

A00 ROTEM Sigma vs Delta: a comparison of results obtained in non-pregnant participants

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Introduction: ROTEM thromboelastometry is a point of care (POC) test of coagulation, which has been evaluated for use on delivery suites during postpartum haemorrhage.¹ Until 2015 only ROTEM delta analysers were available. The delta requires multiple manual steps to run a sample, leading to the possibility of user error as well as requiring significant time outlay from the operator. A new device is now available, the ROTEM Sigma. This uses an automated cartridge system and requires less technical input to perform a test. Algorithms in obstetrics have been, to date, based on results from the delta.² A comparison of the two analysers was performed to determine whether results were comparable and if the same algorithm could be used.

Methods: As part of a registered quality improvement programme in the management of postpartum haemorrhage (PPH), the delta and sigma ROTEM machines were compared before the upgraded device was placed into clinical practice. Paired venous blood samples were taken from 30 healthy, consented, non-pregnant volunteers and tested on ROTEM sigma and delta analysers. Fibtex and Extex tests were performed. A sample size of 30 was considered adequate to find a normal range. Paired student t-tests were used to compare results and were performed using Microsoft Excel.

Results: Fibtex A5 results were similar ($P=0.36$) with a mean \pm SD of 15.1 ± 4.0 mm on the delta, compared to 14.8 ± 3.3 mm on the sigma. Extex clotting time (CT) results were both statistically and clinically significantly different, with lower results obtained on the sigma analyser. The delta Extex CT measured 62.4 ± 6.2 s compared to the sigma 56.8 ± 7.7 s, ($P<0.001$). The Extex A5 results were also significantly different, with a mean \pm SD of 51.8 ± 5.0 mm on the delta compared to 43.2 ± 5.4 mm on the sigma ($P<0.001$).

Discussion: Current algorithms for the use of ROTEM in PPH are based upon results obtained on the delta analyser. Although the ROTEM sigma appears to produce comparable Fibtex A5 results, the Extex results, particularly CT, appear to be lower. Based on recent RCOG guidance, we suggest using an abnormal CT (when bleeding) to consider therapeutic coagulation intervention.³ The CT time based on this evaluation should be considered abnormal if >75 seconds, compared to 80 seconds previously used in delta algorithms.² Our new algorithm will use the new values but further experience using the ROTEM sigma device in clinical practice during PPH is vital to understand the comparison with ROTEM delta.

References

1. Collins PW, Lilley G, Bruynseels D, et al. Fibrin-based clot formation as an early and rapid biomarker for progression of postpartum hemorrhage: a prospective study. *Blood* 2014;124:1727-36.
2. Mallaiah S, Barclay P, Harrod I, et al. Introduction of an algorithm for ROTEM-guided fibrinogen concentrate administration in major obstetric haemorrhage. *Anaesthesia* 2015;70:166-75.
3. Mavrides E, Allard S, Chandraran E, et al. Prevention and management of postpartum haemorrhage. *BJOG* 2016: e1-44.