Tigecycline Comparison with Minocycline Resistance Pathogens. A Worldwide Perspective

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0.03 0.12 44.3 100 32 spp (n=1499)
P. aeruginosa

Tigecycline is a novel antibacterial with expanded broad-spectrum activity from a new class of compounds, the glycytycines. Tigecycline inhibits protein synthesis by binding to the 30S ribosomal subunit and thereby inhibiting bacterial protein synthesis. Although it is related to minocycline, it is distinct in that it is less active against some minocycline-resistant pathogens (2-4). Tigecycline has demonstrated significant broad-spectrum activity against select gram-positive and gram-negative microorganisms (2-4).

Unlike the other antibiotics of the tetracyclines or tetracycline-related groups, Tigecycline resistance is very infrequent and is also difficult to induce in the laboratory (3, 6) with a selection frequency of less than 10^{-11} (6). With the acquisition of P. aeruginosa, tetracycline-resistant bacteria with either tetA in the efflux pump or tetrA in the prophage appears to be of increasing importance (2-3). Tigecycline has shown to be a highly effective against multi-resistant Acinetobacter spp., particularly. A majority of those that are commonly encountered with serious nosocomial infections. Similar activity has been observed against enterobacteriaceae, even extended-spectrum beta-lactamase (ESBL) and AmpC producing Enterobacteriaceae (7). Tigecycline has demonstrated MIC ranges of 0.12 mg/L against methicillin-resistant Staphylococcus aureus (MSSA) and other gram-positive organisms (2-4).

This study was designed to define the in vitro activity of tigecycline against minocycline-resistant clinical isolates collected from 484 study centers worldwide.

RESULTS

Table 1. In vitro activity of tigecycline and comparative agents against minocycline-resistant Enterobacteriaceae.

Table 3. In vitro activity of tigecycline and comparative agents against minocycline-resistant gram-positive pathogens.

METHODS

All isolates were derived from blood, respiratory tract, urine (no more than 25% of all isolates), skin, wound, body fluid, and other defined sources. Only one isolate per patient was acceptable into the study. More than 110,519 clinical isolates were collected and tested. Of these, 4,938 from 50 countries globally, 1,028 strains were identified to the species level and tested at each site by the participating laboratory.

All strains were identified to the species level and tested at each site by the participating laboratory. Resistance phenotypes and drug susceptibilities as defined in CLSI document M100-S17, 2007; na=Tigecycline breakpoints not determined for this species.

CONCLUSIONS

Tigecycline demonstrated minimal cross-resistant with minocycline and a variability that was species dependent. There was no cross-resistant with minocycline against E. coli and Acinetobacter species. Tigecycline MICs against minocycline-resistant Klebsiella and Serratia ranged from 4- to 16-fold lower than minocycline. Neither tigecycline nor minocycline demonstrated significant activity against P. aeruginosa.

Tigecycline demonstrated potent in vitro activity against gram-positive strains that are not susceptible to minocycline. More than 97% of all minocycline-resistant staphylococci and enterococci were inhibited by tigecycline at the defined susceptibility breakpoints of 0.5 and 0.25 mcg/mL for staphylococci and enterococci (vancomycin-susceptible, respectively).

The MICs values of tigecycline were 0.5 and 0.12 mcg/mL against the minocycline-resistant fastidious respiratory pathogens, H influenzae and S. pneumo, respectively, including penicillin-resistant S. pneumoniae.

Tigecycline exhibited potent in vitro activity against minocycline-resistant strains and may be considered in such cases where the tetacyclines and their analogs have been previously excluded.

REFERENCES