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خلاصه مقاله:

Background: Pseudomonas aeruginosa biofilm is one of the problems in antibiotic treatment of infections. Nanomedicines, such as chitosan (CS) can carry multiple drugs and improve the therapeutic effects of antibiotics. Objectives: This study aimed at the synthesis and characterization of ciprofloxacin-loaded chitosan nanoparticles for eradication of P. aeroginosa biofilm. Methods: Cipro-CS microparticles were prepared by ionic gelation method and their size, zeta potential, and drug release pattern were determined. MBEC and MBIC of different groups of antibiotics (ciprofloxacin, ciprofloxacin-PAβN, CS ciprofloxacin, and CS ciprofloxacin-PAβN) were performed on biofilm samples of P. aeroginosa. Results: Ciprofloxacin loading efficiency was ۳۵.۵۱%, and encapsulation efficiency was ۵۵.۰۶%. Released ciprofloxacin from CS nanoparticles was ۸۰% after ۲۴ hours. Biofilm production was positive in ۹۶.۷% of the isolates while ۳۰.۱% of the samples had strong biofilm. The best result for MBIC was CS ciprofloxacin, CS ciprofloxacin-PAβN, ciprofloxacin- PAβN, and ciprofloxacin, respectively. For MBEC the result was slightly different and from the best to better CS Ciprofloxacin-PAβN, CS Ciprofloxacin, Ciprofloxacin-PAβN, and ciprofloxacin. Conclusion: Today, with increasing antibiotic resistance, there are many challenges in treating infections. Due to the role of biofilm in antibiotic resistance, researchers are looking for new antibiotics to treat infections.

کلمات کلیدی:

Chitosan, Nanoparticle, Biofilm, Pseudomonas aeruginosa

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