

FIBTEM A5 correlates well with laboratory Clauss fibrinogen results in the obstetric population



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- Local PPH policy uses ROTEM when measured blood loss $\geq 1000\text{ml}$ to guide blood product transfusion.
- Paired ROTEM and Clauss fibrinogen levels were observed over a 9 month period. 42 paired samples were positively correlated ($p < 0.001$).
- ROTEM is a valid point of care test and results are available within 10 minutes.
- Routine use can improve PPH management through rapid correction of coagulopathy.

The aim of this quality improvement project was to determine whether Fibtrem A5 results accurately correlated with the lab Clauss fibrinogen levels in the maternal population.

Introduction

Rotational thromboelastometry (ROTEM), is a point-of-care technology that assesses coagulation from initial clot formation to clot lysis at the patient's bedside.

Thromboelastometry has been demonstrated to be a fast and accurate way of producing actionable values for fibrinogen levels during postpartum haemorrhage (PPH)⁽¹⁾.

The FIBTEM assay is one of many that can be run on the ROTEM sigma machine. Coagulation is activated by a small amount of tissue thromboplastin (tissue factor). The addition of cytochalasin D, works as a platelet blocking substance. This allows the FIBTEM assay to assess fibrinogen levels and fibrin polymerisation in a functional way.

Fibrinogen is an important biomarker in predicting severity of PPH⁽²⁾.

- Fibrinogen $< 2\text{ g/L}$ is associated with transfusion of > 7 units of blood products, prolonged bleeding and increased HDU length of stay⁽³⁾.
- For each gram reduction in fibrinogen, PPH risk increases X 2.63⁽⁴⁾.

As part of quality improvement work our department incorporated a ROTEM sigma machine into PPH management using the OBS Cymru protocol⁽⁵⁾. Transfusion of fibrinogen concentrate or cryoprecipitate is then based on algorithmic interpretation of FIBTEM A5 results.

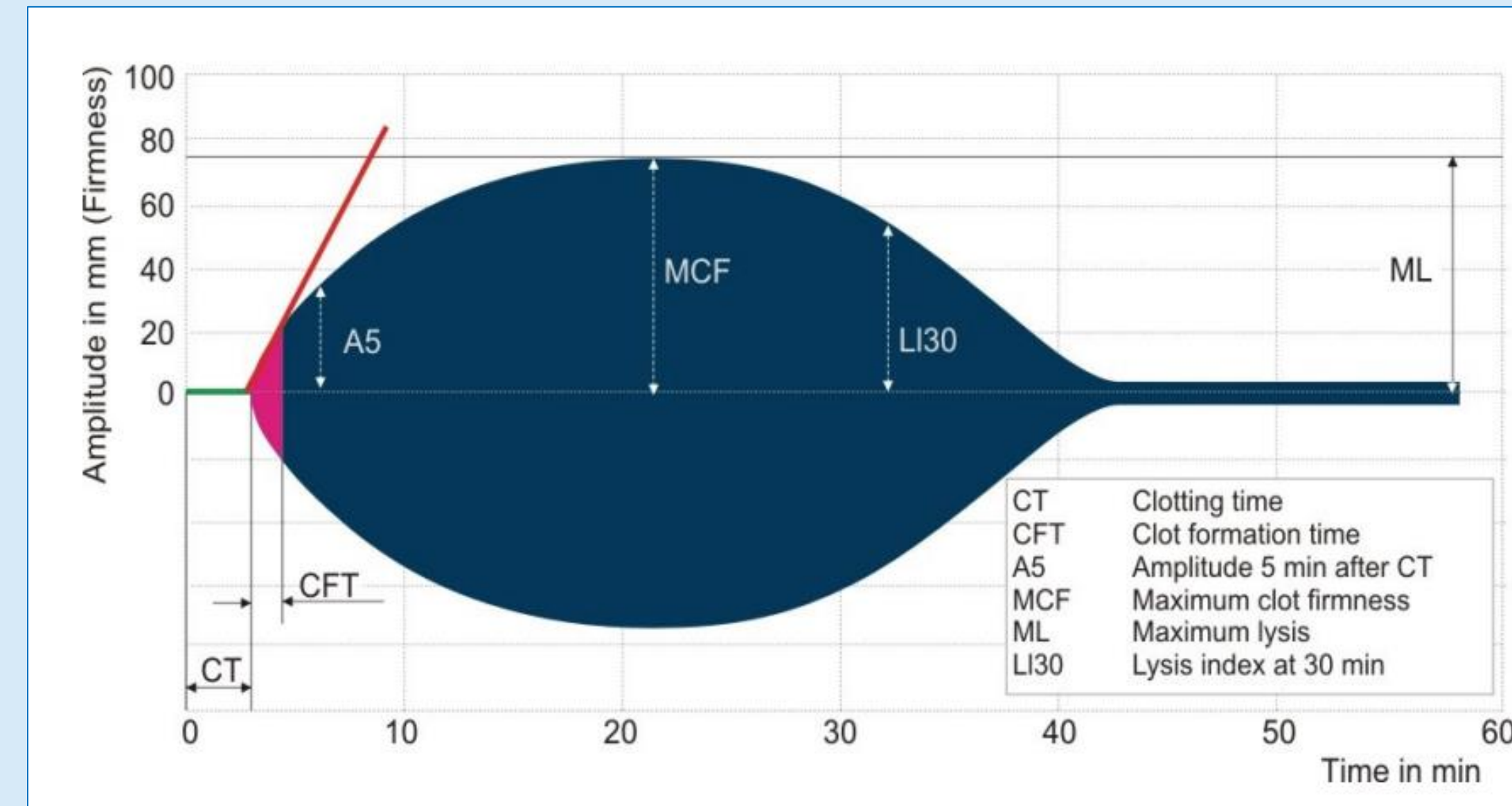
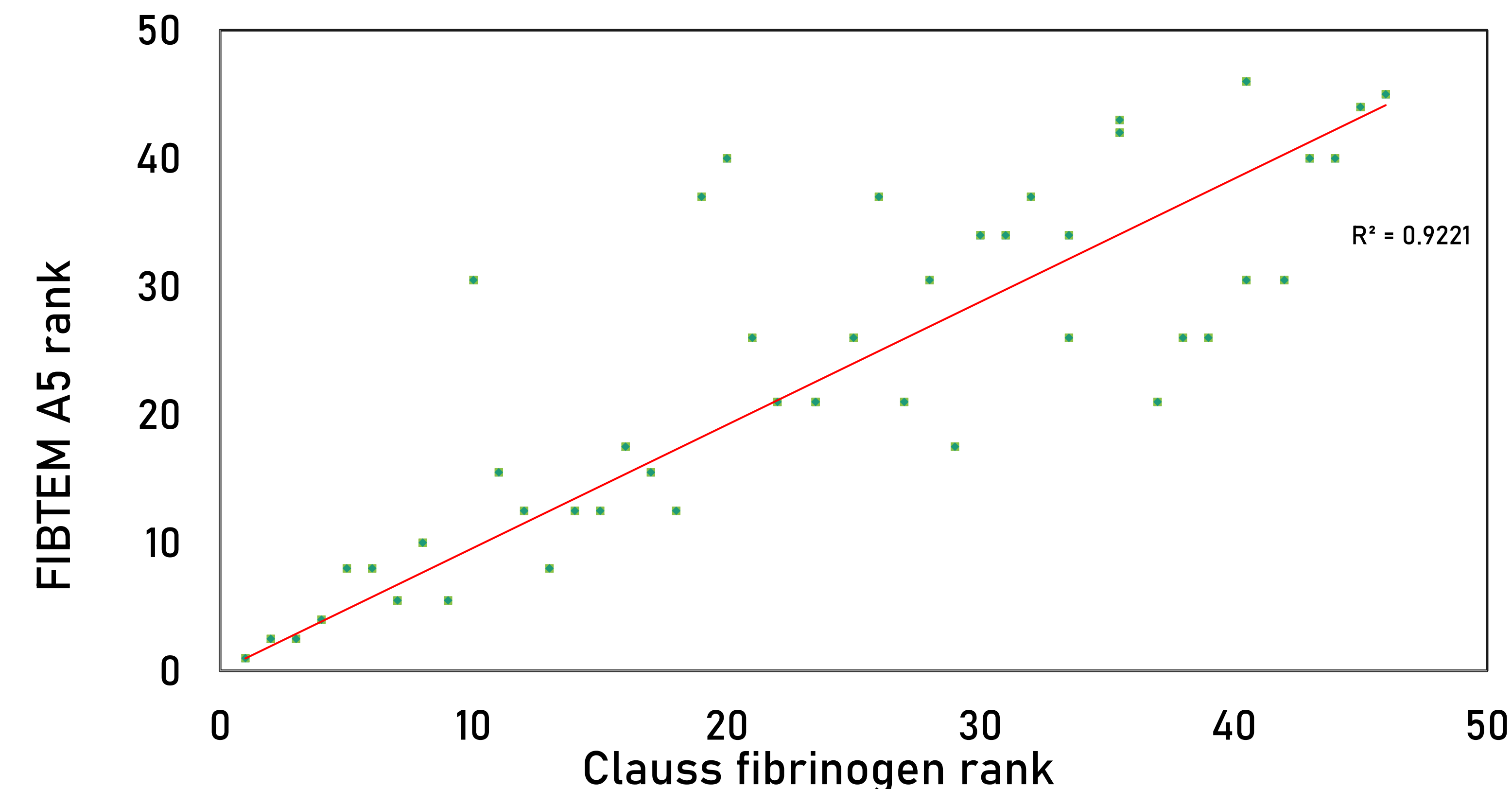


Figure 1. ROTEM® thromboelastometry parameters and scaling.



Spearman's Rank demonstrates strong correlation between point of care FIBTEM A5 testing and laboratory Clauss fibrinogen values. 46 paired samples, $R_s = 0.84$ ($p < 0.001$).

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Method

In line with the locally adopted PPH protocol, paired blood samples were taken after identifying measured blood loss of $\geq 1000\text{ml}$. One sample was tested using the ROTEM machine at the point of care and the other sent to the hospital laboratory for Clauss fibrinogen assay.

Values for FIBTEM A5, the amplitude of the thromboelastogram (representing clot firmness) 5 minutes after the initiation of clotting (Fig. 1) and Laboratory fibrinogen were collected manually.

Values encompassing a 9-month period were subsequently reviewed and interpreted using a Spearman (R_s) test to determine correlation using Microsoft Excel software.

Results

Between May 2022 and January 2023, 182 ROTEM samples were tested. Of these, 46 had a paired sample sent for Clauss fibrinogen testing.

The observed correlation between Clauss fibrinogen and FIBTEM A5 was $R_s = 0.84$ ($p < 0.001$) for the 46 paired samples available. Results were available within 10 mins of blood draw.

Discussion

Point of care testing provides a means of expediting actionable blood results⁽²⁾. Our review has demonstrated a high degree of correlation between lab Clauss fibrinogen and the Fibtrem A5 values.

A strength of our review is that we were able to prospectively study ROTEM® measurements performed in women experiencing postpartum haemorrhage. The review was however limited by a small sample size, particularly fibrinogen levels below 2g/L .

This **early identification allows more rapid initiation of treatment**. We hope that this will in turn reduce maternal morbidity.