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Point of care D-dimer at admission as predictor for envenomation amongst snakebite victims: a single center prospective observational study

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Aim and objectives: This prospective observational diagnostic test study aimed to assess the diagnostic accuracy of D-dimer, a fibrin degradation product, measured at admission, in detecting envenomation in snakebite victims. Secondary objectives included evaluating serum D-dimer and myoglobin's diagnostic accuracy for detecting coagulopathy and any envenomation.

Methodology: The study was conducted in the Emergency Department of a tertiary care teaching hospital in Kerala, India, from March to December 2022. Ninety-two snakebite victims with written informed consent were enrolled, and point-of-care D-dimer testing was performed. Data on demographics, snake type, clinical syndromes, and coagulation study results were collected. D-dimer levels were measured using a fluorescence immunoassay test device, and clotting time and PT were assessed.

Results: Among the patients, 48 exhibited signs of envenomation, and 19 developed VICC. D-dimer levels positively correlated with prothrombin time($r=0.28$), international normalized ratio($r=0.25$), and activated partial thromboplastin time($r=0.27$), while negatively correlating with fibrinogen levels($r=-0.22$).

Envenomation cases had significantly higher D-dimer levels (100-5000, median: 1510, $p < 0.001$) than non-envenomation cases (100-3750, median: 100, ($p < 0.001$) and average D dimer in patients with coagulopathy is higher (100-5000, median: 1960, ($p < 0.001$) compared to those without (100-4120, median: 109, ($p < 0.001$). A D-dimer cutoff of 240 ng/ml showed 80.9% sensitivity and 81% specificity for diagnosing envenomation. Multivariate logistic regression confirmed D-dimer's independent association with envenomation (OR = 17.4, 95% CI: 6.0-50.3, $p < 0.001$) and detecting VICC (OR = , 95% CI:, $p < 0.001$)

Conclusions: D-dimer is a reliable biomarker for detecting snake envenomation and predicting coagulopathy in snakebite cases. Early measurement of D-dimer levels enables timely administration of Anti-Snake Venom (ASV), potentially reducing complications and mortality. An optimal cutoff value of 240



ng/ml enhances its clinical utility, and its high odds ratio suggests importance in risk stratification and predicting envenomation severity. Its moderate sensitivity and specificity make it a valuable initial screening tool.