

Comparison of the *in vitro* activity of tedizolid, linezolid, and vancomycin against *Staphylococcus aureus* isolates collected in China (2013-2014)

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Objectives

Tedizolid (TZD) is a novel oxazolidinone antibiotic under clinical development against infections caused by Gram-positive bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA). TZD is typically at least 4-fold more potent (MIC₉₀: 0.5 µg/mL) *in vitro* than linezolid (MIC₉₀: 2.0 µg/mL) against Gram-positive pathogens, including strains resistant to linezolid or vancomycin. TZD has recently been approved in the US for the treatment of patients with acute bacterial skin and skin structure infections (ABSSSIs). A Phase III study in patients with ABSSSI is ongoing in China. The current surveillance study presented here was undertaken to analyse the activity of TZD in comparison with linezolid and vancomycin against *S. aureus* in order to monitor trends in antibacterial susceptibility in China.

Methods

A total of 663 *S. aureus* isolates were collected from 10 sites across China between 2013 and 2014. Isolates were obtained from Chinese patients with skin and soft tissue, respiratory tract, bloodstream, or other sites of infections. Broth microdilution testing using frozen panels according to CLSI guidelines was performed at IHMA laboratories in the US. *In vitro* activity of TZD, linezolid, and vancomycin was tested by evaluating minimum inhibitory concentration values (MICs).

Results

Of the 663 *S. aureus* isolates collected, 425 were MRSA and 238 were methicillin-susceptible *S. aureus* (MSSA). TZD demonstrated high *in vitro* activity against *S. aureus* with equal potency against both MRSA and MSSA, producing MICs ranging from 0.12 to 0.5 µg/mL and MIC₉₀ values of 0.5 µg/mL (Table 1). Against both MSSA and MRSA, TZD was 2-fold more potent than vancomycin and 4-fold more potent than linezolid based on MIC₉₀ values (Table 1). Using FDA breakpoints, all *S. aureus* isolates were susceptible to tedizolid.

Table 1.	TZD			LZD			VAN		
	MIC ₉₀ (µg/mL)	Range (µg/mL)	S (%)	MIC ₉₀ (µg/mL)	Range (µg/mL)	S (%)	MIC ₉₀ (µg/mL)	Range (µg/mL)	S (%)
<i>S. aureus</i> (All) (N=663)	0.5	0.12-0.5	100	2	0.5-4	100	1	≤0.25-2	100
MRSA (N=425)	0.5	0.12-0.5	100	2	0.5-4	100	1	≤0.25-2	100
MSSA (N=238)	0.5	0.12-0.5	100	2	0.5-4	100	1	≤0.25-2	100

S: susceptible; LZD: linezolid; TZD: tedizolid; VAN: vancomycin

Conclusion

TZD was highly potent against *S. aureus* in China, showing equal potency against both MRSA and MSSA, and was 2–4-fold more potent than vancomycin or linezolid. The results were similar to those previously reported among isolates from other regions including the US, Europe, Latin America, and Pacific Rim.