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Penicillinase Production and In Vitro Susceptibilities of *Staphylococcus lugdunensis*

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Of 59 clinical isolates of *Staphylococcus lugdunensis*, 76% were β-lactamase negative, with penicillin G MICs of ≤0.13 μg/ml, and 24% were β-lactamase positive, with penicillin MICs of ≥0.5 μg/ml. Bimodal distributions were observed also with ampicillin, ampicillin-sulbactam, and amoxicillin-clavulanate. All strains were susceptible to oxacillin, cephalothin, gentamicin, rifampin, and vancomycin; 98% were erythromycin susceptible.

Staphylococcus lugdunensis is a recently described species characterized by production of fibrinogen affinity factor and ornithine decarboxylase. Freney et al. (3) reported 11 strains from human clinical specimens. Subsequently, the clinical syndromes for 45 isolates (representing 13 patients) were described (2). These syndromes included infective endocarditis, septicemia, deep tissue infection, vascular prosthesis infection, osteomyelitis, and skin infection (2). Lambe et al. compared the pathogenicities of 20 strains of *S. lugdunensis* with those of three other staphylococcal species in an animal model. After intraperitoneal challenge with *S. lugdunensis*, there was 60% abscess formation, and 100% of the cultures remained positive (D. W. Lambe, K. P. Ferguson, C. G. Gemmell, and J. L. Keplinger, Program Abstr. 28th Intersci. Conf. Antimicrob. Agents Chemother., abstr. no. 1398, 1988). This study examines the in vitro susceptibilities and penicillinase production of 59 clinical isolates of *S. lugdunensis*.

Fifty-two isolates were from patients evaluated at The Ohio State University Hospitals. Clinically significant staphylococcal isolates (cultures of specimens from normally sterile sites or specimens with a direct smear showing purulence) were characterized by colony morphology and hemolytic characteristics on Trypticase soy agar with 5% sheep blood agar at 35°C, catalase production, latex slide agglutination for clumping factor and protein A (Accu-Staph; Carr-Scarborough Microbiologicals, Inc., Decatur, Ga.), tube coagulase (pig plasma), and 24 biochemical tests. Seven clinical isolates, one of which is now designated as the ATCC reference strain 43809, were kindly provided by J. Freney (the Centre National des Staphylocoques, Lyons, France).

β-Lactamase production was detected with an acidimetric test (Betatest; Medical Wire and Equipment Co., Cleveland, Ohio) and the nitrocefin test (Cefinase; BBL Microbiology Systems, Cockeysville, Md.). The results of both β-lactamase tests for the 59 isolates were identical. β-Lactamase production was observed in 14 of 59 isolates (24%).

MICs were determined by the National Committee for Clinical Laboratory Standards microdilution method (4). MICs for β-lactamase-positive and β-lactamase-negative strains are shown in Fig. 1. β-Lactamase production defined a bimodal distribution for penicillin G. The MIC of penicillin G for β-lactamase-negative strains of *S. lugdunensis* was ≤0.13 μg/ml, whereas that for β-lactamase-negative strains of *S. aureus* was ≤0.06 μg/ml (1). Ampicillin, amoxicillin-clavulanate, and ampicillin-sulbactam MICs were higher for β-lactamase-positive strains than for β-lactamase-negative strains. The bimodal distribution for the latter two suggests incomplete inhibition of the β-lactamase by clavulanate and sulbactam. No oxacillin-resistant strains were observed.

Susceptibility to oxacillin was also determined by the National Committee for Clinical Laboratory Standards disk diffusion method (5). Zones of inhibition for oxacillin ranged from 15.4 to 26.9 mm (mean ± standard deviation = 19.2 ± 2.3). The zones of inhibition for oxacillin correlate with the National Committee for Clinical Laboratory Standards criteria for susceptibility of staphylococci (5).

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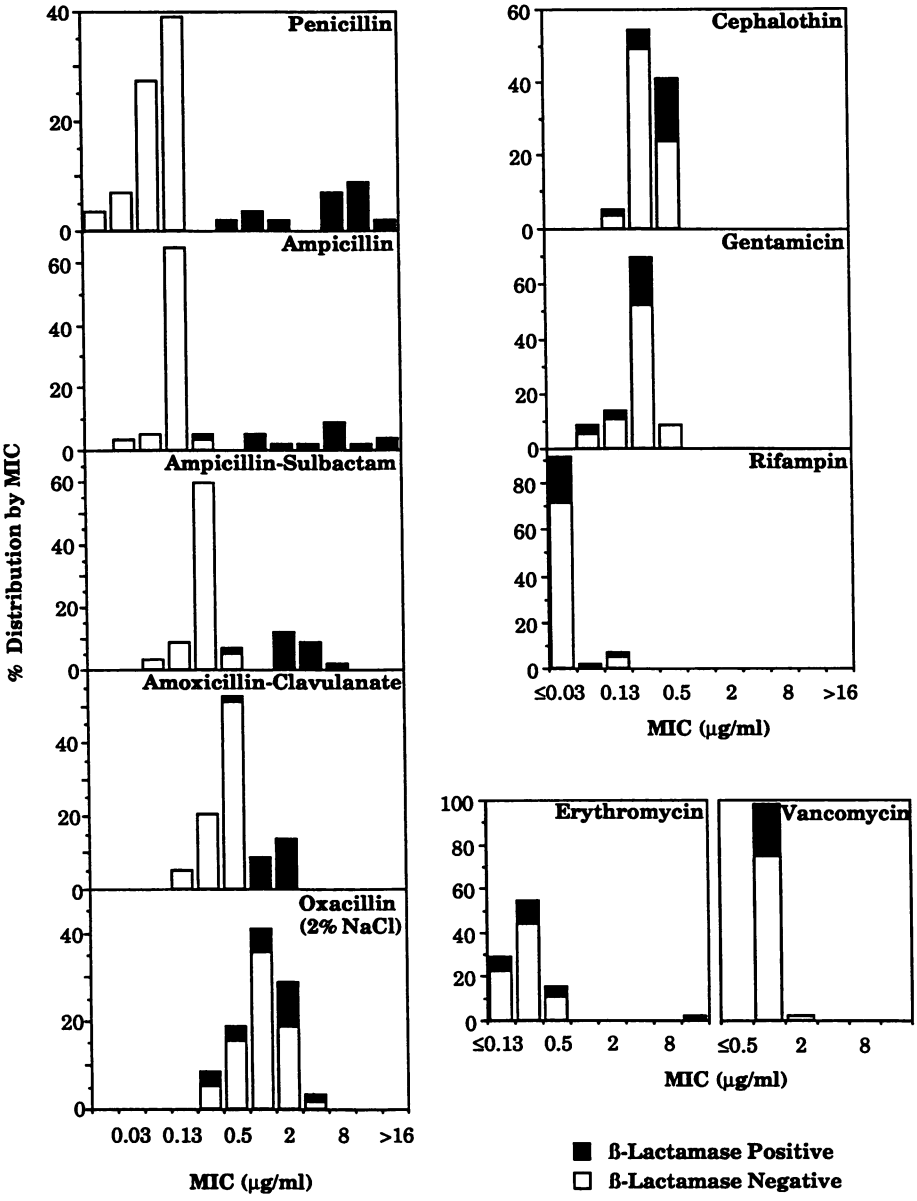

FIG. 1. MICs for *S. lugdunensis* relative to production of β-lactamase.