Risk factors associated with the acquisition of Pseudomonas aeruginosa resistant to carbapenems in a university hospital in Zaragoza, Spain

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P. aeruginosa is a clinically significant and opportunistic pathogen, usually associated with nosocomial infections, causing high morbidity and mortality. Displays not only intrinsic resistance, but also ability to acquire resistant mechanism during antibiotic therapy. Acquisition of drug-resistant pathogen is involved by many factors such as microbial substitution by antibiotic selection pressure and transmission in hospital. Carbapenem resistance in P. aeruginosa has become a serious health threat worldwide due to the limited options available for its treatment.

The aim of this study was to analyze the risk factors associated with the acquisition of carbapenem-resistant P.aeruginosa in a tertiary care hospital.

**Materials and Methods**

We performed a retrospective review of the clinical, demographic, microbiological and antibiotic susceptibility data of 140 clinical isolates of P. aeruginosa, including one isolate per patient in the first trimester of 2013.

For the statistical analysis we used the chi-square test (Yates-corrected) to compare categorical data. A multivariate logistic regression model was used to determine independent risk factors for variables that were associated at an univariate analysis level with P values less than 0.10 (SPSS program for Windows, version 18; SPSS Inc, Chicago II).

**Results**

Of the 140 patients studied, 110 (78.6%) received prior antibiotic treatment, of these, 48 patients (43%) had carbapenem-resistant P.aeruginosa. Patients with carbapenem-resistant P.aeruginosa isolates spend more days in hospital (average 50.22) compared to the group without resistance (average 27.42).

The independent risk factors associated with the acquisition of carbapenem-resistant P.aeruginosa after the multivariate analysis are shown in table 2.

**Conclusions**

- In our hospital, there is a high rate of P. aeruginosa resistance, with a high percentage of carbapenem-resistant isolates. Antibiotic treatment prior to isolation evidences high antibiotic pressure that favors the selection of resistances.
- The days between admission and isolation, neoplasia and prior treatment with aminoglycosides are the risk factors associated with the acquisition of carbapenem-resistant P. aeruginosa in our hospital.
- The identification of the risk factors will allow defining the local epidemiology, implementing interventions and guiding the most efficient empiric therapy.