Susceptibility of Contemporary *Propionibacterium acnes* to Fusidic Acid

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Background. Although *Staphylococcus aureus* and coagulase-negative staphylococci are the most common organisms isolated from bone and joint infections, other bacteria are occasionally found in these infections. Among bacteria found on the skin, *Propionibacterium* spp., although sometimes contaminants, are also known to cause bone and joint infections. *Propionibacterium acnes* is reported in approximately 10% of Prosthetic Joint Infections, but its frequency is likely underestimated due to the short incubation times of primary cultures in many clinical laboratories and its growth being considered as contamination. While fusidic acid is known to be active against staphylococci and has been reported to be active against *P. acnes*, this study was conducted to determine the susceptibility of contemporary *P. acnes* strains isolated from wounds and bone and joint infections. The determination of susceptibility was especially important because of the topical use of fusidic acid and the potential for fusidic acid to select for resistance.

Methods. MICs of fusidic acid and comparator drugs were determined for 51 clinical isolates of *P. acnes* cultured from normally sterile body sites (e.g., bone, blood, joints) of patients at the University of Rochester Medical Center, Rochester, NY, in calendar years 2011 and 2012. MICs were determined by broth microdilution in Brucella broth supplemented with hemin (5 µg/ml), vitamin K1 (1 µg/ml) and lysed horse blood (5%) with anaerobic incubation at 37° C for 48 h as recommended by CLSI M11-A7.

Results. The range of MICs and MIC_{90}s for fusidic acid and comparator drugs were determined. Fusidic acid MIC range was 0.03-1 µg/mL with an MIC_{90} of 1 µg/ml. Among other antibiotics used for bone and joint infections, vancomycin had an MIC range of 0.12-1 µg/ml and the MIC_{90} was 1 µg/ml, while daptomycin was less active with an MIC range of 0.5-8 µg/ml and an MIC_{90} of 4 µg/ml. Among oral antibiotics, linezolid had an MIC range of $\leq$0.03-0.5 and an MIC_{90} of 0.5 µg/ml. Levofloxacin had an MIC range of 0.06-2 µg/ml and an MIC_{90} of 1 µg/ml.

Conclusion. In conclusion, fusidic acid had potent activity against *P. acnes*. The MIC of fusidic acid for all strains was $\leq$1 µg/ml. Fusidic acid could provide coverage in bone and joint infections for gram positive bacteria other than staphylococci, such as *P. acnes*.

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