عنوان مقاله:

INHIBITORY POTENCY OF HUMAN ANTIMICROBIAL PEPTIDE DCD-1L ON THE BIOFILM FORMATION OF ACINETOBACTER BAUMANNII

محل انتشار:

نوزدهمین کنگره بین المللی میکروب شناسی ایران (سال: 1397)

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نویسندگان:

Zahra Farshadzadeh - *Department of Microbiology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

Behrouz Taheri - *Department of Medical Laboratory Sciences, School of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

Abbas Bahador - *Department of Microbiology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran*

خلاصه مقاله:

Background and Aim:The high ability to develop biofilm as a critical factor in chronic infections along with high rate of drug-resistant Acinetobacter baumannii highlights the need to identify novel antibiotics. The aim of this study was to assess in vitro and in vivo anti-biofilm activities of dermcidin-1L (DCD-1L) against clinical A. baumannii strains.Methods: In vitro antibacterial, anti-adhesive, and anti-biofilm activities of DCD-1L to clinical and standard (ATCC 19606) A. baumannii strains were investigated. Furthermore, effect of DCD-1L treatment on expression of several biofilm-associated genes including abaI, ompA, bfmRS, csuE, pgaAB, and wspR was evaluated using RT-qPCR. In addition to in vitro study, the catheter infection model was used to assess anti-biofilm activity of DCD-1L against standard A. baumannii strain.Results:Minimum inhibitory concentration (MIC) of DCD-1L was 16 µg/ml. DCD-1L also inhibited biofilm formation at sub-inhibitory concentration (1/4MIC), whereas the high value of MBEC (1024 µg/ml) indicates disability of DCD-1L to eradicate existing biofilm. Using RT-qPCR, we were able to demonstrate that DCD-1L affected biofilm formation by decreasing the attachment of bacterial cells and influencing quorum sensing system, leading to the down-regulation of genes involved in biofilm development. Furthermore, in mouse catheter infection model following treatment with DCD-1L at 1/2 MIC and 1 MIC, the biofilm was significantly reduced as compared to the untreated control.Conclusion:In the present study a new, previously unreported function for the human anionic antimicrobial peptide DCD-1L was described, suggesting that DCD-1L could play a critical role in human innate immune system through its anti-adhesive, and anti-biofilm activities.

کلمات کلیدی:

Acinetobacter baumannii, Antimicrobial peptide, Dermcidin-1L