In vitro Tedizolid Minimum Inhibitory Concentrations (MIC) Against Clinical Isolates of Mycobacterium abscessus

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Background

- At MUSC, Mycobacterium abscessus is the second most common etiology of pulmonary mycobacterial infection and is increasingly recognized as an etiology of skin, soft tissue, surgical site, joint and vascular catheter infections.
- Treatment requires two or three antimicrobials for extended durations; available drug choices are severely limited due to the organism’s inherent resistance.
- Tedizolid is a novel, potent oxazolidinone pro-drug that interacts with the bacterial 23S ribosome initiation complex to inhibit translation.
- It is active against the most common Gram-positive pathogens including staphylococci and enterococci as well as some mycobacteria including RGM such as M. abscessus.
- Among gram positive organisms non susceptible to linezolid, tedizolid MICs are 8- to 16-fold lower than those of linezolid.

Methods

- We conducted a cross-sectional, descriptive study.
- The Diagnostic Microbiology Lab collected M. abscessus clinical isolates during the 2014 calendar year.
- The MICs for tedizolid and linezolid were performed using Research-use-only broth microdilution panels with tedizolid and linezolid (0.06-8 µg/mL) from Thermo Scientific Sensititre.
- For the determination of the MIC, we followed the broth microdilution procedures as described per the Clinical and Laboratory Standards Institute (CLSI) document M24-A2 for Susceptibility Testing of Mycobacteria, Nocardiae, and other aerobic Actinomycetes.
- The microbial suspensions were inoculated on the trays and incubated at 28-30 °C. The trays were examined at 72 hours. Mycobacterium peregrinum ATCC 700686 and Staphylococcus aureus ATCC 29213 were used for quality control.

Results

- A total of thirty eight isolates were tested. Four isolates were excluded due to either contamination on the purity plate, no growth on the MIC plate or both.
- Three isolates had MICs > 8 for both drugs, therefore MICs could not be compared.
- For 31 evaluable paired isolates every isolate was at least 2-fold more susceptible to tedizolid. Forty seven percent of the isolates were 4-fold more susceptible to tedizolid, thirteen percent of patients were 8-fold more susceptible to tedizolid.

Conclusions

- Our data demonstrates that tedizolid is uniformly more active in vitro than linezolid against M. abscessus.
- Tedizolid phosphate has been shown to be statistically non inferior treatment to linezolid in acute bacterial skin and skin structure infections (ABSSSI).
- In vivo efficacy and safety in the treatment of M. abscessus infection has not been established.

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