

Thrombelastography Platelet Mapping Identifies Platelet-Mediated Hypercoagulability Following a Hip Fracture

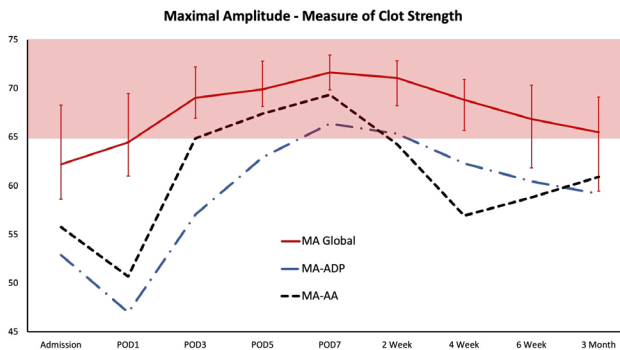
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Purpose: Thrombelastography (TEG) has been used to define hypercoagulability and increased venous thromboembolism (VTE) risk that ensues following a hip fracture. Platelet mapping (PLM) using TEG analysis can be used to activate platelets at either the adenosine diphosphate (ADP) receptor or at the thromboxane A₂ (AA) receptor, in order to evaluate platelet contribution to clot strength when activated only through those specific receptors. The study aim was to evaluate platelet contribution to hypercoagulability, in order to identify potential therapeutic targets for VTE prevention.

Methods: Serial TEG and PLM analyses were performed on admission, postoperative day (POD) 1, 3, 5, and 7, and then at 2, 4, 6, and 12 weeks postoperatively. All patients received thromboprophylaxis with low molecular weight heparin. All specimens were analyzed with a TEG 6S hemostasis analyzer. Inclusion criteria were adult patients aged 50 years or older with an acute hip fracture treated surgically. Exclusion criteria were prior history of VTE, active malignancy, or anticoagulation use. Hypercoagulability was defined as maximal amplitude (MA, a measure of clot strength) >65 on TEG analysis. Independent samples t tests and χ^2 analyses were used.

Results: 21 patients were included, with a mean age of 72.7 years (standard deviation 13.2) and 52.3% (N = 11) being female. 11 patients (52.3%) were treated with arthroplasty. TEG analysis demonstrated hypercoagulability (mean MA>65) at all time points until 12 weeks (Fig. 1). PLM identified platelet-mediated hypercoagulability based on elevated ADP-MA and AA-MA, with more pronounced platelet contribution demonstrated by the AA pathway. Patients treated with arthroplasty had significantly increased AA-MA compared with ADP-MA at POD 3 and 12 weeks.

Conclusion: TEG can be used to identify hypercoagulability and increased VTE risk following a hip fracture. PLM analysis suggests a platelet-mediated hypercoagulable state that may benefit from an anti-platelet agent that targets the AA platelet activation pathway, such as ASA.



The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.