Risk factors associated with bloodstream infections due to multiresistant bacteria in burn patients

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INTRODUCTION

Sepsis represents the first cause of death in severely injured burn patients.
Moreover, multiresistance emergency is associated with an increase in costs, ICU length of stay and mortality (Fig. 1).

The aim of this study is to identify risk factors associated with bloodstream infections (BSI) secondary to multiresistant gram negative bacilli (MR).

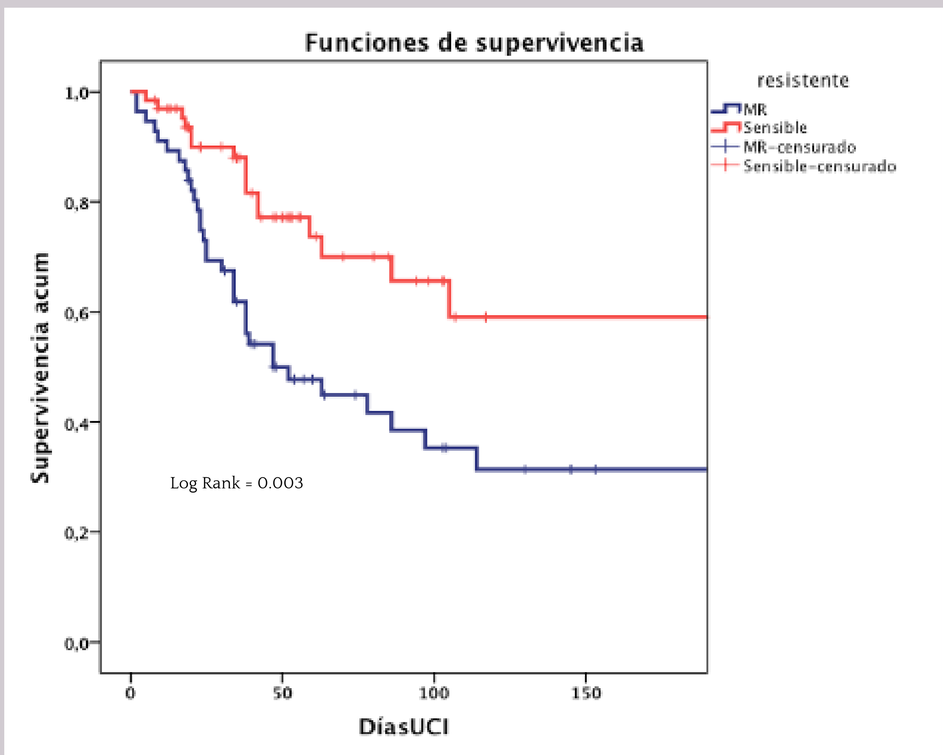

Fig. 1: Kaplan Meier curve. Comparison between MR BSI (blue) and non MR BSI (red).

METHODOLOGY

We conducted a retrospective, descriptive study, among burn patients who developed BSI between January 2006 and January 2019.
Data are presented as frequencies (percentage) for qualitative variables and medians (25th-75th percentiles) for quantitative variables.
We used an univariate analysis to determine factors associated with MR (Tables 1 and 2).
Factors with a p value < 0.2 were included in a multivariate analysis.
We performed two multivariate analysis. On one hand, we evaluated clinical factors associated with MR; and on the other hand, we evaluated the antibiotics used prior to BSI development.
We considered significant a p value < 0.05.

RESULTS

We analyzed 121 documented episodes of gram negative bacilli BSI in 95 patients.
The mean age was 36 (24-61) years. Total burned surface area (TBSA) was 30% (16%-44%) and the ABSI score was 8 (6-9).

Multivariate analysis:

Clinical Factors

TBSA > 20% (OR 3.16 IC 95% (1.32-7.55) p=0.01) and the need of escharotomy (OR 2.70 IC 95% (1.19-6.25) p=0.017) were associated with BSI due to MR (Table 3).

Antibiotics

Prior use of Quinolones (OR 2.9 IC 95% (1.2-7.14) p=0.016) and Colistin (OR 2.7 IC 95% (1.06-7.14) p=0.039) were associated with MR BSI (Table 4).

	Overall	MR	No MR	p
Female sex	38/121	13/56 (23%)	25/65 (38%)	0.07
Age (years)	36 (24-61)	36 (24.5-55.25)	38 (24-62)	0.56
TBSA	30 (16-44)	36 (26-54.5)	20 (9.5-36.5)	<0.001
Smoke injury	96/121 (79%)	46/56 (82%)	50/65 (77%)	0.47
Escharotomy	69/121 (57%)	40/56 (71%)	29/69 (42%)	0.003
IMV	114/121 (94%)	55/56 (98%)	59/65 (91%)	0.08
Vasopressors	95/121 (79%)	46/54 (85%)	49/64 (77%)	0.23
Days between injury and BSI	15 (7-29)	16.5 (8-27.75)	13 (7-30.5)	0.58
ABSI	8 (6-9)	8 (6-9)	7 (5-9)	0.018

Table 1: Univariate analysis of clinical factors related to BSI p<0.05

	MR	No MR	P
Aminopenicillins	91%	83%	0,19
Clindamicyn	52%	40%	0,19
Cephalosporins 1st	11%	14%	0,6
Cephalosporins 3rd	39%	34%	0,53
Aminoglycosides	41%	35%	0,52
Carbapenems	50%	42%	0,35
Glycopeptides	2%	3%	0,64
Quinolones	73%	49%	0,007
Colistin	34%	17%	0,031
Antipseudomonal Penicillins	2%	8%	0,13
Trimeth/sulfamethox	13%	14%	0,82

Table 2: Univariate analysis of antibiotics related to BSI.

	OR	IC 95%	p
Female sex	0.72	0.074-7.14	0.72
IMV	1.38	0.13-13.5	0.78
Escharotomy	**2.70**	**1.19-6.25**	**0.017**
TBSA>20%	**3.16**	**1.23-7.55**	**0.01**

Table 3: Final adjusted model including predictors with a p<0.2 in the regression model.

	OR	IC 95%	p
Penicilins	1.33	0.36-4.85	0.66
Clindamicyn	1.2	0.52-3.1	0.58
Colistin	2.7	1.06-7.14	0.039
Quinolones	2.9	1.2-7.1	0.016
Antipseud Penicilins	0.11	0.01-1.21	0.07

Table 4: Multivariate analysis of antibiotics related to MR BSI.

CONCLUSION

TBSA > 20%, need of escharotomy and prior use of Quinolones and Colistin were identified as risk factors associated with MR BSI.

It is imperative to generate a policy of optimization in the use of antibiotics.