



Incidence and Outcome of Gram Negative Blood Stream Infections in Pediatric Intensive Care Unit: a Real Life Experience in a Pediatric Hospital in Italy

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Introduction

Antimicrobial resistance (AMR) among Gram Negative (GN) bacteria is a medical and economic concern. In the pediatric setting there is a paucity AMR data due to a lower surveillance in this population.

Aim of this study is to describe incidence and outcomes of GN bloodstream infections (GN-BSI), especially caused by MDR among children admitted to intensive care unit of Istituto Giannina Gaslini Pediatric Hospital in Genoa from January 2017 to December 2021.

Methods

In this retrospective observational single-center study all pediatric patients admitted to ICU with GN-BSI were enrolled. We collected demographical and clinical data (such as underlying disease, empiric and targeted therapy, presence of devices, prior colonization due to MDR GN, prior treatments and surgery), and outcome and mortality at 7 and 30 days.

Results

Overall, 97 GN-BSI among 85 children admitted to PICU were included during the study period.

Among all patients 40% (34/85) were male, with median age of 3 months (IQR: 1; 11; range: 0-292) and 75% (64/85) were aged < 1 years). Rates of GN BSI according to 1000 admission are showed in figure 1.

The major causative agent was *Klebsiella pneumoniae* (28/97, 29%), followed by *Escherichia coli* (18/97, 18%), while 10 episodes (10%) were due to *Pseudomonas aeruginosa* (figure 2).

A mechanism of resistance was found in 22/97 (23%), with a prevalence of ESBL producers (13/22, 59%), followed by AmpC (4/22, 18%) and KPC (2/22, 1%). 14/97 patients (14%) had a surveillance swab positive by the same bacteria causing BSI. The susceptibility to the 4 more used drugs for 4 more frequent pathogens are showed in figure 3.

In 40% of GN-BSI the empiric therapy was piperacillin/tazobactam, followed by carbapenem in 28/98, 28% of episodes.

Overall, 18 (21%) patients died, half of whom within 7 days of the BSI, including 3/6 of the onco/hematological patients.

Figure 1: Rates of GN-BSI between 2017 to 2021

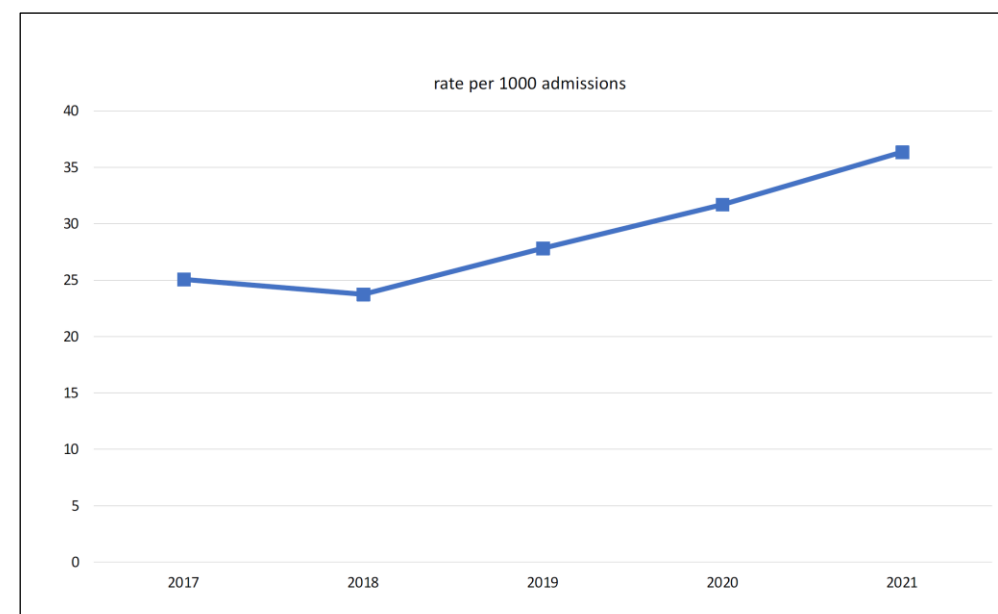
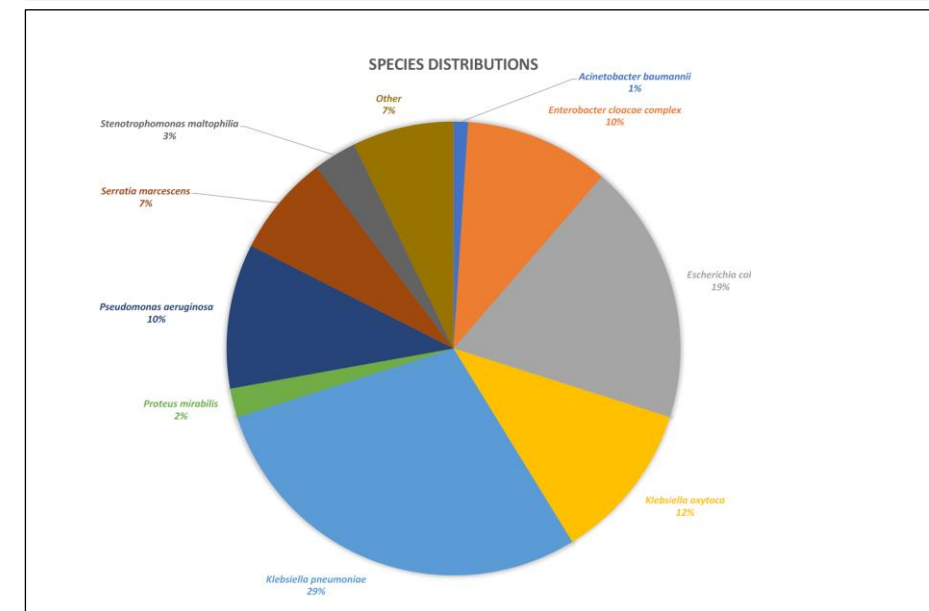


Figure 2: Distribution of species causing blood stream infections



Conclusions

- This study confirmed the increasing role of GN in BSI and high mortality among children admitted to PICU, especially the youngest, with an increased rate in our Center
- Carbapenem resistance isn't common, but the empirical treatment with piperacillin/tazobactam often it might be useless.

Figure 3: Antibiotics susceptibility of most frequent pathogens

