

Management of coagulopathy induced by postpartum haemorrhage (PPH) in a COVID positive patient with liver cirrhosis and portal hypertension utilising thromboelastography (TEG).

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Introduction

Tipping of a normal haemostatic balance in any direction can result in either thrombosis or bleeding. Influence of liver cirrhosis and COVID-19 on coagulation can compound complexity in the management of coagulopathy after PPH and the decision on post-operative thromboprophylaxis. TEG can be a useful adjunct to routine laboratory based coagulation tests to formulate a strategy.

Case report

A 26-year-old lady with a history of cryptogenic liver cirrhosis, portal hypertension, splenomegaly and grade 1 oesophageal varices was posted for an emergency category I caesarean section (LSCS) following foetal distress. She had tested positive for COVID-19 prior to the surgery. Admission bloods showed a low platelet count of 24x10^9/L, INR 1.1, fibrinogen 1.6 g/L whereas TEG showed low kaolin activated maximum amplitude (CK MA 36.4), low heparinase maximum amplitude (CKH MA 36.4), small alpha angle, normal R time and low functional fibrinogen (CFF 5.2) [Fig. 1]. General anaesthesia was chosen over central neuraxial blockade in view of a hypocoagulable state demonstrated by laboratory tests and TEG. Atonic PPH post-delivery resulted in a blood loss of 2 litres. The patient received 2g fibrinogen concentrate and 2 pools of platelets, guided by the pre-operative TEG pattern and the platelet count. TEG was repeated 8 hours post-operatively and a further 2g fibrinogen concentrate was administered based on the findings (low MA and CFF in both CK and CKH). [Fig 2] The following day CK MA remained low at 41.6, albeit with a near normal CFF MA value. This indicated continued hypocoagulability due to platelet deficiency or dysfunction. [Fig 3] The platelet count was 35x10^9/L, almost reaching antenatal level. The patient's usual post-operative pharmacological thromboprophylaxis for six weeks was omitted, after an MDT discussion as a risk of bleeding was heightened due to the coagulopathy. Instead, the patient was advised to take physiological precautions against VTE by wearing high length anti-embolic stockings and mobilise actively. She was successfully discharged on the third post-operative day and there were no thromboembolic complications on follow-up 30-days post-discharge.

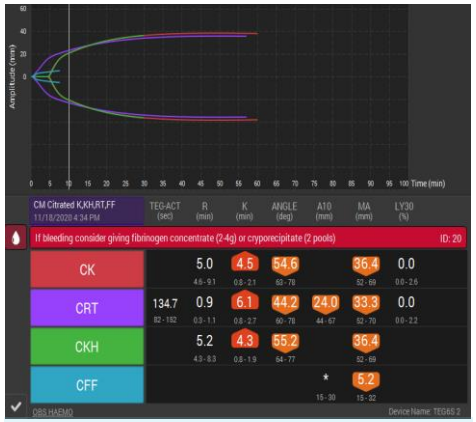


Fig. 1: Pre-operative TEG

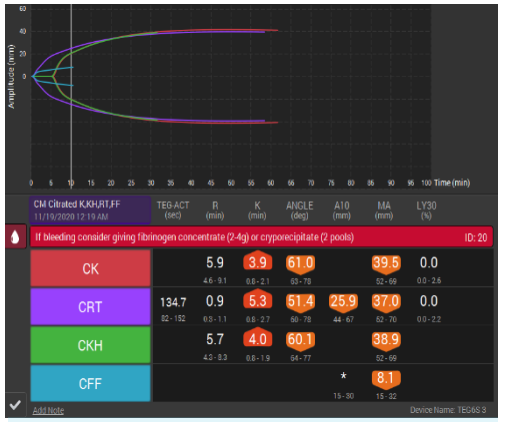


Fig. 2: TEG 8 hours post-operatively



Fig. 3: TEG 20 hours post-operatively

Discussion

Pregnancy is a hypercoagulable state which is owed to an increase in procoagulants factors (7, 8, 9, 10, 11 and fibrinogen) along with a decrease in physiological anticoagulants (Proteins C and S). Systematic review of use of viscoelastic testing in obstetrics has demonstrated that TEG can detect hypercoagulable changes in pregnancy and can be used to guide transfusion therapy. [1] Recent studies have shown that COVID-19 infection also induces a prothrombotic state, demonstrated by a hypercoagulable TEG [2]. In chronic liver cirrhosis however, the state of coagulation is often re-balanced with a low reserve of procoagulants and anticoagulants. Bleeding can tip this balance towards a hypocoagulable state [3]. TEG allowed us to evaluate the global haemostatic function in this patient with mixed complex coagulation changes. The rapid turnaround time assisted our decisions regarding transfusion of blood products peri-operatively. Furthermore, the presence of low platelets and a hypocoagulable TEG, despite prothrombotic conditions like pregnancy and COVID-19, empowered our decision to omit pharmacological thromboprophylaxis for this patient. The patient did not have thromboembolic events in postnatal period.

References

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