# Fibrinogen; a predictor of injury severity and mortality among patients with traumatic brain injury in Sub-Saharan Africa.

Ssenyondwa John Baptist, Kiryabwire Joel, Martin Kaddumukasa, Devereaux Michael, Larrey Kasereka Kamabu, Moses Galukande, Mark Kaddumukasa, Martha Sajatovic, Makumbi Timothy Kabanda.

Corresponding author: Ssenyondwa John Baptist; johnbaptistssenyondwa@gmail.com. +256777706189. Affiliation: Makerere University College of Health Sciences.

**Abstract.**

Studies show that fibrinogen concentrations <2g/L in patients with traumatic brain injury (TBI) is associated with increased mortality. However, little is known regarding fibrinogen levels and TBI severity as well as mortality in sub-Saharan Africa despite shouldering a high burden of TBI. We therefore set out to determine whether fibrinogen levels are associated with TBI severity and outcome. To determine the sensitivity and specificity of fibrinogen levels and the association with severity and mortality among TBI patients at Mulago Hospital.

We prospectively enrolled 213 patients with TBI aged between 13 and 60 years of age and presenting within 24 hours of injury. Patients with preexisting coagulopathy, concurrent use of anticoagulant or antiplatelet agents, preexisting hepatic insufficiency, diabetes mellitus and who were pregnant were excluded. Fibrinogen levels were determined using the Clauss fibrinogen assay. Logistic regression analyses were conducted to identify the association between fibrinogen level and 7-day outcomes.

Majority of the patients were male (88.7%) and nearly half were aged 30 or less (48.8%). Fibrinogen levels <2g/L were observed in 35.1% of the study participants. The average time spent in the study was 3.7 ± 2.4 days. The sensitivity and specificity using fibrinogen <2g/L was 56.5% and 72.9% respectively. Fibrinogen levels predict TBI severity with an AUC = 0.656 (95% CI 0.58–0.73: P = .000) Fibrinogen levels <2g/L were independently associate with severe TBI. (Adjusted odds ratio 2.87 CI, 1.34–6.14: P = .007). Levels above 4.5g/L were also independently associated with injury severity (adjusted odds ratio 2.89, CI 1.12–7.48: P < .05) Fibrinogen levels more than 4.5g/L were independently associated with mortality (OR 4.5, CI; 1.47–13.61, P < .05).

The fibrinogen level is a useful tool in predicting severity including mortality of TBI. Fibrinogen levels may be used as an additional tool to screen TBI patients for injury severity especially among patients with Glasgow coma scale scores of <14.

***Abbreviations**:* CT = computed tomography, GCS = Glasgow coma scale, SBP = systolic blood pressure, TBI = traumatic brain injury, TRISS = trauma and injury severity score.

**Keywords: fibrinogen, mortality, outcomes, traumatic brain injury**