Low Propensity for Development of Resistance to MCB3681, the Active Moiety of Oxacillin (MCB3887), in Gram-Positive Bacteria with Vancomycin-, Linezolid- and/or Ciprofloxacin Resistant
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Abstract

MCB3887 is a novel antibiotic which is structurally related to vancomycin; it has a low propensity for resistance development compared to vancomycin itself. The main objectives of this study were to test the susceptibility of a broad variety of Gram-positive bacteria against MCB3887 and to investigate the emergence of multistep resistance. The susceptibility of various clinical strains and reference strains commonly used in susceptibility testing was determined in a high throughput format. The emergence of resistance against MCB3887 was investigated in different experimental setups: (1) upon repeated exposure of a single bacterial strain to sub-inhibitory concentrations of MCB3681, the active moiety of MCB3887; (2) during the development of resistance against MCB3887 by stepwise increasing the concentration of the antibiotic; (3) in a large-scale study of clinical isolates. In all these tests, MCB3887 showed a better resistance profile compared to vancomycin, linezolid and ciprofloxacin.

Material and Methods

The susceptibility of various clinical and reference strains was determined in a high throughput format. The emergence of resistance against MCB3887 was investigated in different experimental setups: (1) upon repeated exposure of a single bacterial strain to sub-inhibitory concentrations of MCB3681, the active moiety of MCB3887; (2) during the development of resistance against MCB3887 by stepwise increasing the concentration of the antibiotic; (3) in a large-scale study of clinical isolates. In all these tests, MCB3887 showed a better resistance profile compared to vancomycin, linezolid and ciprofloxacin.

Results

The susceptibility of various clinical and reference strains was determined in a high throughput format. The emergence of resistance against MCB3887 was investigated in different experimental setups: (1) upon repeated exposure of a single bacterial strain to sub-inhibitory concentrations of MCB3681, the active moiety of MCB3887; (2) during the development of resistance against MCB3887 by stepwise increasing the concentration of the antibiotic; (3) in a large-scale study of clinical isolates. In all these tests, MCB3887 showed a better resistance profile compared to vancomycin, linezolid and ciprofloxacin.

Conclusion

MCB3887 is a promising new antibiotic with a low propensity for resistance development compared to vancomycin, linezolid and ciprofloxacin.

References