Activity of Tigecycline Tested Against Vancomycin-resistant Enterococci, Including Clostridium-17 E. faecium Strains, Isolated in Europe

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ABSTRACT

Objectives: To evaluate the activity of tigecycline when tested against clinical strains of enterococci collected in European medical centers, including E. faecium strains characterized as being clonal complex (CC)-17. CC-17 characterizes a lineage of Enterococcus spp. that has been a leading factor for selection of these resistant Enterococci phenotypes. Clonal dissemination and contamination of environmental gene pools such as possibly animal healthcare facilities in Europe may have also contributed to the spread of VRE. VRE infections occur most commonly among immunocompromised patients, hospitalized patients with multiple co-morbidities and those in ICUs, nursing homes or being treated with multiple antimicrobial agents. High morbidity and mortality has been associated with VRE infections due to limited therapeutic options and activity of last-resort therapies.

Methods: Enterococcal strains were submitted from 34 medical centers located in Europe (13 countries) and Israel during 2000-2007. Strains were susceptibility (S) tested against tigecycline and >20 antimicrobials using CLSI broth microdilution methods and USA-FDA/EUCAST interpretative criteria (tigecycline S at ≤0.25 mg/L).

RESULTS

Nearly 4,600 isolates of Enterococcus spp. were collected from European medical centers for antimicrobial susceptibility testing during 2000 to 2007. Included among these were strains of E. faecalis (3,070 strains), 95% vancomycin non-susceptible and E. faecium (1,337 strains, 298 vancomycin non-susceptible). These strains were collected from 34 medical centers in Europe and Israel to a central laboratory for identification confirmation and susceptibility testing. Isolates were tested for susceptibility to antimicrobial agents including tigecycline and nine comparator agents using the CLSI broth microdilution method (M7-A7, 2006). Mueller-Hinton broth was used to inoculate commercial 96-well plates (TREK Diagnostics, Cleveland, OH, USA). Susceptibility determinations were determined using the CLSI (M100-S23) and EUCAST clinical breakpoint criteria. Isolates of vancomycin-resistant strain (VRE) E. faecium were characterized as CC-17 if they were also resistant to ampicillin and chloramphenicol. This included a collection of 162 strains. These were the isolates used to determine the rate of VRE between 2000 and 2007 which were collected from infection sources that were monitored each year. These included BSI, respiratory tract infections and skin and soft tissue infections.

CONCLUSIONS

Isolation of vancomycin-resistant Enterococcus spp. from human infections has significantly increased in European countries over the past four years and quinupristin/dalfopristin is now an important problem among E. faecium isolates in many of the monitored countries. Epidemic MDR-E. faecium isolates were detected across nearly all countries in Europe and many of these isolates were phenotypically consistent with CC-17. Tigecycline has potent activity against these problematic MDR and CC-17-like isolates of E. faecium.

Along with traditional or newer agents such as linezolid, tigecycline has emerged as a valuable treatment modality for Enterococcus spp. including MDR-E. faecium.