

Point of care coagulation during a cardiac surgery: How to use the Rotem®

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Cardiopulmonary bypass (CPB) induces haemostatic derangements that may contribute to bleeding and the need for transfusions after cardiac surgery. Blood transfusions have been associated with serious side effects including sternal wound infections, transfusion-related acute lung injury which will increase the mortality and morbidity of patients. Coagulopathy after cardiopulmonary bypass is caused by multiple factors in cellular and humoral elements of coagulation, and sometimes it is difficult to understand and improve the disorder during the operation. Bleeding management after CPB is commonly guided by platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), and fibrinogen level. Standard PT and aPTT might be poor predictors of bleeding related to invasive procedures and CPB surgery. Rotation thromboelastometry (ROTEM®; Rotem, Inc., Durham, NC) has been increasingly used during major surgery to decide the blood products in the clinical setting [1,2].

It was reported that FIBTEM assay with the Rotem® method is useful for rapid detection of decreasing fibrinogen below 200 mg/dL in cardiac surgery. The amplitude (A10 or MCF) of EXTEM / INTEM can be used similarly to TEG, but the differential diagnosis of thrombocytopenia versus hypofibrinogenaemia can be more specifically made using FIBTEM. Haemostasis is critically dependent on PLT function and fibrin clot formation, which are not fully reflected in PT/aPTT or endogenous TG assay. A point-of-care coagulation monitoring is necessary to improve the coagulation disorder.

Especially in paediatric cardiac surgery, intra-operative and postoperative transfusions of

blood and blood products are common and a prevalence of >80% has been reported. The use of intra-operative TEG/TEM has been shown to reduce transfusion requirements and costs in adult cardiac surgery.

The application of ROTEM® diagnostic algorithm might enable fast and effective coagulation management, resulting in life-saving and an overall reduction of transfused blood products.

The transfusion of packed red blood cells, FFP, platelets, or fibrinogen concentrates have been necessary to stabilize blood coagulation disorders and Factor VIII concentrate and fibrinogen have sometimes been life threatening and dangerous even with massive bleeding after cardiac surgery.

We started to use sufficient doses of FFP before coming off bypass which targets the stabilizing of fibrinogen clot after protamine reversal. We will show the new strategy of our transfusion and point of care coagulation treatment with ROTEM® during cardiac surgery.

References

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