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Detection of hypofibrinogenemia during cardiac surgery: a comparison of resonance-based thrombelastography with the traditional Clauss method

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Bleeding after cardiac surgery is associated with significant morbidity and mortality. Hypofibrinogenemia is a crucial explanatory factor for bleeding in this setting and may be rapidly detected using point-of-care viscoelastic tests (POC-VET). However, the correlation of POC-VET with coagulation assays is still unclear.

The current study aimed to correlate resonance-based POC-VET assays (Haemonetics TEG 6s) with the traditional nonrapid Clauss method. Another aim was to identify a cut-off value for the detection of hypofibrinogenemia (fibrinogen plasma level below 150 mg/dl) focusing on the maximum amplitude of the TEG 6s citrated functional fibrinogen (CFF) assay.

Adult patients undergoing cardiac surgery were screened for inclusion in this single-centre retrospective cohort study. Inclusion criteria were the availability of a TEG assay and timely corresponding laboratory results. Calculation of a CFF-maximum amplitude (CFF-MA) cut-off value was performed using receiver operating curve (ROC curve) analysis in the baseline cohort and validated in the control cohort. The best correlation with the Clauss method was observed for the CFF-MA (r=0.77; P<0.0001) compared with the citrate kaolin maximum amplitude assay (r=0.57; P<0.0001) and the citrate kaolin heparinase maximum amplitude assay (r=0.67; P<0.0001). A cut-off value of 19.9 mm for the CFF-MA was calculated [area under the curve 0.87 (95% confidence interval: 0.82–0.92; P<0.0001)]. This cut-off value had a sensitivity of 81.8% and specificity of 71.1% for identification of hypofibrinogenemia in the control cohort.

The authors conclude that the resonance-based thrombelastography analyser can identify hypofibrinogenemia. Furthermore, the authors suggest that future clinical studies should investigate the appropriate cut-off value for hypofibrinogenemia detection with POC-VET and whether cut-off value guided coagulation therapy with POC-VET may improve outcomes in patients who suffer from bleeding complications.

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