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Title: Bacteremia in patients with cancer and stem-cell transplant: characteristics of health-care associated infections

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Background:
The clinical and microbiological characteristics of bacteremia in cancer and Stem Cell Transplant (SCT) patients can be different depending on the site of onset and acquisition of the infection. The objective of this study was to describe and compare the characteristics of episodes of bacteremia in these patients, depending if the episode was community-acquired, healthcare associated or hospital-acquired, according to the CDC definitions.

Material / Methods:
Prospective, multicenter study. Episodes of bacteremia in adult patients with cancer and SCT were included in 10 centers of Argentina, from May 2014 to July 2016. We compare the patients with community-acquired infections (G1) vs healthcare associated infections (G2) vs hospital-acquired infections (G3). Categorical variables were analyzed by the Fisher exact test or the Chi-square test as appropriate, and continuous variables were analyzed by the Kruskal-Wallis test.

Results:
585 episodes of bacteremia were included, 357 (61%) had hematological tumor (HT), 104 (17.8%) had solid tumor (ST) and 124 (21.2%) had received an SCT. Gram Negative rods (GNR) were isolated in 387 episodes (66.2%), being *Escherichia coli* (21.7%), *Klebsiella* spp. (20.9%) and *Pseudomonas aeruginosa* (8.4%) the most frequent. In 211 (36.1%) Gram Positive cocci (GPC) were identified, being Coagulase-negative *staphylococci* (CoNS) (13%) and *Staphylococcus aureus* (SA) (10.4%) the most common. 261 episodes (44.6%) had Multidrug Resistant Bacteria (MDRB), being the most frequent extended spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* (31.4%), multidrug-resistant CoNS (20.3%), carbapenemase (KPC)-producing *Enterobacteriaceae* (12.6%), methicillin-resistant SA (8.8%), multidrug resistant *Pseudomonas aeruginosa* (8%) and multidrug resistant *Acinetobacter* spp (7%). Fifty-nine episodes (10.1%) were in G1, 130 (22.2%) in G2 and 396 (67.7%) in G3. Clinical characteristics were similar in the three groups, although the proportion of ST as an underlying disease was different (G1: 50.8% vs G2: 23.8% vs G3: 10.9%, p=0.0001) and the frequency of neutropenia was higher in G3 (G1: 39% and G2: 42.3% vs G3: 77.3%, p=0.0001). Frequency of MDRB bacteremia was: G1: 6.8% vs G2: 31.5% vs G3: 54.5%, (p=0.0001), having G3 the highest proportion of ESBL-producing *Enterobacteriaceae* (G1: 5.1% vs G2: 6.9% vs G3: 17.7%, p=0.001) and KPC-producing *Enterobacteriaceae* (G1:0% vs G2: 1.5% vs G3: 7.8%, p=0.004). Multidrug-resistant CoNS were more common in G2 (G1:1.7% vs G2:13.8% and G3:8.6%, p=0.022).

Empiric antibiotic therapy was appropriate in similar proportion in G1 (91.5%) and G2 (81.5%) although lower in G3 (70.2%, p=0.0001). Intensive care requirement, development of shock and 30-day mortality were similar in the three groups, having G3 a longer hospital stay (median) (G1:11 and G2:11 vs G3:31 days, p=0.0001).

Conclusions:
Although health-care associated bacteremias had distinctive microbiological features, in the case of multidrug resistant GNR the profile was similar to community-acquired infections. These findings must be taken into account when choosing the empirical treatment.

Key words: bacteremia, cancer, health-care infections