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The coagulopathy and clinical features between the snakebites by Deinagkistrodon acutus and Daboia russelii siamensis in Taiwan

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Objective: There are six kinds of venomous snakes in Taiwan. Among them, *Deinagkistrodon acutus (D. acutus)* and *Daboia russelii siamensis* (Russell's viper) belonging to the family of viperidae, possess hemotoxic venom which usually causes clinically significant coagulopathy. Cases due to these two kinds of snakebite are very rare; they account for 2.4% (*D. acutus*) and 2.9% (Russell's viper) of the total venomous snakebites in eastern Taiwan. Their similar clinical presentation may influence the use of correct antivenin; thus this study aims to compare their clinical features and coagulopathy.

Methods: The medical records of patients presenting to the emergency department because of *D. acutus* or Russell's viper envenomation between 2003 and 2016 were retrospectively reviewed. Clinical information was collected and analyzed.

Results: From 2003 to 2016, 16 patients bitten by *D. acutus* and 12 patients by Russell's viper were included. In the analysis of coagulation profile, the group of *D. acutus* victims presented with lower platelet counts (60.1 vs. 177.3 x 10^3/uL, p=0.003), lower D-dimer level (2756 vs. 103066 ìg/L, p=0.024), and more prolonged prothrombin time (PT) (104.6 vs. 59.2 sec, p=0.003) and *activated partial thromboplastin time (aPTT)* (132.8 vs. 70.5 sec, p=0.003) than the group of Russell's viper victims. The total dose of antivenin used was higher in the group of *D. acutus* (6.8 vs. 4.7 vial, p=0.027). All the patients bitten by *D. acutus* were in summer and fall was also different from the season of Russell's viper snakebite (p=0.005). In terms of the local signs after envenomation, the formation of hemorrhagic bulla was specifically presented in the group of *D. acutus* (p = 0.01). The need for surgical intervention was also significantly higher in the *D. acutus* group (p=0.003), because of suspected compartment syndrome or tissue necrosis. After multivariate analysis of the above significant features, thrombocytopenia (platelet < 100,000/uL) was significantly associated with *D. acutus* envenomation.

Conclusion: *D. acutus* and Russell's viper envenomation both cause severe coagulopathy clinically. The presentation of thrombocytopenia (platelet < 100000/uL), hemorrhagic bulla formation and the need for surgical intervention may indicate the *D. acutus* envenomation. In contrast, patients with extremely high D-dimer (D-dimer > 5000 mg/ml) may hint to Russell's viper envenomation.