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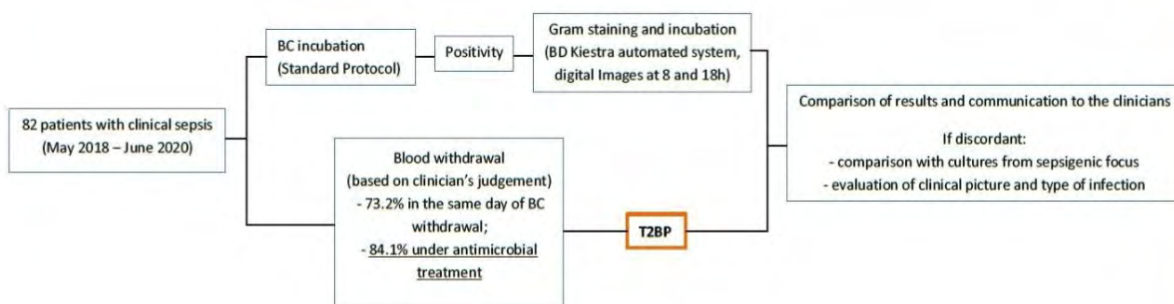
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## PURPOSE / OBJECTIVES

Delay on the appropriate antimicrobial therapy is a well-known and strong predictor of poor outcome in septic patients. Multidrug resistant organisms (MDRO) have reached to a pandemic level during the last 2 decades. Empiric broad-spectrum antimicrobial therapy is often inappropriate in infections due to MDRO, and it is associated with a rising prevalence of antimicrobial resistance. Therefore, rapid identification of bacterial species known to be commonly MDRO is currently one of the major targets of microbiological research.

In this prospective observational study, we analyzed the diagnostic accuracy and the clinical impact of T2Bacteria Panel (T2BP) in 82 patients with sepsis. The panel is capable of identifying ESKAPEc pathogens (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, *Escherichia coli*) directly from a whole-blood sample, in 4.17h. We compared the diagnostic accuracy and time to report (TTR) with blood culture (BC), and analyzed the impact on antimicrobial therapy. Moreover, we compared T2Dx<sup>®</sup> system with LightCyclerR SeptiFast<sup>®</sup>, a multiplex real-time PCR nowadays dismissed, but in use in our laboratories during the period of the study.

## MATERIALS & METHODS

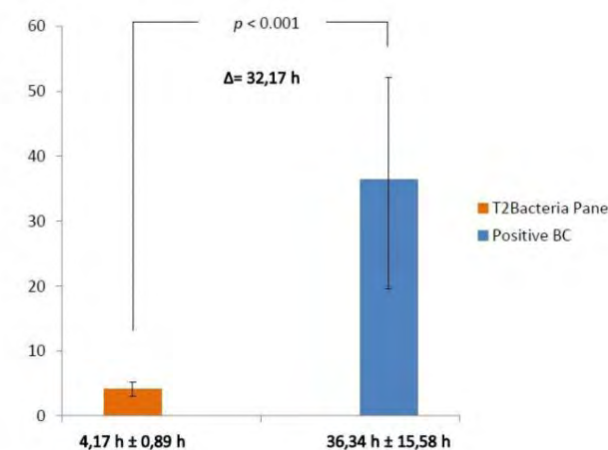


## RESULTS

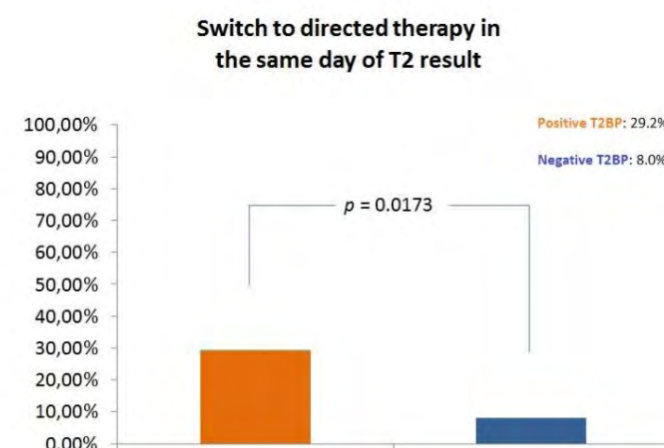
### Diagnostic Accuracy

	Blood culture	T2Bacteria Panel	Considering only ESKAPEc
Sensitivity	57.1% [45.7% - 67.9%]	78.6% [67.9% - 86.6%] ↑	100.0% [94.0% - 100.0%] ↑↑
Specificity	100.0% [94.4% - 100.0%]	96.3% [88.9% - 99.0%]	100.0% [94.0% - 100.0%] ↑↑
PPV	100% [94.4% - 100.0%]	91.7% [82.9% - 96.3%]	100.0% [94.0% - 100.0%] ↑↑
NPV	81.8% [71.4% - 89.2%]	89.7% [80.5% - 95.0%] ↑	100.0% [94.0% - 100.0%] ↑↑

### Time to Report



### Impact on antimicrobial therapy



## SUMMARY / CONCLUSION

T2Bacteria Panel **sensitivity** and **NPV** were **100.0%** in ESKAPEc BSIs (BC sensitivity and NPV were 57.1% and 81.8%, respectively), with 84.1% of patients under antimicrobial treatment at the moment of T2BP sampling

**Time to report** of T2BP results was significantly lower than that of blood culture (**4.17 h** vs 36.34 h)

Empirical therapy in patients with positive T2BP was **switched** to directed therapy in **29.2%** of cases, **on the same day** of T2BP sample drawing. Empirical therapy was changed to directed therapy in 8.0% of patients with negative T2BP results.

## Comparison with Multiplex RT-PCR methods

Technology	Target pathogens	Detection of	LOD	Needing of skilled personnel to be performed	TTR	Sensitivity <sup>1</sup>	Specificity <sup>1</sup>
T2Dx <sup>®</sup>	6	Cells	1-3 CFU/mL	No	4.17 h ± 0.89 h	100.0% [94.0 - 100.0]	96.3% [88.9 - 99.0]
LightCyclerR <sup>®</sup> SeptiFast	25	DNA and Cells	3-30 CFU/mL	Yes	6.0 h*	71.0%** [60.0 - 79.0]	100.0%** [99.0 - 100.0]

LOD: limit of detection; NMR: nuclear magnetic resonance; RP-PCR: real time PCR; TTR: time to report

<sup>1</sup> for pathogen detectable by the instrument.

\* Westh et al., CMI, 2009

\*\* Pasqualini et al., JCM, 2012

**T2Bacteria Panel: ESKAPEc sepsis detected with optimal diagnostic accuracy, time to report, with a positive impact on switch of empirical therapy.**