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P2783 Correlation between broth microdilution and disk diffusion methods results when testing ceftaroline against methicillin-resistant *Staphylococcus aureus* using the 5 microgram ceftaroline disk

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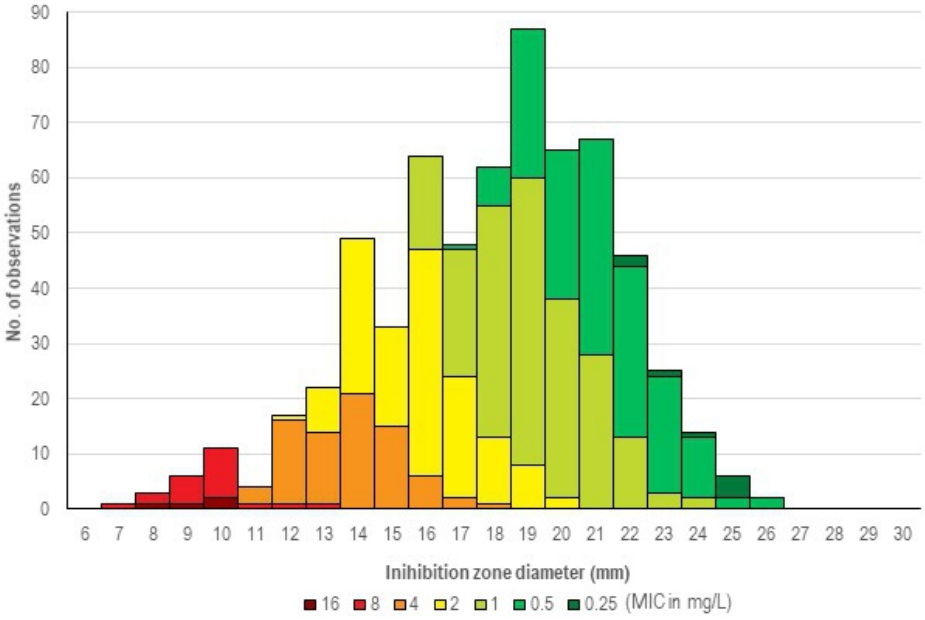
Background: Discrepancy rates between MIC and disk zones vary according to the percentage of isolates with MIC values within +/-1 doubling dilution of the breakpoints. Although the prevalence of methicillin-resistant *S. aureus* (MRSA) isolates that are ceftaroline-nonsusceptible (MIC ≥2 mg/L) is generally low, it may vary substantially by geographic region. We evaluated the disk-MIC correlation when testing ceftaroline against a challenge collection of MRSA.

Materials/methods: We evaluated 158 MRSA isolates, including 106 randomly selected isolates and 52 isolates with decreased susceptibility to ceftaroline (MIC, 1–16 mg/L). Isolates were tested by CLSI broth microdilution method, and disk diffusion (DD) was performed with 5-µg disks and Mueller-Hinton agar from 2 manufacturers each; thus, there were 4 DD results for each MIC result. EUCAST breakpoints were applied. Optimal DD breakpoints were determined by the error-rate bounded method. Selected isolates (n=51) were characterized by whole genome sequencing.

Results: When applying 2018 (v8.1) EUCAST MIC breakpoints for indications other than pneumonia (≤1/>2 mg/L for susceptible/resistant), the DD breakpoints that provided the lowest error rates were ≥17/<14 mm (susceptible/resistant), with very major (VM; false susceptible) errors of 0.0% for ≥I+2 and 0.7% for I±1 (overall VM error rate of 0.5%), no major (false-resistance), and minor error rates of 0.0% for ≥I+2, 25.9% for I±1, and 0.0% for ≤I-2 (17.7% overall). Errors rates for the 2018 EUCAST DD breakpoints of ≥20/<17 mm (susceptible/resistant) were no VM errors, major error rates of 0.0% for ≥I+2, and 3.9% for I±1 (2.7% overall), and minor error rates of 0.0% for ≥I+2, 50.5% for I±1, and 19.9% for ≤I-2 (40.0% overall). No mutation in the SCC*mec* was observed in 5 of 15 isolates with ceftaroline MIC results of 2 mg/L, whereas 3 of 11 isolates with ceftaroline MIC results of 1 mg/L exhibited mutations in the penicillin-binding domain (PBD; 1 isolate) or in the non-PBD (2 isolates).

Conclusions: Elevated discrepancy rates were observed between DD and BMD, with a clear tendency of isolates that were intermediate by BMD being categorized as resistant by DD. DD breakpoints should be moved 3 mm downward to provide the lowest inter-method error rates.


No. of observations
90
80
70
60
50
40
30
20
10
0
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Inihibition zone diameter (mm)
16 8 4 2 1 0.5 0.25 (MIC in mg/L)