

Thromboelastography (TEG) Is Predictive of Blood Transfusion and Mortality in Patients with Traumatic Femur Fractures

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Background/Purpose: Femur fractures are associated with hidden blood loss and commonly require blood transfusions. Transfusions for hemoglobin abnormalities are associated with significant morbidity and mortality, including increased risk of sepsis, pneumonia, and venothrombotic events. The purpose of this study was to examine the coagulation kinetics of femur fracture patients by analyzing thromboelastography (TEG) results that were conducted on admission and their relationship to transfusions and mortality of these patients.

Methods: We retrospectively queried our Level I trauma center's registry for patients who arrived as priority 1 traumas with an associated diagnosis of femur fracture and received a TEG on admission between January 2012 and June 2015. Patients taking anticoagulants prior to admission were excluded. TEG variables R, MA, and LY30 were recorded. Blood product transfusion and mortality were also recorded. Statistical analysis was performed using logistic regression analysis, Pearson correlation, and analysis of variance with significance set at $P < 0.05$.

Results: 74 patients met inclusion criteria. Mean age was 50.3 years (range, 17-90 years). 64% (47/74) were male. The overall mortality rate was 11.6%. Compared to patients with an LY30 < 1 , patients with an increased value exhibited a threefold higher mortality rate. A significant correlation was noted between the degree of clot lysis at 30 minutes (LY30) and mortality rate ($r = 0.348$, $P = 0.0407$). There was a significant correlation between LY30 and the units of packed red blood cells transfused in the first 24 hours ($r = 0.259$, $P = 0.012$). Patients received an average of 3.65 units of packed red blood cells during the first 24 hours of admission. There was a large discrepancy between the calculated and intraoperative blood loss.

Conclusion: Increasing fibrinolysis in trauma patients with femur fractures is associated with more blood transfusions and higher rates of mortality. This study highlights the critical need to limit hidden blood loss associated with femur fractures. Blood conservation strategies should begin at patient presentation and focus on correcting specific coagulation abnormalities. Future studies should evaluate the utility of antifibrinolytics in reversing fibrinolysis as exhibited on TEG.

Probability of Mortality Based on LY30

