BACTERICIDAL ACTIVITY OF LEVOFLOXACIN ALONE AND IN COMBINATION WITH CLINDAMYCIN OR N-ACETYLCYSTEINE AGAINST BIOFILM PSEUDOMONAS AERUGINOSA AND STAPHYLOCOCCUS AUREUS

BY

S.M. Ansari¹ and M.A.M. Yassien²

FROM

Faculty of Medicine¹, Faculty of Pharmacy², King Abdul Aziz Universaity, Jeddah, Saudi Arabia

ABSTRACT

Bactericidal activity of levofloxacin alone and in combination with clindamycin (20 µg/ml) or N-acetylcysteine (1 mg/ml) was studied against clinical isolates of Pseudomonas aeruginosa and Staphylococcus aureus (10 isolates each) in suspensions and in biofilms (formed by overnight incubation of 10⁵-10⁶ CFU/ml in the wells of microtiter plates). Viable counts of all the sets were done on Mueller-Hinton agar plates at 0, 2, 4, 6, 12, 24 hr periods. The presence of levofloxacin at concentration equivalent to MBC and 2MBC (2-8 times MIC) reduced the counts (log CFU/ml) of P. aeruginosa, grown in suspension, from 6.7-8.2 at 0 hr to 3.6-4.4 and 1.7-2.8 at 24 hr, respectively, and of S. aureus grown in suspension, from 6.8-8.2 at 0 hr to 3.6-4.7 and 3.1-4.1 at 24 hr, respectively (control = 8.0-8.7). The presence of clindamycin or N-acetylcysteine did not significantly increase the bactericidal activity of levofloxacin against P. aeruginosa isolates in suspension. When these isolates were grown as a biofilm, the bactericidal activity of levofloxacin at concentration of 1 MBC was significantly reduced (P < 0.01) as compared to that obtained against the tested organism in suspension, while at concentration of 2 MBC no significant change in the activity was observed (P < 0.01). In the presence of clindamycin or N-acetylcysteine, the activity of levofloxacin against the biofilm P. aeruginosa was significantly increased (P < 0.01). In case of S. aureus the presence of N-acetylcysteine did not significantly increased the bactericidal activity of levofloxacin against the organism in suspension form, but significantly increased against biofilm associated bacteria. These data suggest that the presence of clindamycin and N-acetylcysteine enhanced the bactericidal activity of levofloxacin against biofilm associated P. aeruginosa and S. aureus.