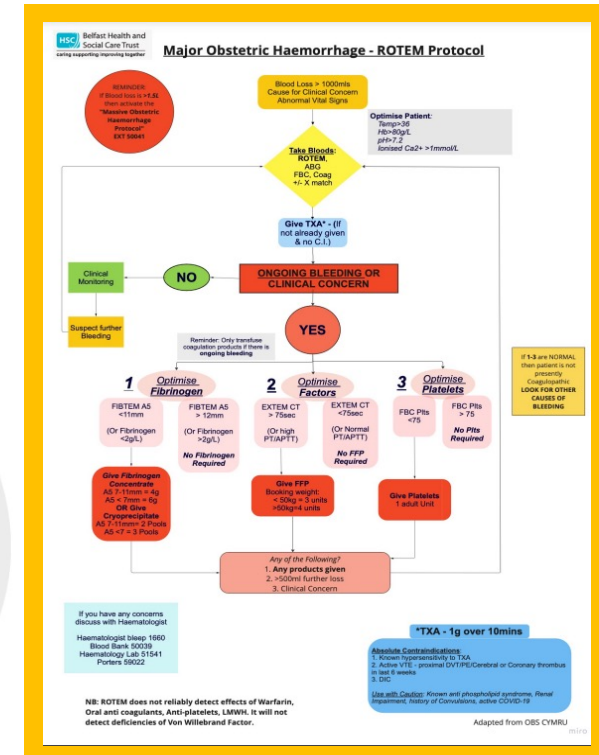
References

1. Knight M, Bunch K, Tuffnell D et al on behalf of MBRRACE-UK. Saving Lives, Improving Mothers' Care - Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2017-19. Oxford: National Perinatal Epidemiology Unit, University of Oxford 2021
2. Bamber J, Lucas N, Riley M et al. Guidelines for the Provision of Anaesthesia Services (GPAS). Chapter 9. Guidance on the Provision of Anaesthesia Services for Obstetric Anaesthesia Services 2022. Guideline 2.7.