Galectin-3 predicts ICU need in severe scorpion envenomation.

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Financial support: This work was supported by the under Grant: Conselho Nacional de Desenvolvimento Científico e Tecnológico number: 406821/2021-6(CNPq/MCTI/FNDCT Nº 18/2021 – Faixa A – Grupos emergentes)

Keywords: Galectin 3, biomarker, miocarditis, intensive care, scorpion sting

Abstract:

Introduction: Scorpion envenomation poses a significant global health threat. While antivenom is a crucial treatment, effective management depends on early and accurate diagnosis of systemic complications, particularly life-threatening cardiopulmonary effects. Current diagnostic approaches utilize echocardiography and laboratory markers such as troponin, creatine phosphokinase-MB (CKMB), and brain natriuretic peptide (BNP). However, relying solely on clinical criteria to predict which patients require intensive care can be challenging. This can lead to delays in diagnosis and potentially suboptimal management, increasing the risk of irreversible organ damage and mortality, especially in vulnerable pediatric populations. **Objective:** This study investigates the potential of a previously unstudied cardiac biomarker in scorpion stings, Galectin 3, as a prognostic tool for indicating the need for intensive care. **Material and Methods:** Prospective observational study that evaluated patients aged 0 to 19 years, with moderate and severe scorpionism treated at a reference center over 18 months. Serum samples (25 µl) were analyzed using multiplex ProcartaPlex immunoassays (Invitrogen kits), a sandwich ELISA-based method employing Luminex technology to quantify multiple protein targets simultaneously. **Results and conclusion:** 49 Patients were included in this study. Regarding the biomarkers tested, troponin and galectin-3 measured in serum were significantly higher in

patients admitted to the ICU (p=0.016 and p=0.037). The accuracy of these two biomarkers for identifying patients referred to the ICU was assessed using the area under the ROC curve. The results showed that troponin I (AUC: 0.707 [95% CI: 0.554-0.860], p=0.017) and galectin-3 (AUC: 0.680 [95% CI] 0.528-0.833], p=0.037) have moderate accuracy for identifying patients with indication for ICU admission. This study demonstrates a significant association between elevated Galectin-3 levels and intensive care unit (ICU) admission in patients with severe scorpion envenomation. Its diagnostic accuracy, comparable to troponin in predicting ICU admission, is noteworthy. Given Galectin-3's established role in adverse outcomes in acute heart failure, as well as its association with prolonged ICU stay and increased need for invasive interventions in this study, it emerges as a potentially valuable new biomarker for assessing cardiac dysfunction severity and predicting prognosis in scorpion envenomation. Further research is warranted to validate these findings and explore Galectin-3's potential as a clinical tool.

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