

How do we use the rapid LAMP-PCR information of Enterobacterales ESBL producers causing bacteremia to guide empirical treatment?

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Background

Inadequate empirical antimicrobial therapy (EAT) for bacteremia is associated with an increase in the mortality rate. The early detection of resistance mechanisms will imply a more suitable empiric therapy, reducing the time to obtain the complete antimicrobial susceptibility testing (AST).

The **aim** of this study is to evaluate whether the information generated from a rapid molecular technique for ESBL detection modifies the treatment of bacteremia caused by Gram-negative bacilli (GNB) before the definitive AST report is available.

Methods

A multicenter 3 year-intervention study was performed on Enterobacterales monobacterial bacteremia were included. The study was conducted in two phases:

1 Pre-intervention phase using a standard work flow routine without performing the molecular test.

2 Intervention phase with a modified routine in order to detect resistance mechanisms directly from positive blood cultures by LAMP-PCR (Genie, eazyplex SuperBug CRE, Menarini)

All clinical and microbiological relevant information were recorded in RedCAP database. EAT evaluation was performed *a posteriori* (optimal, appropriate, inappropriate, inadequate) according the AST result at three points: (1) no microbiology information available; (2) the blood cultured tested positive and identification or partial AST was available; (3) antibiogram-guided treatment. An EAT rating scale (-2 to +2) was applied to evaluate goodness of EAT compared with the targeted antibiotic indicated after microbiology lab information was available (Gram stain/MALDI-TOF in pre-intervention and LAMP-PCR in intervention phase).

Results

A total of 163 bacteremia were included. Clinical information of the patients included in both periods is shown in Table 1. Evaluation of empirical treatment modification with and without LAMP-PCR information is shown in Figure 1.

Pre-intervention and intervention empirical treatment rating score were 0.86 and 1.2, respectively.

	Pre-intervention	Intervention
Total Bacteremias	83	80
ESBL producers	13,30%	18,80%
Sex		
Male	52,9%	45,0%
Female	47%	55%
Mean age	72 yo	75 yo
Origin		
Community acquired	57,8%	62,5%
IRAS	28,9%	27,5%
Hospital acquired	13,3%	10,0%
Focus		
Urinary	65,0%	62,5%
Abdominal	9,6%	6,3%
Biliar	15,7%	22,5%
Other	9,7%	8,7%
Previous colonization	5,9%	10,0%
Preprescrip Service		
Emergency	69,4%	65,0%

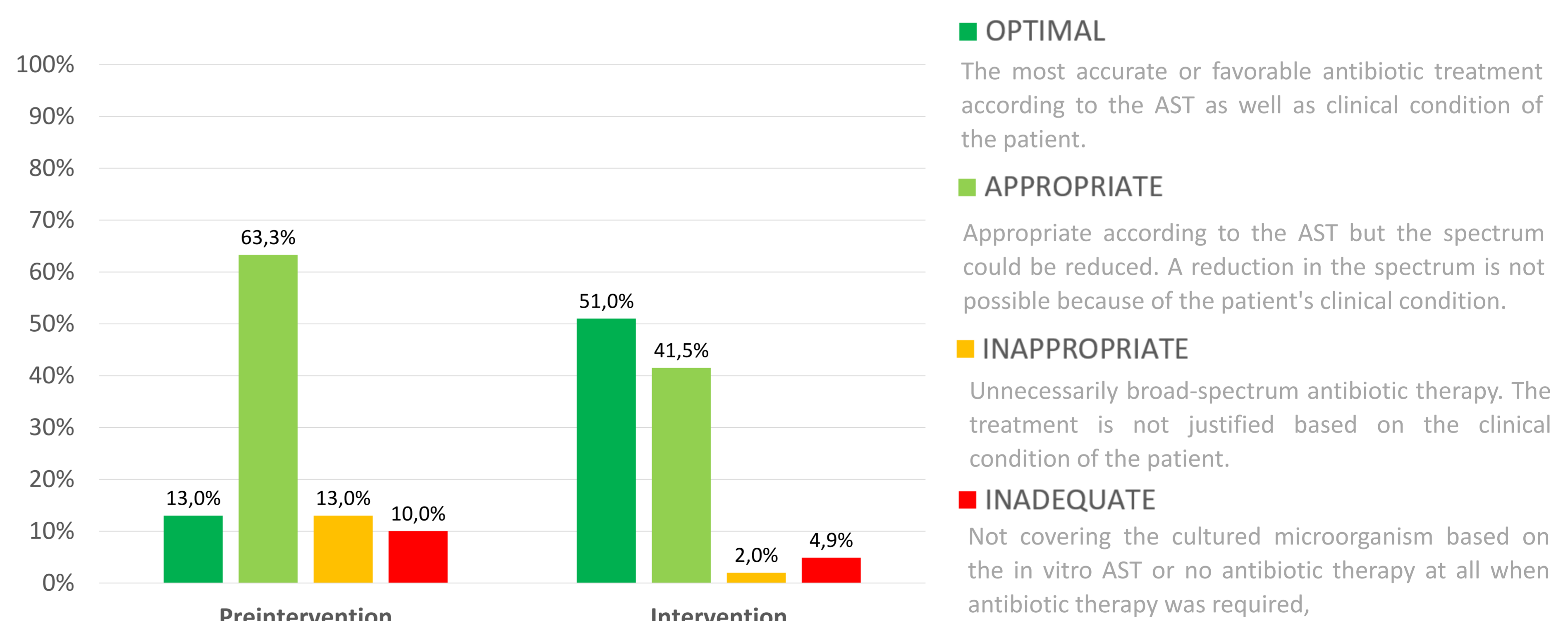


Table 1. Clinical information of the patients included in both periods.

Figure 1. Evaluation of EAT when microbiology reports partial information of the result.

Conclusions

- Optimal and appropriate EATs are improved when molecular resistance is available.
- Early knowledge of the resistance mechanism helps to reduce the number of inappropriate and inadequate EATs.
- Early reporting of the resistance mechanisms to the clinician improves the appropriateness of the EATs in Enterobacterales bacteremias.

