Clotting Tests Associated with Hypofibrinogenemia and Systemic Bleeding in Green Pit Viper and Russell’s Viper Bite Patients

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Background: Fibrinogen less than 100 mg/dL is recommended for predicting bleeding risk in hematotoxic snake bite cases, but it’s not widely available. Data on using venous clotting time (VCT), 20-minute whole blood clotting test (20WBCT), platelets, prothrombin time (PT), international normalized ratio (INR), partial thromboplastin time (PTT) to predict systemic bleeding in hematotoxic snake bite cases are limited.

Objective: To determine association between clotting tests (VCT, 20WBCT, platelets, PT, PTT, INR) and 1) fibrinogen < 100 mg/dL, and 2) systemic bleeding in patients bitten by green pit viper and Russell’s viper.

Methods: This was a prospective cohort study involving cases bitten by green pit viper and Russell’s viper, who were admitted to Sawanpracharak Hospital, Nakhon Sawan, from October 2016 to December 2017. Patients’ blood was collected for fibrinogen, PT, INR, PTT, platelet count, VCT, and 20WBCT at 0, 4, 6, 10 hours after admission. The association between parameters and both fibrinogen < 100 mg/dL and systemic bleeding was determined using odd ratio (OR) and 95% confidence interval (95% CI).

Results: There were 30 cases (21 bitten by green pit viper and 9 bitten by Russell’s viper). Median age was 43 years (IQR 33.3-57.8). One-hundred and sixty sets of blood specimens were collected. Four patients had systemic bleeding. A total 31 courses of antivenom were given to 15 patients. Factors associated with fibrinogen < 100 mg/dL were VCT > 20 min (OR 17.2, 95%CI 1.6-164.4), unclotted 20WBCT (OR 10.8, 95%CI 1.5-72.1) and INR > 1.2 (OR 21.2, 95%CI 3.1-227.7), PT > 13 sec (OR can’t be calculated; all specimens with fibrinogen < 100 mg/dL had PT > 13 sec). Platelet < 50,000/mcL, and PTT > 38 sec, was not associated with fibrinogen < 100 mg/dL. Factors associated with systemic bleeding were fibrinogen < 100 mg/dL (OR 27.0, 95%CI 2.3-359.0), platelet < 50,000/mcL (OR can’t be calculated; all specimens with fibrinogen < 100 mg/dL had PT > 13 sec). Platelet < 50,000/mcL, and PTT > 38 sec, was not associated with systemic bleeding had platelet < 50,000/mcL, VCT > 20 min (OR 49.8, 95%CI 5.1-2,311.8), and unclotted 20WBCT (OR 86.0, 95%CI 7.6-3,995.0). INR > 1.2, PT > 13 sec, and PTT >38 sec were not associated with systemic bleeding.

Conclusion: Fibrinogen < 100 mg/dL is associated with VCT > 20 min, unclotted 20WBCT, INR > 1.2 and PT > 13 sec. Whilst, systemic bleeding is associated with fibrinogen < 100mg/dL, platelet < 50,000/mcL, VCT > 20 min and unclotted 20WBCT in patients bitten by green pit vaper and Russell’s viper.

Keywords: Green pit viper, Russell viper, fibrinogen, 20WBCT, VCT