In vitro effect of subminimal inhibitory concentrations of antibiotics on the biofilm formation ability of Acinetobacter baumannii clinical isolates.

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Abstract

The ability of Acinetobacter baumannii strains to form biofilm is one of the most important virulence factor which enables bacterial survival in a harsh environment and decreases antibiotic concentration as well. Subminimal inhibitory concentrations (subMICs) of antibiotics may change bacterial ultrastructure or have an influence on some different molecular mechanisms resulting in morphological or physiological changes in bacteria itself. The aim of this study was to determine effects of 1/2, 1/4, 1/8 and 1/16 minimal inhibitory concentration of imipenem, ampicillin-sulbactam, azithromycin, rifampicin and colistin on biofilm formation ability of 22 biofilm non-producing and 46 biofilm producing A. baumannii strains (30 weak producing strains and 16 moderate producing strains). Results of this study indicate that 1/2-1/16 MICs of imipenem, azithromycin, and rifampicin can reduce bacterial biofilm formation ability in moderate producing strains (p < 0.05), whereas 1/16 MIC of imipenem and 1/4-1/8 MICs of rifampicin reduce the biofilm formation in weak producing strains (p < 0.05). Statistically significant effect was detected among biofilm non-producing strains after their exposure to 1/16 MIC of azithromycin (p = 0.039). SubMICs of ampicillin-sulbactam and colistin did not have any significant effect on biofilm formation among tested A. baumannii strains.

KEYWORDS: Acinetobacter baumannii; antibiotic; biofilm; subminimal inhibitory concentration; virulence factors

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