OPTIMIZATION OF CARBAPENEMS USE IN INTRAABDOMINAL INFECTIONS

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OBJECTIVES

The use of broad-spectrum antibiotics is often necessary in the context of severe intra-abdominal infections, although their overuse may result in an increasing of resistances. Several factors that suggest the presence of multidrug-resistant microorganisms have been identified.
The aim of this study was to analyze the usefulness of these risk factors to identify biliary tract infections caused by extended-spectrum beta-lactamase (ESBL)-producing bacteria.

METHODS

We prospectively included all patients in the 4th day of antibiotic therapy at General Surgery Service in Hospital Universitario Marqués de Valdecilla (Santander, Spain) from 1st. January to 30 th June 2016. Clinical, epidemiological and microbiological were reviewed. Risk factors of presence of ESBL-producing bacteria were recorded, according to Spanish guidelines (Guirao, 2009 and Rodríguez Baño, 2015).

RESULTS

Two hundred and ten patients were reviewed, 131 (62%) in 4th day of antibiotic therapy (53% male, mean age 68 years (SD=15)). The most frequent reason for treatment was intraabdominal abscess (17%). According to SIRS criteria, 8% severe sepsis. Five (3.8%) patients died, one of them due to infection **(Table 1).** The initial antimicrobial agent was a carbapenem in 56% patients (**Figure 1**). The most frequent microorganism was *E. coli* (22%; 2% ESBL-producing) (**Figure 2**).

Sensitivity, specificity, and positive and negative predictive values for both 2009 and 2015 Guidelines as predictors of ESBL-producing enterobacteria are presented in **figure 3.** Despite their high negative predictive value, carbapenems were chosen as initial therapy in 50% of patients without 2009-Risk Factors, in 38% of patients without “3-points predictive score”-risk factors and in 89% of patients without “8-points predictive score”-risk factors.

Table 1. Characteristics of patients

	n=131
Males (%)	69 (53)
Age (mean (SD))	68 (15)
Main diagnosis (%) - Intraabdominal abscess - Cholecystitis - Intraabdominal sepsis - Gastrointestinal perforation - Secondary peritonitis	 22 (17) 21 (16) 13 (10) 12 (9) 9 (7)
SIRS criteria: - Sepsis (%) - Severe sepsis (%)	 40 (30) 11 (8)
Surgery	75 (59)
Mortality	5 (3.8)

Figure 1. Initial antimicrobial therapy

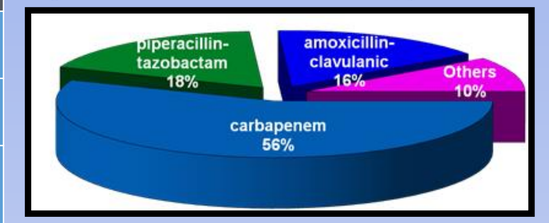
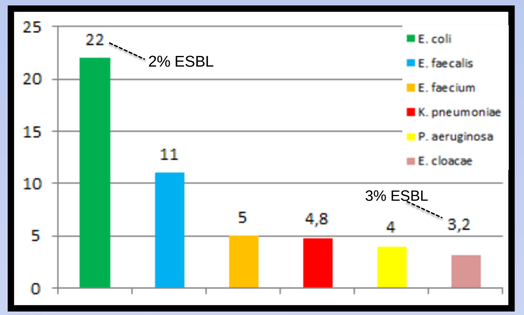
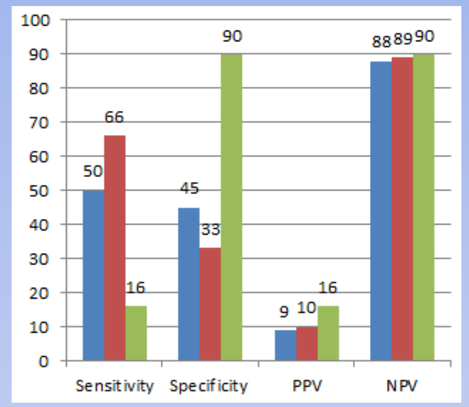


Figure 2. Initial antimicrobial therapy



ESBL: extended-spectrum beta-lactamase

Figure 3. Prediction of ESBL producing enterobacteria



ESBL: extended-spectrum beta-lactamase; PPV: positive predictive value; NPV: negative predictive value.

Criteria of presence of ESBL-producing bacteria: hospital stay >15 days, transfer from a sanitary center, some kinds of comorbidities, recurrent urinary tract infection, biliary obstruction, immunosuppression or previous antibiotic therapy.

- Guirao X. Rev Esp Quimioterap. 2009.
- Rodríguez-Baño J. Enferm Infecc Microbiol Clin. 2015

CONCLUSIONS

- Risk factors proposed in intraabdominal infection caused by ESBL-producing bacteria have a high negative predictive value.
- Scores could be useful in order to reduce the overuse of carbapenems and other broad-spectrum antibiotics treatments as initial therapy in patients with such infections.