

Risk factors for carbapenem-resistant Enterobacteriaceae bacteraemia in cancer patients: results from the ROCAS Study

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Background:

Carbapenem-resistant Enterobacteriaceae (CRE) are increasing as prevalent pathogens in cancer and hematopoietic stem cell transplant (HSCT) patients. CRE bacteraemias are associated with ineffective initial empirical therapy and high mortality rates.

Materials/methods:

Prospective, multicenter study. Adult cancer and HSCT patients with Enterobacteriaceae bacteraemia were included in 12 centers in Argentina, from May 2014 to June 2018. To evaluate risk factors for carbapenem-resistant Enterobacteriaceae, variables with $p < 0.05$ in univariate analysis were included in a logistic regression model for multivariate analysis.

Results: 443 patients were included

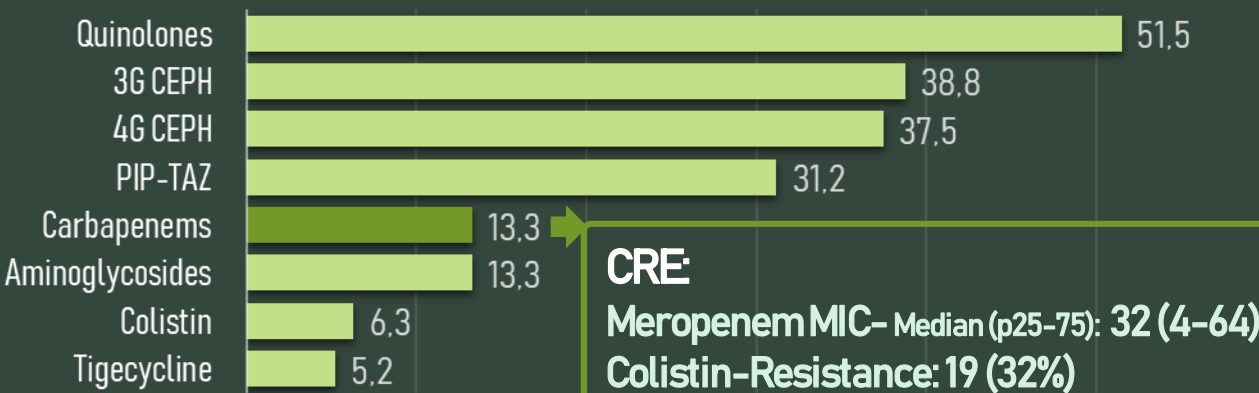
Baseline Characteristics			
Variables	CSE (n=384)	CRE (n=59)	p
Age (years) – Median (p25–75)	55 (37–66)	51 (39–64)	0.314
Hematologic neoplasms (non HSCT) – n(%)	226 (59%)	40 (68%)	0.192
HSCT – n (%)	69 (18%)	16 (27%)	0.09
Solid tumors – n (%)	89 (23.2%)	3 (5.1%)	0.001
Neutropenia – n (%)	258 (67%)	52 (88%)	0.001
High risk (MASCC Score) – n (%)	222 (86%)	49 (94.2%)	0.104
Charlson Index – Median (IQR)	2 (2–3)	2 (2–3)	0.215

Clinical Features and Outcomes			
Source of bacteraemia – n (%)	286 (74%)	34 (57.6%)	0.007
Abdominal infection	115 (30%)	14 (23.7%)	0.328
Respiratory infection	28 (7.3%)	2 (3.4%)	0.404
APACHE II – Median (p25–75)	13 (9–17)	12 (8–17)	0.164
PITT Score – Median (p25–75)	0 (0–2)	1 (0–2)	0.396
Shock – n (%)	83 (21.6%)	30 (51%)	<0.001
Inadequate empirical treatment – n (%)	32 (8.3%)	31 (52.5%)	<0.001
30 days–Mortality – n (%)	68 (17.7%)	32 (54.2%)	<0.001

Microbiologic Characteristics

<i>Escherichia coli</i>	204 (46%)
<i>Klebsiella</i> spp.	182 (41.1%)
<i>Enterobacter</i> spp.	35 (7.9%)
MDR – Enterobacteriaceae	171 (38.6%)
KPC – CPE	52 (11.7%)

Antibiotic Resistance Profile



Risk factors for CRE Bacteraemia (Logistic Regression Model)

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	p-value
Previous colonization with KPC – CPE	10.6 (4.4 – 25.5)		
Previous carbapenem use	4.1 (2.3 – 7.7)		
Recent antibiotic use (>7 days)	4.6 (2.6–8.1)	4 (1.8–9)	0.001
Recent colonization with KPC–CPE	24.9 (11.3–55)	40.5 (11.6–141.7)	0.0001
Neutropenia	3.6 (1.6–8.2)	2.9 (1–8.6)	0.049
Prior ICU admission	3 (1.4–6.8)		
Central venous catheter	3.4 (1.7–6.7)		
≥ 10 days of hospitalization until bacteraemia	4.4 (2.3–8.6)	2.75 (1.2–6.2)	0.015

Conclusions:

We identified four risk factors for CRE bacteraemia that have to be taken into account when selecting the empirical antibiotic of this population. Because recent colonization with KPC–CPE was the strongest one, we suggest systematic surveillance as part of the routine clinical practice.