In vitro evaluation of delafloxacin activity when tested against contemporary European community-acquired bacterial respiratory tract infection isolates (2014-2017): Results from the SENTRY Antimicrobial Surveillance Program

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Background: Delafloxacin (DLX) is a broad-spectrum fluoroquinolone (FQ) antibacterial that has completed clinical development (oral and intravenous formulations) and was approved by the US Food and Drug Administration in 2017 for treating acute bacterial skin and skin structure infections (ABSSSI). Additionally, DLX is in treatment trials for community-acquired bacterial pneumonia. In this study, in vitro susceptibility results for DLX and comparator agents were determined for clinical isolates from community-acquired respiratory tract infections (CA-RTI) collected from 36 medical centres in Europe participating in the SENTRY Surveillance Program during 2014–2017.

Materials/methods: A total of 1,840 isolates that included 973 Streptococcus pneumoniae (SPN), 502 Haemophilus influenzae (HI), and 348 Moraxella catarrhalis (MC) were collected during 2014–2017 and included only 1 isolate/patient/infection episode. Isolate identifications were confirmed at JMI Laboratories. Susceptibility testing was performed according to CLSI reference broth microdilution methodology, and results were interpreted per CLSI and EUCAST (2017) interpretive criteria. Other antimicrobials tested included levofloxacin (LVX), moxifloxacin (MOX), and penicillin (PEN). Beta-lactamase production for HI and MC was determined by the nitrocephin disk test.

Results: DLX demonstrated potent in vitro activity against SPN (MIC50/90 0.015/0.03 mg/L) and was more active than LVX (MIC50/90 1/2 mg/L) or MOX (MIC50/90 ≤0.12/0.25 mg/L). Activity for DLX remained the same for 163 PEN-intermediate or 105 PEN-resistant isolates. For 17 LVX-nonsusceptible SPN (LVX MIC >2 mg/L), the DLX MIC50/90 values were 0.06/1 mg/L with all isolates having DLX MICs ≤1 mg/L. For HI, DLX was extremely potent with MIC50/90 values of ≤0.001/0.002 mg/L, LVX MIC50/90 were ≤0.015/0.03 mg/L, and MOX MIC50/90 were 0.03/0.03 mg/L. For MC, the MIC50/90 were 0.004/0.008 mg/L for DLX and the MIC50/90 values were 0.03/0.06 mg/L and 0.06/0.06 mg/L for LVX and MOX, respectively. FQ activity for HI or MC was unaffected by any beta-lactamase being present.

Conclusions: Delafloxacin demonstrated extremely potent in vitro antibacterial activity against CA-RTI pathogens, including SPN, HI, and MC and was the most potent FQ tested. These data support the continued study of DLX as a potential treatment for community-acquired pneumonia.