OUTER MEMBRANE PROTEINS AND VIRULENCE FACTORS OF PSEUDOMONAS AERUGINOSA AND ESCHERICHIA COLI AFTER POSTANTIBIOTIC EFFECTS INDUCED BY DIFFERENT ANTIMICROBIAL AGENTS

BY

M.A. Yassien

FROM

Faculty of Pharmacy, King Abdul Aziz University, Jeddah, Saudi Arabia

ABSTRACT

The postantibiotic effects (PAEs) were induced in Pseudomonas aeruginosa and Escherichia coli clinical isolates after short time (30 min) treatment with 2X- and 4X-MICs of fluoroquinolones (levofloxacin and ciprofloxacin), gentamicin, and β-Lactam antibiotics (cefoxoperazone, and cefotaxime). The PAEs of fluoroquinolones and gentamicin (at 2X- and 4X-MICs) on P. aeruginosa and E coli isolates were in the ranges of 1.0-4.2h and 1.2-4.6h, respectively. In addition, these PAEs induced reduction of elastase activity to the range of 23-54% and 44-63%, and of protease activity to the range of 48-78% and 68-84% in P. aeruginosa, respectively. Concerning E coli, PAEs of these agents reduced the hemolysin activity to the range of 54-83% and 78-88%, respectively. The PAEs of fluoroquinolones on the bacterial regrowth and virulence factor activity were more than that of the gentamicin, and the highest PAE was observed with levofloxacin. The PAEs of β-Lactam antibiotics induced weak effect (ranged between 0.3 and 0.9h) on the regrowth of the tested isolates, in addition, no significant (P≤ 0.05) change in their virulence factors activity was observed. The PAEs of only 4X-MIC fluoroquinolones caused alteration in the outer membrane proteins (OMP) of P. aeruginosa (reduction in the expression of 41 and 42 KDa and overexpression of 38 and 51KDa) and of E coli (reduction in 36 and 38 KDa). According to the obtained results, the PAEs of fluoroquinolones and gentamicin induced significant suppression in the P. aeruginosa elastase and protease activity, and E coli hemolysin activity. In addition, the PAEs of high concentration (4X-MICs) of fluoroquinolones caused alteration in the OMP of P. aeruginosa and E. coli.