EPIDEMIOLOGY AND CLINICAL IMPACT OF BACTEREMIA IN NEUTROPENIC AND NONNEUTROPENIC PATIENTS WITH CANCER AND STEM-CELL TRANSPLANT IN THE ERA OF MULTIRESISTANCE

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BACKGROUND

The characteristics and outcomes of bacteremia in cancer and Stem Cell Transplant (SCT) patients can be different depending if the episode occurs during neutropenia.

OBJECTIVES

To describe and compare the characteristics and outcomes of episodes of bacteremia in patients with cancer and SCT, depending if the episode occurs in patients with neutropenia vs without neutropenia.

METHODS

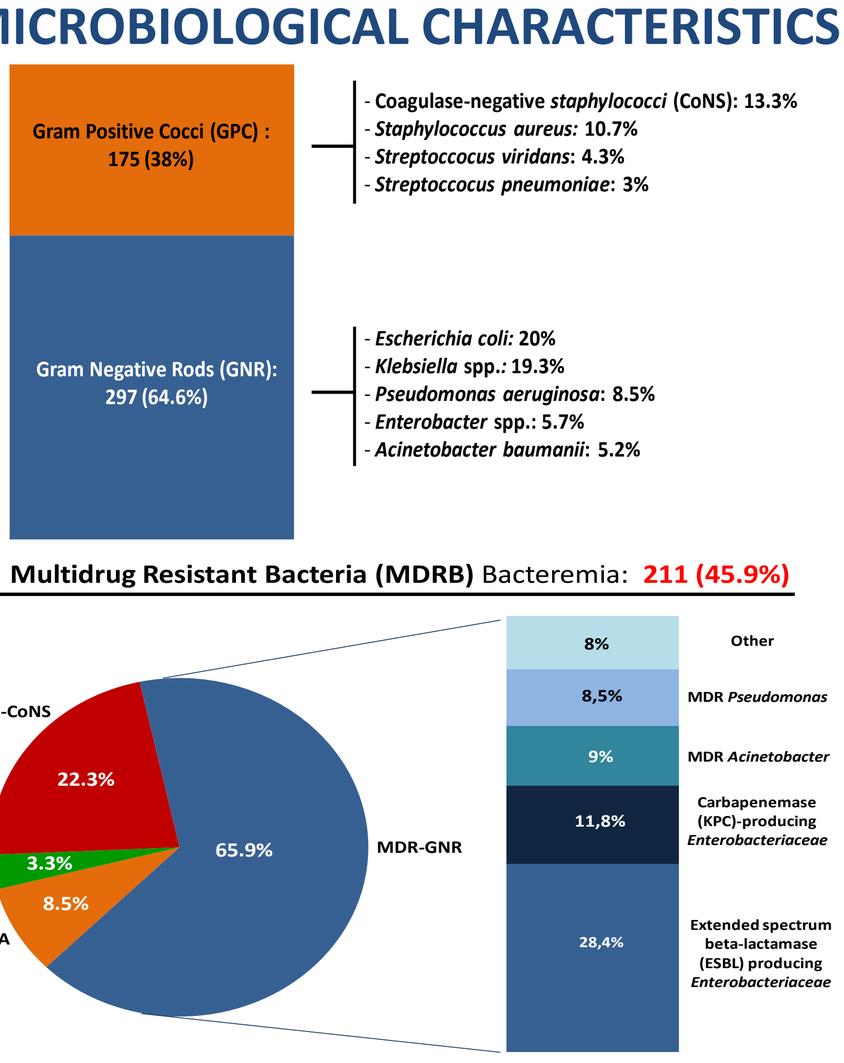
Prospective, multicenter study. Episodes of bacteremia in adults patients with cancer and SCT were included in 10 centers of Argentina specialized in treating these patients, from July 2014 to January 2016. We compare the patients with neutropenia (G1) vs patients without neutropenia (G2). Categorical variables were analyzed by the Fisher exact test or the Chi-square test as appropriate, and continuous variables were analyzed by the U Mann-Whitney test. The 30-day mortality was examined by the Kaplan-Meier method with the log-rank test and the Cox regression model used to test statistical significance.

RESULTS

460 episodes of bacteremia in 398 patients were included:

Hematological tumor (HT): 291 (63.3%) - Solid tumor (ST): 79 (17.2%) – SCT: 90 (19.6%)

MICROBIOLOGICAL CHARACTERISTICS



Multidrug Resistant Bacteria (MDRB) Bacteremia: **211 (45.9%)**

CLINICAL CHARACTERISTICS

Neutropenia (G1): 289 episodes (62.8%)

High risk: 90,7% (CV) – 84.8% (MASCC) / Length (median)**: 13 days**

- **More GNR bacteremia (70.6 vs 54.4%, *p=0.0001*)**
- **More MDRB bacteremia (54.3 vs 31.6%, *p=0.0001*)**
- **More ESBL-*Enterobacteriaceae* bacteremia (17.6 vs 5.3%, *p=0.0001*)**
- **More abdominal infections (34.3 vs 15.8%, *p=0.0001*)**
- **More mucositis as source of infection (10.8 vs 2.3%, *p=0.003*)**
- **Higher median Apache II scores (13 vs 12, *p=0.0001*)**

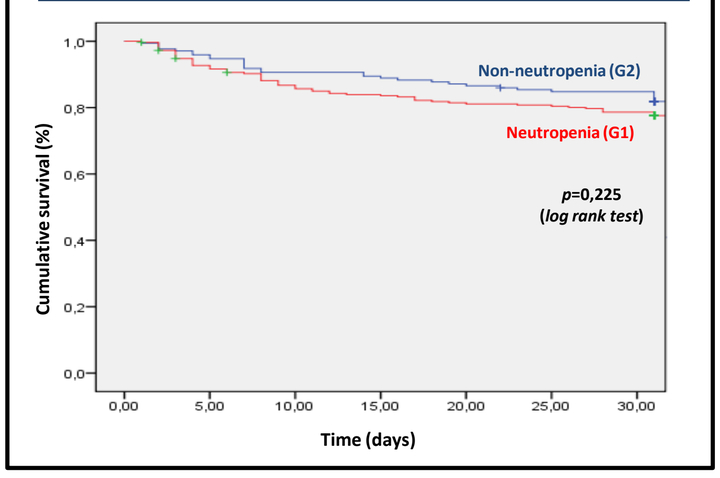
Without Neutropenia (G2): 171 episodes (37.2%)

- **Older patients: age** (median) **(55 vs 49 years, *p=0.0001*)**
- **More frequent ST as underlying disease (33.3 vs 7.6%, *p=0.0001*)**
- **More GPC bacteremia (48.5 vs 31.8%, *p=0.0001*)**
- **More MRSA bacteremia (7 vs 2.4%, *p=0.017*)**
- **More urinary tract infections (18 vs 1.9%, *p=0.0001*)**

TREATMENT AND OUTCOMES

Variable	G1	G2	p
Adequate empirical antibiotic treatment	**210 (72.7%)**	**139 (81.3%)**	***0.037***
Empirical carbapenem use	**127 (43.9%)**	**49 (28.7%)**	***0.001***
Empirical colistin use	**63 (21.8%)**	**16 (9.4%)**	***0.001***
Combined antibiotic treatment	83 (28.7%)	38 (22.2%)	*0.126*
Breakthrough bacteremia	**40 (13.8%)**	**10 (5.8%)**	***0,008***
Intensive care unit requirement	61 (21.1%)	29 (17%)	*0.278*
Shock	**68 (23.5%)**	**26 (15.2%)**	***0.003***
7-day mortality	**48 (16.6%)**	**16 (9.4%)**	***0.03***
30-day mortality	**65 (22.5%)**	**32 (18.7%)**	***0.225***
30-day mortality associated with infection? (n=96)	**52 (81.3%)**	**14 (43.8%)**	***0.0001***
Hospital length of stay (days) (median, P25-75) (n=458)	**28 (17-39)**	**14 (9-32)**	***0.0001***

OUTCOMES – 30-day mortality



30-day mortality: risk factors

Risk factor	UNIVARIATE		MULTIVARIATE	
	HR (IC95%)	p	HR (IC95%)	p
Age (years)	0.9 (0.9-1)	*0.48*		
High Charlson score (>4)	**2 (1.3-3.3)**	***0.002***	1.7 (0.9-3.3)	*0,09*
Solid tumor	**1.86 (1.18-2,9)**	***0.008***	1.9 (0.9-3.8)	*0.06*
Recently diagnosed disease	1.38 (0.9-2)	*0.126*		
Disease in complete remission	**0.5 (0.2-0.9)**	***0.045***	0.7 (0.3-1.2)	*0.177*
Refractory / relapsed disease	1.2 (0.7-1.8)	*0.38*		
High APACHE II score (>24)	**4.5 (2.6-8.1)**	***0.0001***	**3.57 (1.9-6.6)**	***0.0001***
High PITT score (>4)	**5.3 (3.1-8.9)**	***0.0001***	**3.88 (2.25-6.7)**	***0.0001***
MDRB bacteremia	**2 (1.3-3.3)**	***0.001***	**2.29 (1.46-3.6)**	***0.0001***
Neutropenia	**1.29 (0.8-1.9)**	***0.231***	1.4 (0.88-2.3)	*0.152*
Bacteriemia with clinical source	1.2 (0.7-1.9)	*0.398*		
Breakthrough bacteriemia	**1.7 (0.9-2.9)**	***0.059***	1.58 (0.88-2.8)	*0.121*
Adequate empirical treatment	0.7 (0.4-1)	*0.11*		
Nosocomial infection	1.4 (0.9-2.2)	*0.126*		

CONCLUSIONS

The episodes of bacteremia in cancer and SCT patients that occurred during neutropenia had different characteristics and higher severity compared to patients without neutropenia. Despite this, 30-day mortality was similar in both groups. Since MDRB bacteremia was associated with higher mortality, every effort should be done for identifying patients at risk and treating them accordingly.

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