

ASSESSMENT OF THE WIDE-RESISTANT *PSEUDOMONAS AERUGINOSA* OUTBREAK AT A UNIVERSITY HOSPITAL IN BRAZIL: HAVE WE LOST THIS WAR?!

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BACKGROUND

Resistance profile analysis in *Pseudomonas aeruginosa* isolates is extremely important to prevent its transmission and to detect outbreaks. Broadly resistant strains (BR) have a high mortality rate in invasive infections. By analyzing the clinical and microbiological characteristics of these infections, one can define more effective actions in a nosocomial outbreak setting in a university hospital in Brazil.

METHODS

From January to September 2019, 13 patients from the oncohematology services and intensive care unit (ICU) followed by the stewardship program of a public university hospital in Brazil had *Pseudomonas aeruginosa* (PsA) BR infection.

- **Multidrug-resistant (MDR):** resistant to three or more antimicrobial classes;
- **Extensively-resistant (XDR):** sensitive to a maximum of two antimicrobial classes;
- **Pandrug-resistant (PDR)** has been defined as resistant to all antimicrobial classes.¹

Bacterial samples were identified by the automated VITEK®2 system (BioMérieux).

The resistance pattern was defined based on the CLSI-M100 2019 criteria.

Colistin sensitivity was assessed by the colistin drop test.²

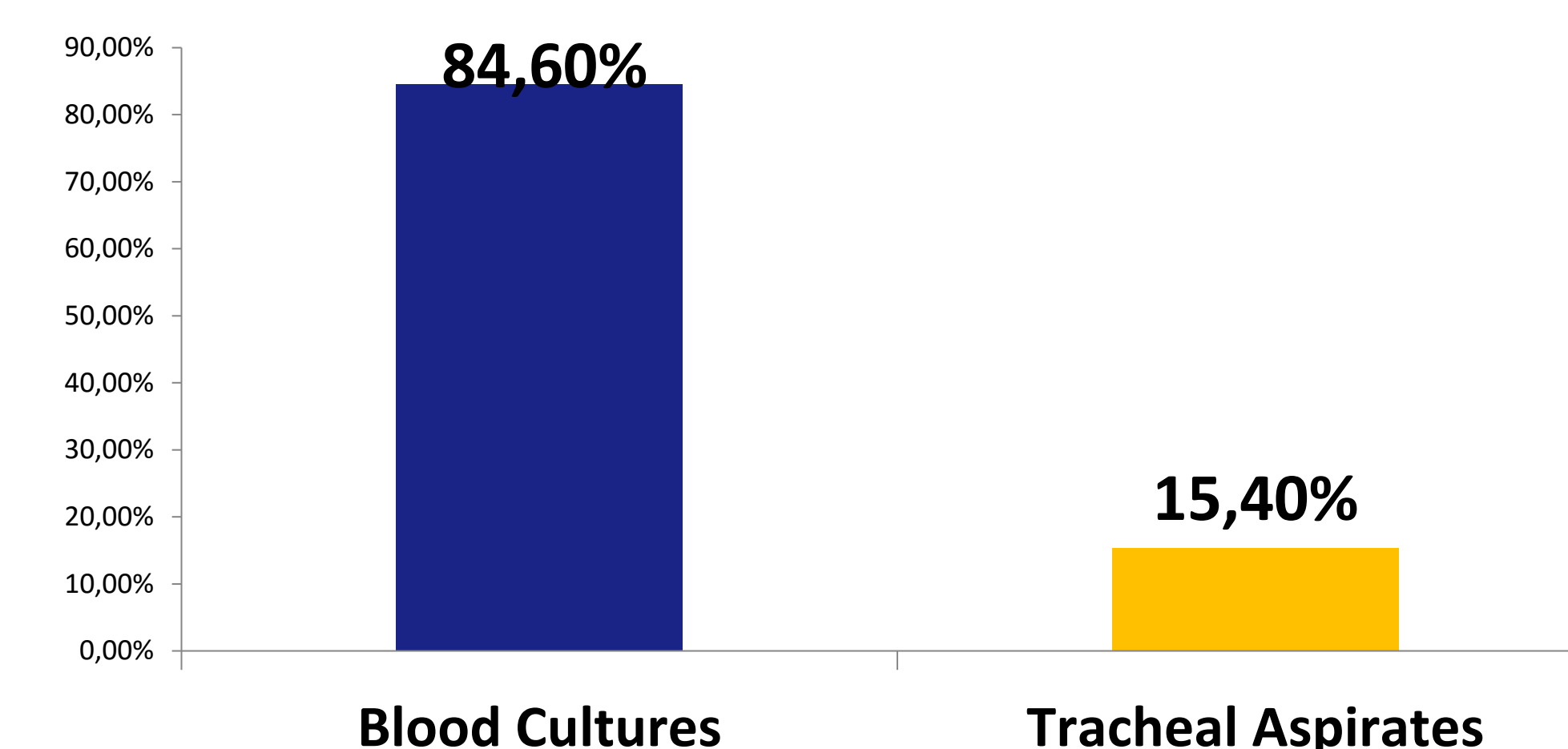
The modified carbapenemic inactivation method (mCIM) was performed by disk diffusion.

- This study was approved by the hospital's research ethics committee (Nº 2.945868)

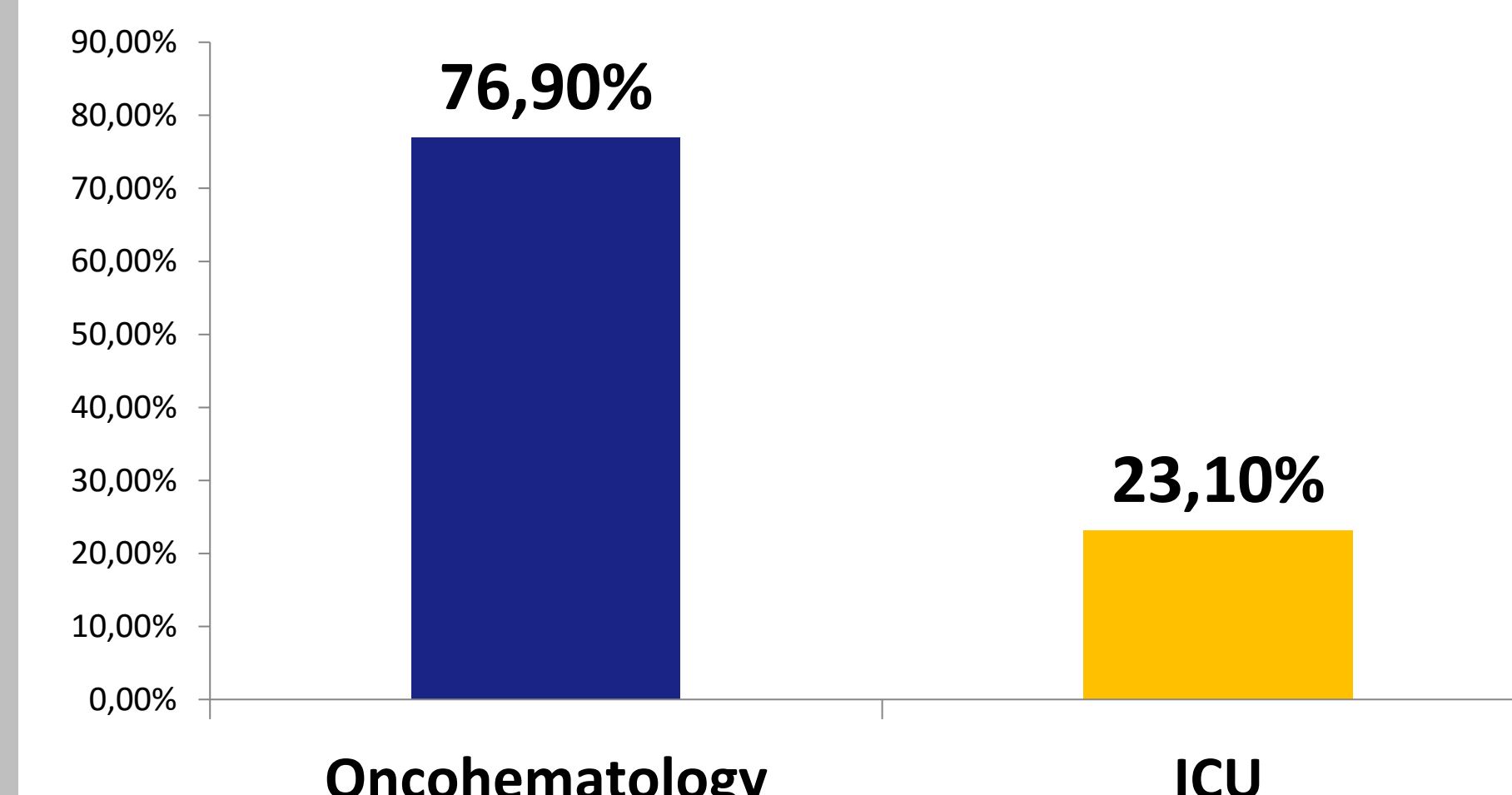
RESULTS

The 13 strains of PsA were isolated from 84.6% (11/13) blood cultures and 15.4% (2/13) tracheal aspirates, being 76.9% (10/13) from the oncohematology unit and 23.1% (3/13) of the ICU. The resistance profile was 23.1% (3/13) strains sensitive to amikacin, gentamicin, ciprofloxacin and colistin (PsA MDR); 61.5% (8/13) colistin-only (PsA XDR) sensitive strains; 15.4% (2/13) strains resistant to all classes (PsA PDR). 69.2% (9/13) of the strains were mCIM positive, in which the therapeutic option was ceftazidime/avibactam in combination with polymyxin. Regarding the sites of infection and use of devices, 53.8% (7/13) of the patients developed the infection after the use of central venous catheter and/or mechanical ventilation. The mortality rate was 76.9% (10/13).

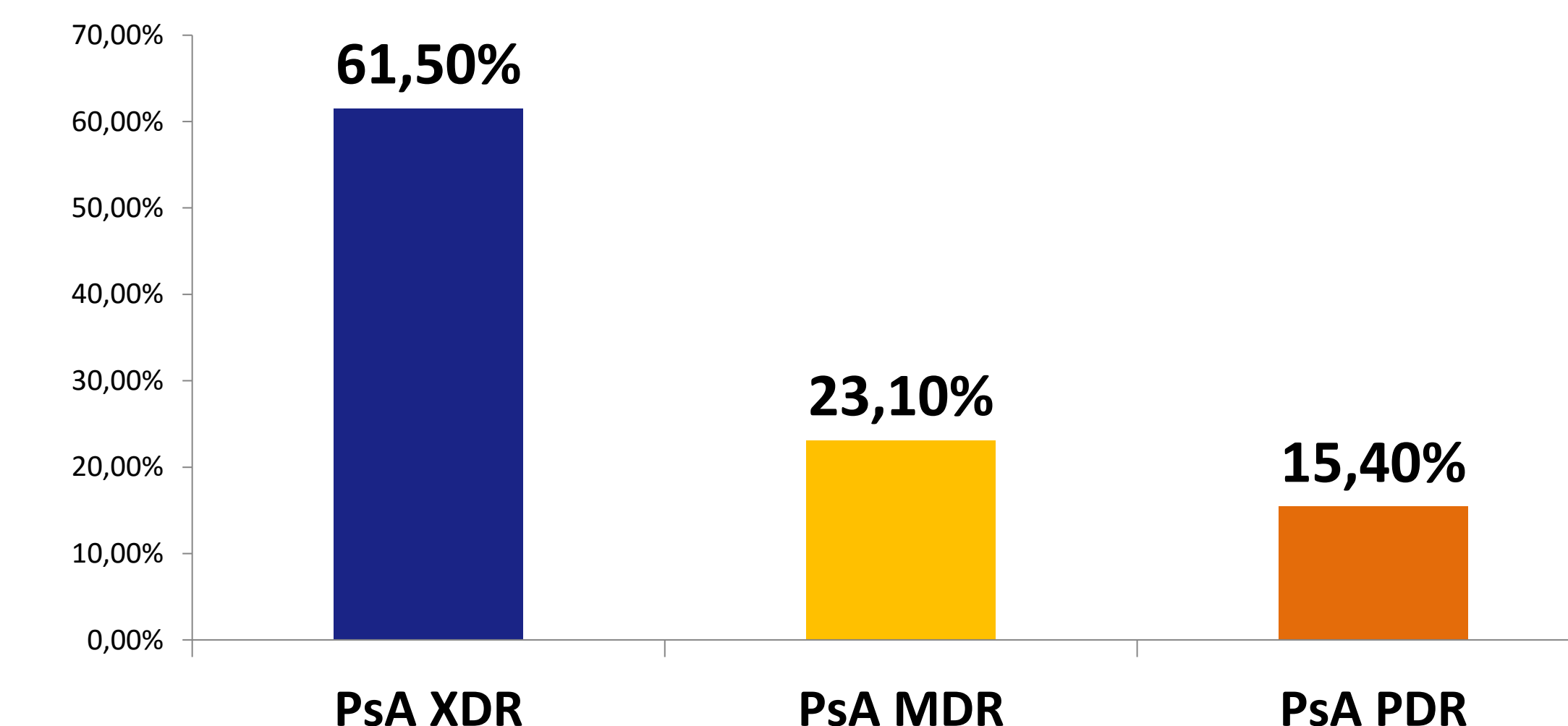
Graphic 1. Site profile of PsA BR strains isolated.



Graphic 2. Units with PsA BR strains isolated.



Graphic 3. Resistance profile of PsA BR strains isolated.



CONCLUSION

The investigation of the outbreak of *Pseudomonas aeruginosa* highlights the importance of infectious surveillance of this pathogen with this resistance profile, to better understand the causalities, minimize its damage and reduce potential recurrence of new outbreaks.

REFERENCES

1. Pearson et al. Consenso latinoamericano para definir, categorizar y notificar patógenos multirresistentes, con resistencia extendida o panresistentes. Rev Panam Salud Publica [Internet]. 2019.
2. Pasteran et al., Development and validation of simple tests (agar spot, colistin drop, 1ml-broth disk elution MIC and tablet pre-diffusion) as an alternative to improve accuracy in screening chromosomal and plasmid-mediated colistin resistance in Gram-negative bacilli. 2018. 28th ECCMID.