

O119

2-hour Oral Session

MDR Enterobacteriaceae: clinical epidemiology and outcomes

Comparing two predictive models for early mortality of patients with bloodstream infection due to carbapenemase-producing Enterobacteriaceae: the INCREMENT project

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Background: The aim of our study was to develop a predictive model for early mortality for patients with bloodstream infections (BSI) due to carbapenemase-producing Enterobacteriaceae (CPE) that can help clinicians in the management of these patients.

Material/methods: A multi-national (12 countries, 37 hospitals), retrospective cohort study including patients with monomicrobial BSI due to CPE between January 2007 and December 2013 was performed. Outcome variable: 14-day mortality. Predictive variables analysed in the study were assessed when the isolate was identified and the susceptibility data were available. The 480 cases included in our study were randomly divided into a derivation cohort (DC) formed by 2/3 of the patients, which was used to obtain two predictive models and scores (one using logistic regression and the other using the TreeNet software, Salford Systems), and a validation cohort (VC) in which the scores were validated. The predictive ability of both modes and scores was measured by estimating their areas under the ROC (AUROC). The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy were calculated for different cut-offs of the score finally selected.

Results: The logistic regression model in the DC included the following variables: severe sepsis or shock at presentation (5 points); Pitt score ≥ 6 (4); Charlson index ≥ 2 (3); no appropriate empirical therapy and no early targeted therapy (3); source different to urinary or biliary (3); fatal underlying disease (2). It showed an AUROC of 0.84 (95% CI: 0.80-0.88), while the model obtained from TreeNet (which included the above variables plus 9 additional ones) presented an AUROC of 0.90. In the VC, the logistic regression score showed an AUROC: 0.80 (95% IC:0.72-0.87) and the TreeNet score, 0.81 (95% IC: 0.74-0.88). Under the principle of parsimony, the multivariate score was finally chosen. The Se, Sp, PPV and NPV are showed in the Table.

Conclusions: We have developed and validated a predictive model for early mortality in patients with BSI due to CPE that could help decision-making on a more aggressive clinical management in certain patients.

Table 1 shows risk of 14-days mortality according different multivariate Score cut-offs.

Validation cohort	Sensitivity	Specificity	PPV	NPV	Acc
Score ≥ 5	96,4%	20,2%	40,2%	90,9%	47,4%
Score ≥ 10	76,4%	66,7%	56,0%	83,5%	70,1%
Score ≥ 15	49,1%	91,9%	77,1%	76,5%	76,6%
Score = 20	3,6%	99,0%	66,7%	64,9%	64,9%