In Vitro Potency of Tigecycline Against Pathogens from Most Common Body Sites: A Study in Asia/Pacific Rim

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REVISED ABSTRACT

Objectives: Surveillance studies can identify patterns of resistance and assist in empirical antibiotic choice as resistance can vary by organism and to be isolation. The Tigecycline Evaluation Surveillance Trial (T.E.S.T.) is an ongoing global study that can serve to help recognize resistance by body site. This report evaluates differences in antibiotic susceptibility testing methods. 8,787 clinical isolates collected in Asia/Pacific Rim 2004-2007. Methods: 8,787 strains isolated from 8 species were cultured between 2004 and 2007 at 50 laboratories in 10 countries in Asia/Pacific region. MICs for each strain were determined per CLSI guidelines at each facility using broth microdilution. MICs were analyzed to identify any significant differences in antimicrobial susceptibility. Results: Tigecycline (Tig) MICs, values for 8 species were 2–12 dilutions of each other, with no single source giving a higher MIC of Tig. The same was seen for Tig MICs, which were almost always 1–2 dilutions of the MIC. Comparators drugs generally showed similar absolute values of variability in activity vs. isolates from various body sites; however, the MICs were usually much higher than those of Tig. Even more prevalent had such high ratios against the Acinetobacter, staphylococci and staphylococci. Comparison isolates identified from more than 8 body sites had generally similar antibiotics, with no single source showing significantly different activity patterns. TIG demonstrated a broad spectrum of activity and consistently low MIC values, including strains resistant to other drugs (MRSAs, ESBL producers, and Acinetobacter).

BACKGROUND

Tigecycline (formerly GAF-293), is a member of a new class of antibacterial agents, the glycylcyclines. This synthetic analogue of the tetracyclines exhibits significant antibacterial activity that is both bacteriostatic and, in certain instances, bactericidal activity against both bacterial strains and, in certain instances, bactericidal activity against bacterial strains having given genic encoding either of these or tetracycline resistance. Certain in vitro results suggest that the tetracycline molecule restore activity against bacteria harboring genes encoding either of these or tetracycline resistance. A similar characteristic, low MIC of tigecycline, that prevents the overgrowth of the two moieties distinct forms of resistance while maintaining activity against susceptible gram-positive, gram-negative, and anaerobic bacteria [3]. Furthermore, resistance to tigecycline is difficult to produce even in the laboratory. Previous studies have demonstrated excellent in vitro activity for tigecycline against clinical and laboratory strains of gram-positive and -negative bacteria with minimum inhibitory concentrations for the 90th percentile inhibited at or below 2 mcg/ml, including difficult-to-treat pathogens. Staphylococcus aureus, Enterococcus faecalis, vancomycin-resistant enterococci (VRE), and extended-spectrum beta-lactamase (ESBL) producing Enterobacteriaceae [4]. This study was undertaken to determine the in vitro activity of tigecycline against a large number of pathogens in various body sources collected from a large geographically diverse population over a four year period. This study is part of the ongoing global Tigecycline Evaluation and Surveillance Trials (T.E.S.T.) program.

METHODS

- All isolates were cultured from clinical respiratory tract, urine (more than 25% of all isolates), skin, wound, body fluids, and other defined sources. Only one isolate per patient was accepted into the study. More than 6.700 clinical isolates were collected and tested between 2004-2007 by 50 Investigative sites across Asia, Australia, China, Hong Kong, Indonesia, Korea, Pakistan, Philippines, Singapore, Taiwan, and Thailand, totalized to the species level and tested at each site by the participating laboratory.

- Organism collection, transport, confirmation of organism identification, as well as, development and management of a centralized database was coordinated by Laboratory International Medicine Studies (LIMS), a branch of International Health Management Associates, Inc. in Schuylkill, USA.

- All isolates were included from major body sources. Isolate inclusion was independent of medical history, antimicrobial use, age or gender, or any other criteria for isolating the laboratory.