Activity of Linezolid Against Global Isolates of *Streptococcus pneumoniae* (SPN) Including Resistant Phenotypes

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**Revised Abstract**

**Background:** Linezolid is a semi-synthetic antibiotic approved for the treatment of skin and bone infections. This study describes the activity of linezolid and comparators against *Streptococcus pneumoniae*, an important etiologic agent of both community and hospital acquired pneumonia. 

**Methods:** 10,980 clinical isolates of SPN were collected worldwide between 2004 and 2009 from a variety of clinical sources including blood and lower respiratory tract. MICs were determined and interpreted by broth microdilution according to CLSI/FDA guidelines. 

**Results:** The following table reports the percent susceptible of SPN including resistant phenotypes.

| Drug          | MIC < 0.03 | MIC 0.06 | MIC 0.5 | MIC > 64 | N%
|---------------|------------|----------|---------|---------|------
| Penicillin    | 100.0      | 0.00     | 0.00    | 0.00    | 95.5 |
| Vancomycin    | 100.0      | 0.00     | 0.00    | 0.00    | 100.0|
| Ceftriaxone   | 99.9       | 0.01     | 0.1     | 0.0     | 99.9 |
| Tigecycline   | 99.9       | 0.01     | 0.1     | 0.0     | 99.9 |
| Clindamycin   | 93.9       | 6.1      | 0.0     | 0.0     | 93.9 |
| Levoquin      | 99.9       | 0.01     | 0.1     | 0.0     | 99.9 |
| Vancomycin/cef | 100.0     | 0.00     | 0.00    | 0.00    | 100.0|
| Vancomycin/Levo | 100.0    | 0.00     | 0.00    | 0.00    | 100.0|

**Conclusions:** Linezolid was as active as vancomycin against all SPN isolates regardless of phenotype. Linezolid MIC₉₀ of 1 mcg/ml was 1-64 fold more active than comparators including azithromycin, levofloxacin and meropenem.

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**Introduction**

Linezolid is a synthetic antibiotic used for the treatment of serious infections caused by Gram-positive bacteria that are resistant to several other antibiotics. A member of the oxazolidinone class of drugs, linezolid is active against most Gram-positive bacteria that cause disease, including *Streptococcus pneumoniae*, vancomycin-resistant enterococci (VRE), and methicillin-resistant *Staphylococcus aureus* (MRSA). The main indications of linezolid are infections of the skin and soft tissues and pneumonia (particularly hospital-acquired pneumonia), although off-label use for a variety of other infections is becoming popular.

The current study investigated the activity of linezolid during 2004 through 2009 against *Streptococcus pneumoniae* (including various resistant phenotypes) as part of the Tigecycline Evaluation and Surveillance Trial (T.E.S.T.) and the consistent activity of the agent and very low resistance rates.

**Materials & Methods**

**Clinical isolates:** Isolates were identified to the species level and tested at each participating laboratory. All organisms were deemed clinically significant by local participant criteria. Isolate inclusion was independent of medical history, antimicrobial use, age, or gender. All sites identified each study isolate utilizing local participation criteria. All isolates were from the period 2004 - 2008 and originated from Africa, Asia, Europe, Latin America, Middle East, North America and the South Pacific.

**Susceptibility testing:** Minimum inhibitory concentrations (MICs) were determined using plates manufactured by Trek Diagnostics and MicroScan by Siemens, following manufacturer and Clinical and Laboratory Standards Institute (CLSI) instructions for broth microdilution testing (1). Susceptibility was determined using clinical breakpoints published by the CLSI (2).

**References**

2. CLSI, Performance Standards for Antimicrobial Susceptibility Testing; Twentieth Informational Supplement. CLSI document M100-S20. 2010: Clinical Laboratory Standards Institute; 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1998 USA.

**Conclusions**

- Linezolid was as active as vancomycin against all SPN isolates regardless of phenotype.
- Linezolid’s MIC₉₀ of 1 mcg/ml was 1 to >64 fold more active than comparators including azithromycin, levofloxacin and meropenem.

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