Thrombelastography R-Time Predicts Thromboembolism After Extremity Trauma: A Secondary Analysis of PREVENT CLOT

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Purpose: We aimed to investigate if thromboelastography (TEG) at the time of admission following severe extremity trauma predicts future thromboembolic events utilizing a prospectively collected cohort. We hypothesized that previously described elevations in maximal amplitude (MA) on initial TEG would correlate with an increased risk of venous thromboembolism (VTE).

Methods: This was a secondary study of PREVENT CLOT, a multicenter, randomized trial that enrolled adult patients with an extremity fracture (from hip to midfoot or shoulder to wrist) treated operatively or any pelvic or acetabular fracture. Several participating sites performed TEG at the time of hospital admission, according to local protocols. The primary outcome of this analysis was postoperative VTE, including pulmonary embolism or deep venous thrombosis. We assessed the association between admission TEG values and VTE using univariate and multivariate regression analyses.

Results: The study group consisted of 1183 PREVENT CLOT patients, who had a TEG performed on their initial presentation. Of these patients, 47 (3.97%) had a VTE at a median of 9 days (interquartile range, 4 to 18 days). On admission TEG, reaction time (R-time) was significantly higher among those who experienced a VTE (2.45 vs 1.79, P = 0.004). There were no differences in VTE rates when examining MA of ≥65, ≥69, and ≥72 (P = 0.12, 0.21, and 0.19, respectively). When controlling for potential confounders, R-time of ≥2.0 was associated with a 2.1-fold increased risk of VTE (odds ratio 2.1, 95% confidence interval 1.1-4.3, P<0.001).

Conclusion: Our findings suggest an increased R-time on the admission TEG is associated with an increased VTE risk among patients with an operatively treated extremity fractures or any pelvic or acetabular fracture. None of the other admission TEG parameters were associated with VTEs.