

Bacteraemia due to Enterobacteriaceae in cancer patients: aetiology, clinical features and outcome depending on antimicrobial resistance – data from the ROCAS study

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Background:

Clinical and microbiological features, as well as mortality of Enterobacteriaceae bacteraemia in cancer and hematopoietic stem cell transplant (HSCT) patients, may differ depending on the antibiotic resistance profile.

Materials/methods:

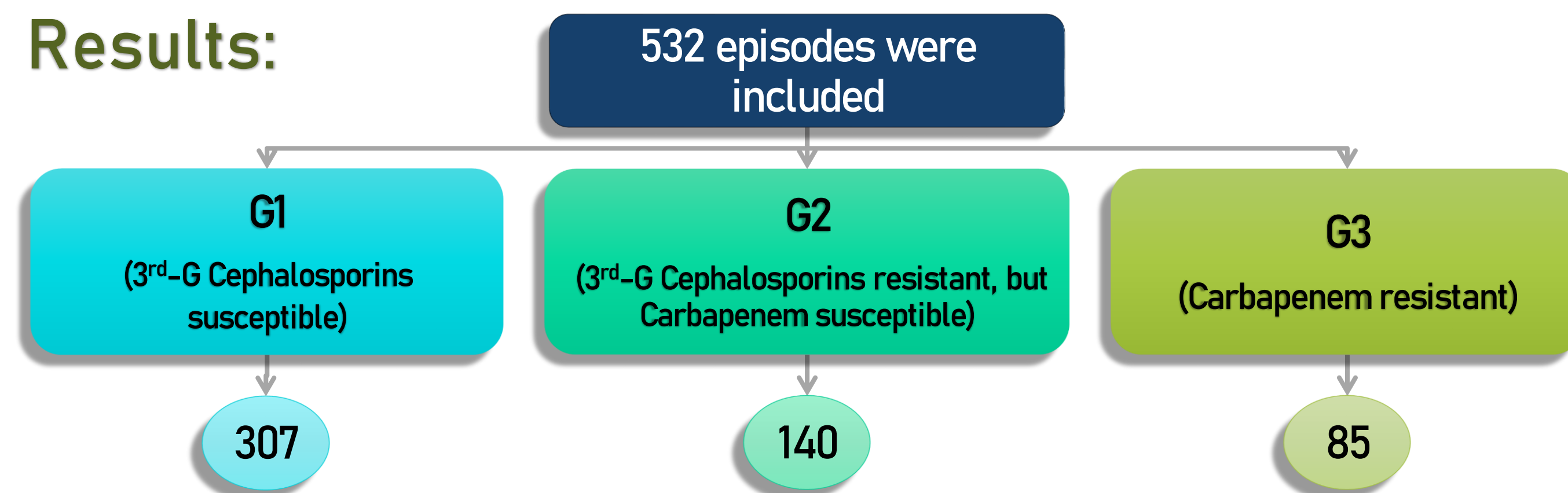
Prospective, multicenter study.

Episodes of bacteraemia due to Enterobacteriaceae in adult cancer and HSCT patients were included in 12 centers in Argentina, from May 2014 to June 2018.

We compared bacteraemia episodes without resistance to 3rd generation cephalosporin (G1) vs episodes with resistance to 3rd generation cephalosporin (G2) vs episodes with resistance to carbapenems (G3).

To identify factors associated with 30-day mortality, variables with $p < 0.05$ in univariate analysis were included in a logistic regression model for multivariate analysis.

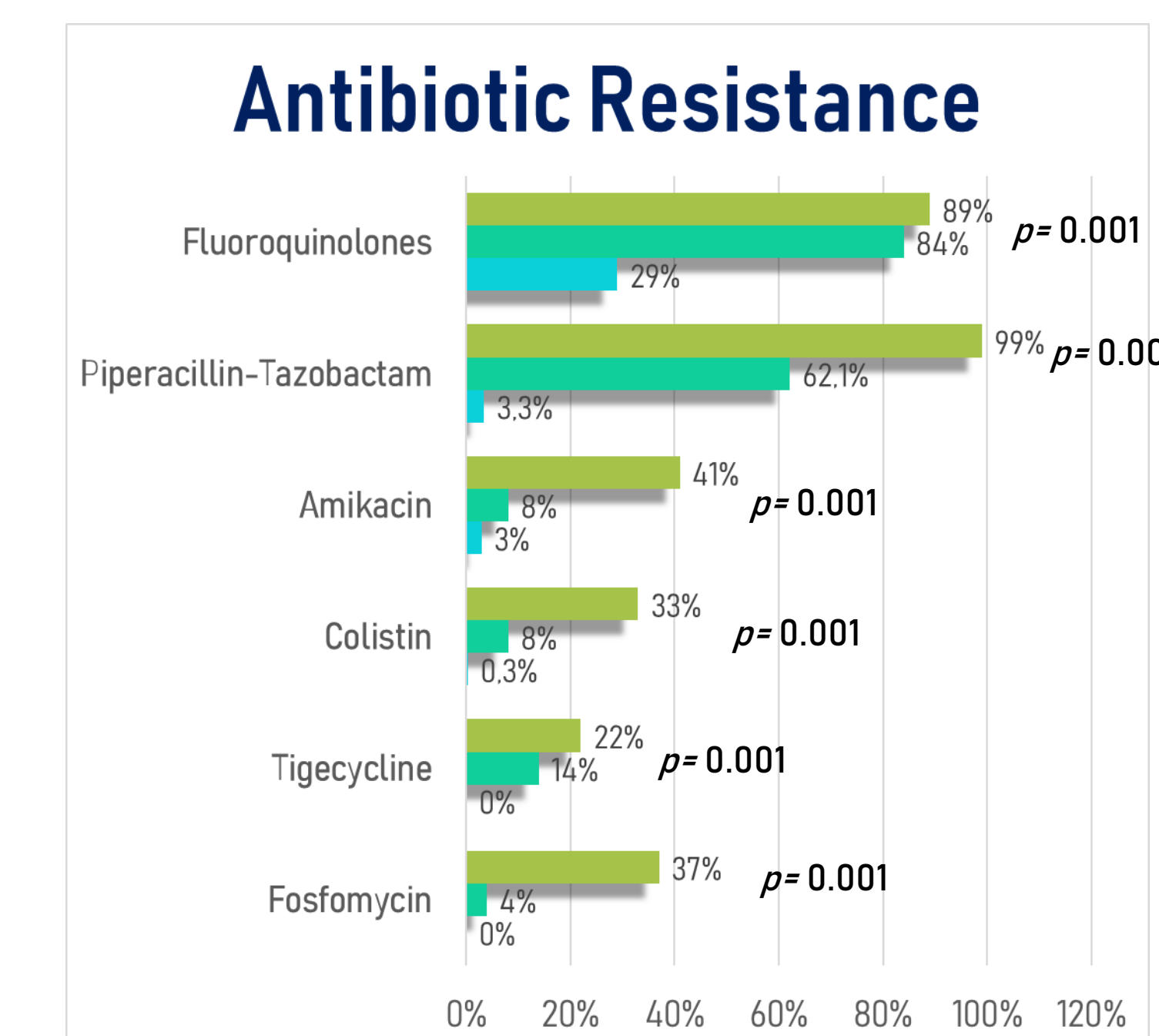
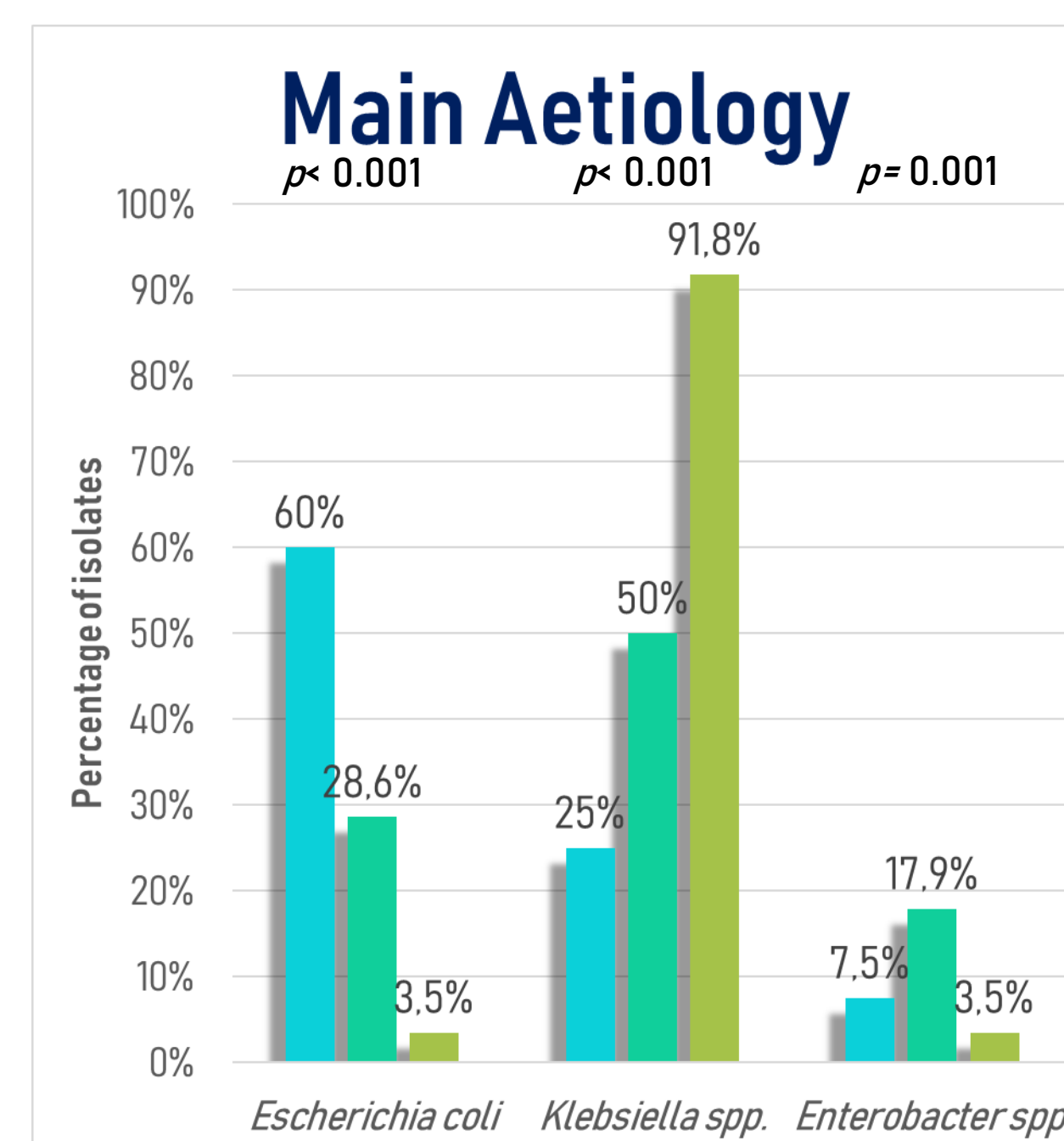
Results:



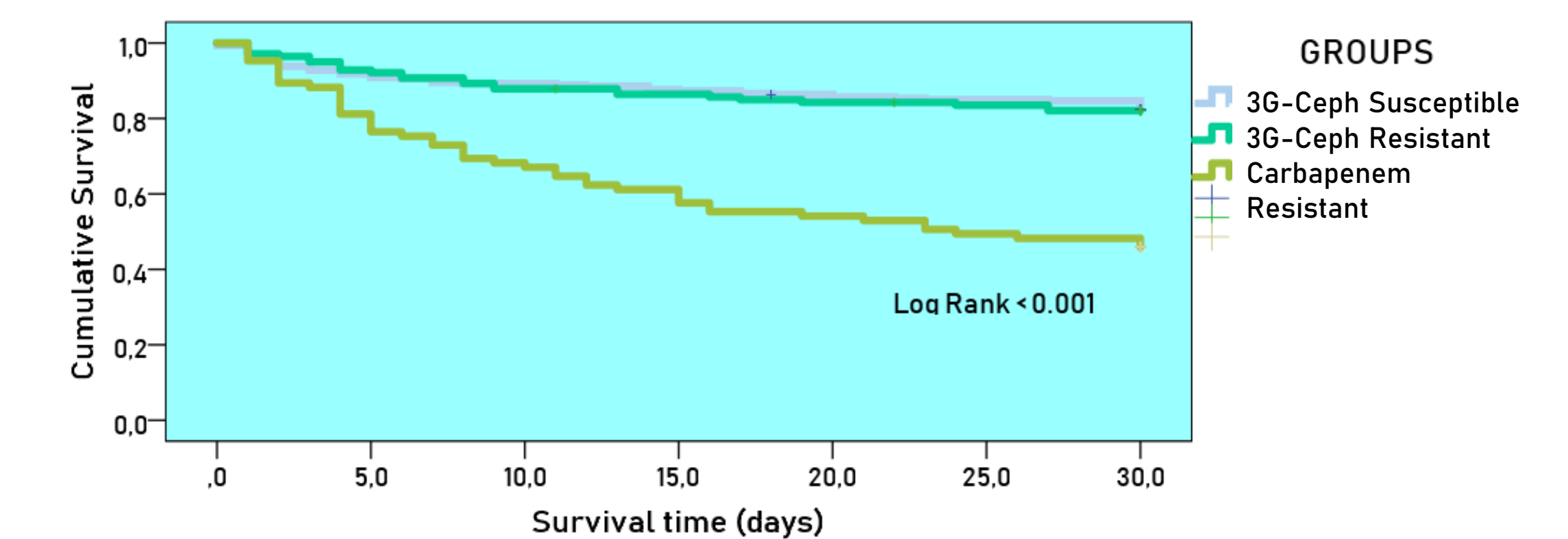
Baseline Characteristics				
	G1	G2	G3	p
Age – Median (p25-75)	56 (37-66)	51 (33-65)	50 (39-63)	0.095
Male Gender – n (%)	162 (52.8)	85 (60.7)	51 (60)	0.211
Hematologic Neoplasm (non-HSCT) – n (%)	179 (58.3)	95 (67.9)	57 (67.1)	0.093
HSCT – n (%)	56 (18.2)	24 (17.1)	24 (28.2)	0.085
Solid Tumor – n (%)	72 (23.5)	21 (15)	4 (4.7)	<0.001
Leukemia – n (%)	109 (46.4)	71 (59.7)	51 (63)	0.009
Lymphoma – n (%)	81 (34.5)	28 (23.5)	20 (24.7)	0.058
Relapsed disease – n (%)	79 (25.7)	31 (22)	11 (12.9)	0.044
Charlson Index >4 – n (%)	82 (26.7)	18 (12.9)	13 (15.3)	0.001
APACHE II Score – Median (p25-75)	13 (10-17)	13 (9-17)	12 (8-16)	0.163
PITT Score – Median (p25-75)	0 (0-2)	0 (0-2)	1 (0-2)	0.492
Neutropenia – n(%)	197 (64.2)	107 (76.4)	72 (84.7)	<0.001
Neutropenia >10 days – n (%)	114 (57.9)	74 (69.2)	56 (77.8)	0.006
High risk (MASCC Score) – n (%)	166 (84.3)	97 (90.7)	68 (94.4)	0.045

Clinical Features and Outcomes

	G1	G2	G3	p
Identified source of bacteraemia–n(%)	225 (73.3)	106 (75.7)	55 (64.7)	0.181
Abdominal infection	96 (31.3)	37 (26.4)	24 (28.2)	0.559
Catheter-related infection	32 (10.4)	17 (12.1)	12 (14.1)	0.612
Respiratory infection	19 (6.2)	14 (10)	5 (5.9)	0.325
Appropriate empirical antibiotic therapy – n (%)	292 (95.1)	117 (83.6)	49 (57.6)	< 0.001
Shock – n (%)	61 (19.9)	33 (23.6)	39 (45.9)	< 0.001
ICU admission – n (%)	68 (22.1)	20 (20.7)	39 (45.9)	<0.001
7 day–Mortality – n (%)	37 (12.1)	14 (10)	33 (38.8)	<0.001
30 day – Mortality – n (%)	54 (17.6)	25 (17.9)	46 (54.1)	< 0.001



Survival



Factors associated with 30 days–Mortality

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	p
Recent steroid use	1.9 (1.2-2.9)		
Breakthrough bacteraemia	3 (1.6-6.7)		
3rd G–Ceph Resistant Enterobacteriaceae	2.2 (1.4-3.3)		
Carbapenem Resistant Enterobacteriaceae	5.5 (3.3-9.2)	7.4 (3.4-15.9)	<0.001
Charlson Index ≥ 4	1.8 (1.1-2.9)		
APACHE II Score ≥ 16	2.1 (1.3-3.2)		
PITT Score ≥ 4	7.4 (3.9-14.1)		
High risk neutropenia (MASCC Score)	3.8 (1.3-14.9)		
Respiratory source of bacteraemia	4.6 (2.2-9.7)	3.9 (1.1-13.8)	0.03
Nosocomial infection	1.8 (1.1-2.9)		
Inadequate empirical therapy	2.1 (1.2-3.7)		
ICU admission	11.8 (7.2-19.3)	3.08 (1.3-7.3)	0.01
Shock	16.9 (10.1-28.3)	9.01 (3.8-21.5)	<0.001
Refractory cancer	2.8 (1.6-4.9)	8.1 (3.2-20.3)	<0.001

Conclusions:

Bacteraemia due to Enterobacteriaceae had different characteristics depending on antibiotic resistance profile. Having carbapenem-resistant Enterobacteriaceae was an independent risk factor for mortality. It is essential to identify patients at risk and treat them appropriately.