Confronted with multi-drug resistant bacteria, physicians often request clinical microbiologists to supply them with synergy testing data. Whereas conventional checkerboard synergy testing could provide such information, this time-consuming and lab-intensive method cannot be performed on a routine basis. This is especially evident when confronted with Gram-negative bacteria such as Acinetobacter baumannii, Pseudomonas aeruginosa or other non-fermentative organisms. We focused here on a panel of multi-drug resistant Acinetobacter baumannii and tested them for potential synergy when exposed to meropenem and colistin, one of the preferred therapeutic combinations.

Methods

We compared checkerboard testing with the Xact™ method (bioMérieux), an approach derived from the E-test susceptibility testing. Briefly, an agar plate seeded with a 0.5 McFarland suspension is overlaid with a square strip impregnated by a gradient concentrations of antibiotic A and a gradient of antibiotic B disposed orthogonally to gradient A. After 1 hour, this Xact™ strip is removed and the pattern of bacterial growth is imaged after 16-20h of growth at 35°C. Inhibition zones can provide the following information: MIC for antimicrobial A, MIC for antimicrobial B and zones of additivity or antagonism effect.

Checkerboard titration and Xact™ testing revealed concordant synergism in 16/25 strains (64%) with two strains being non-conflational to an elevated meropenem MIC. In two strains non-conform results were obtained. Finally, 8/25 (32%) strains were reported as additive in perfect concordance by the two methods. Overall, 22/25 isolates (92%) for which both synergy tests were performed successfully showed full concordance in the comparison between the gold standard method and Xact™.

Conclusions

Xact™ revealed synergic effects for 16/25 strains and showed a very good level of concordance with the checkerboard method. Xact™ method revealed easier to set-up and analyse, allowing to perform three times more analyses during the working time and offering potential for routine synergy testing.