

## Predictive score for carbapenem-resistant gram-negative bacilli sepsis: single-center prospective cohort study

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**Objective:** Sepsis caused by carbapenem-resistant Gram-negative bacilli (CR-GNB) persist with a limited treatment arsenal and high mortality. The aim of this study was to develop a clinical-epidemiological score to predict the etiology of CR-GNB in hospital sepsis, in an adult intensive care unit (ICU) of a tertiary hospital in Rio de Janeiro.

**Methods:** Based on a prospective cohort study and using a case-case-control design, the following predictive factors for CR-GNB sepsis were previously determined and published: infection prior to the sepsis episode (OR = 4.28; 95% CI: 1.77-10.35; p= 0.001), previous use of mechanical ventilation (OR = 4.21; 95% CI: 1.17-15.18; p= 0.028), previous use of carbapenem (OR = 3.42; 95% CI: 1.37-8.52; p= 0.008), and length of hospital stay (OR 1.03; 95% CI: 1.01-1.05; p= 0.007). In this study, each factor was scored with one point, according to the logistic regression coefficients, and an ROC curve analysis determined the accuracy of the score in predicting sepsis by CR-GNB in the entire cohort studied.

**Results:** Of the total of 1,060 patients admitted and followed by 11,108 patient-days, from August 2015 to December 2017, 283 episodes of SIRS or SEPSE in 197 patients were preliminarily monitored, after the inclusion and exclusion criteria of the cohort. Of these, 110 episodes (39%) presented at least one species of CR-GNB as etiology and 173 (69%) were in the control group, as follows: 54 (19%) episodes caused by carbapenem-susceptible GNB, 36 (13%) by other non-GNB etiologies and 83 (37%) without determined etiology. The cutoff point  $\geq 3$  had the best combination of sensitivity (94%, 95% CI: 87% - 97%) and specificity (54%, 95% CI: 47% - 62%), negative predictive value (93%, 95% CI: 86% - 97%) and positive predictive value (70%, 95% CI: 49% - 64%). The area under the ROC curve was 0.78 (95% CI: 0.73 - 0.84).

**Conclusions:** The risk score had a good ability to predict sepsis by CR-GNB, and the clinical-epidemiological factors scored are easily obtained in the first medical evaluation. Therefore, external validation is recommended to guide empirical antimicrobial therapy in centers with a similar incidence of CR-GNB sepsis.