Antimicrobial Activity of Dalbavancin and Comparators against Staphylococcus aureus causing Pneumonia in Patients with and without Cystic Fibrosis

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INTRODUCTION
Staphylococcal aureus is the most commonly isolated organism in cystic fibrosis (CF) patients with respiratory tract infections as well as the primary cause of recurrent acute pulmonary infection and progressive decline in lung function.

Antimicrobial treatment is recommended for CF patients with symptoms and in those with persistent detection of S. aureus, but the best antibiotic approach has not been established yet.

Dalbavancin is a lipoglycopeptide with a very long half-life that allows the treatment of serious infections with once weekly or biweekly administration.

We evaluated the activity of dalbavancin and comparator agents against S. aureus isolated from the lower respiratory tract of CF and non-CF patients with pneumonia.

MATERIALS AND METHODS
A total of 357 S. aureus isolates were collected from CF patients (1 patient) in 36 medical centers in 2018-2019.

Antimicrobial susceptibility results from these 357 CF isolates were compared to isolates collected from non-CF patients with pneumonia from the same medical centers during the same period.

Only bacterial isolates determined to be significant by local criteria as the reported probable cause of pneumonia were included in the investigation.

CF isolates were mainly from North America (n=193; 54.1%) and Europe (n=141; 39.5%).

Susceptibility testing was performed by reference broth microdilution methods at a central laboratory (JMI Laboratories, North Liberty, Iowa).

Antimicrobial agents tested include dalbavancin (DALBA), ceftaroline (CPT), oxacillin (OXA), clindamycin (CLI), levofloxacin (LEV), tetracycline (TET), trimethoprim-sulfamethoxazole (TMP-SMX), daptomycin, linezolid, and vancomycin.

RESULTS
Dalbavancin exhibited potent activity (MIC50/90, 0.03/0.03 mg/L) and complete coverage (100% susceptibility) against isolates from CF and non-CF patients (Figures 1 and 2).

Susceptibility profiles were very similar among S. aureus isolates from CF and non-CF patients (Figure 2).

Clindamycin (MIC50, 0.25 mg/L) was active against 97.8% and 98.1% of isolates from CF and non-CF patients, respectively (Figure 2).

Oxacillin resistance (MRSA) rates were 27.7% among CF and 28.7% among non-CF patients (Figure 2).

All isolates from CF and non-CF patients were susceptible to daptomycin (MIC50, 0.06/0.25 mg/L; linezolid (MIC50, 12 mg/L) and vancomycin (MIC50, 0.5/1 mg/L; data not shown).

Among MRISA isolates from CF/non-CF patients (n=99/208), susceptibility to ceftaroline, clindamycin, levofloxacin, and tetracycline was 97.5%/99%, 58.8%/84.4%, 40.4%/29.3%, and 83.8%/89.4%, respectively (Figure 3).

Dalbavancin may represent a valuable option to treat CF patients with S. aureus pneumonia.

CONCLUSIONS
Dalbavancin demonstrated high potency (low MIC values) and broad spectrum against S. aureus from CF and non-CF patients.

S. aureus causing pneumonia in CF patients exhibited an antimicrobial resistance profile very similar to those S. aureus isolates from non-CF patients with pneumonia.

Dalbavancin may represent a valuable option to treat CF patients with S. aureus pneumonia.

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REFERENCES

Figure 1. Antimicrobial activity (MIC distributions) of dalbavancin tested against S. aureus isolates from CF and non-CF patients collected worldwide (2018–2019)

Figure 2. Antimicrobial susceptibility of S. aureus isolates collected from CF and non-CF patients in medical centers located worldwide (2018–2019)

Figure 3. Antimicrobial susceptibility of MRSA isolates collected from CF and non-CF patients in medical centers located worldwide (2018–2019)