

Are Vitek2 system and E-test relevant and reliable for determining susceptibility to temocillin?

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Introduction/Background

- Temocillin is a β -lactam increasingly used in serious infections caused by Enterobacteriaceae, including ESBLs and even some carbapenemase-producing strains, as an alternative to carbapenems ⁽¹⁻⁵⁾.
- Therefore, accuracy of *in vitro* minimal inhibitory concentration (MIC) values is of high importance in an era of antibiotic stewardship based on PK/PD.

Objective

- We aim to compare the performance of E-test® and Vitek2® vs. the standard broth microdilution method (BMD) following CLSI recommendations to determine susceptibility to temocillin in Enterobacteriaceae

Material/methods

- 34 isolates were collected from respiratory samples isolated from ICU patients.
- MIC of temocillin were determined in parallel by 3 methods:
 - E-test® (Biomérieux)
 - Vitek2® (Biomérieux)
 - BMD, following CLSI recommendations.
- Since no EUCAST or CLSI breakpoint guidelines exist at this time, susceptibility to temocillin was determined according to breakpoints provided by BSAC (British Society for Antimicrobial Chemotherapy) in order to evaluate categorical agreement (S: MIC \leq 8 mg/L; R: MIC > 8 mg/L) ⁽⁶⁾.
- The production of ESBL or carbapenemase was screened according to the antibiotic susceptibility profile.
 - ESBL expression was confirmed by the double-disc synergy test.
 - Carbapenemase production was established by a colorimetric test detecting the carbapenem hydrolysis or using an immunochromatographic assay.

Results

Isolates included:

- *Klebsiella pneumoniae* (10/34; 29.4%), *Escherichia coli* (10/34; 29.4%), *Serratia marcescens* (6/34; 17.7%), others (8/34; 23.5%).
- Five (14.7%) were ESBL-producers.
- None were carbapenemase-producers.
- 7/34 (20.6%) isolates were resistant to temocillin according to BMD method.

Figure 1. Repartition of MIC values according to different MIC methods used

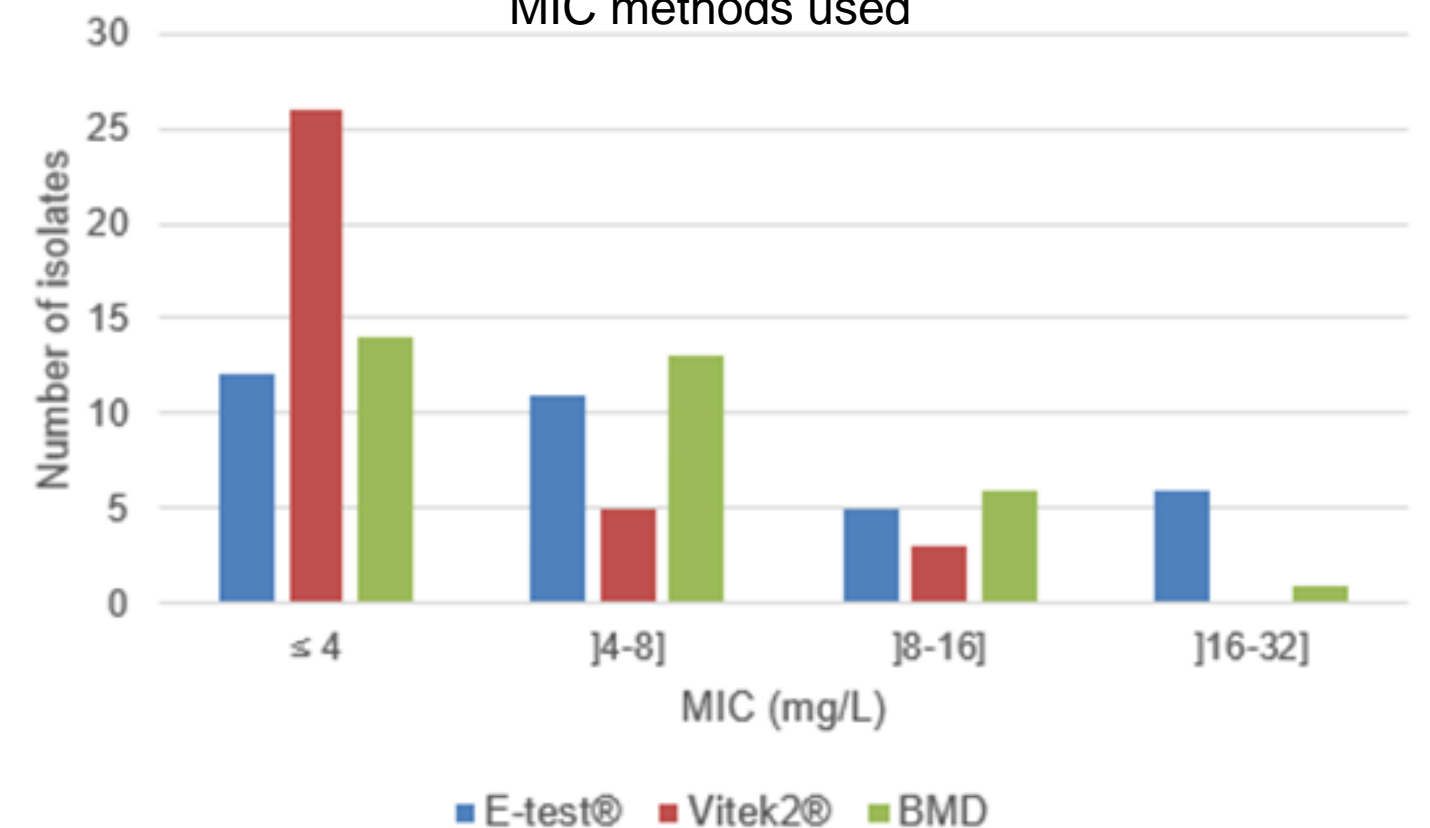


Table 1. Agreement between methods

	Both S	Both R	Concordant results	R by the tested method and S by BMD	S by the tested method and R by BMD
E-test®	22/27 (81.5%)	6/7 (85.7%)	28/34 (82.4%)	5/27 (18.5%)	1/7 (14.3%)
Vitek2®	25/27 (92.6%)	1/7 (14.3%)	26/34 (76.5%)	2/27 (7.4%)	6/7 (85.7%)

Conclusions

Compared to BMD, Vitek2® seems to overestimate sensitivity and underestimate resistance, while E-test® seems to overestimate resistance, pleading for the use of BMD when evaluating susceptibility to temocillin. However, this study, which is currently enrolling more patients, will include more isolates in order to meet FDA criteria set out in Cumitech 31A for validation of method comparison ⁽⁷⁾.

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