عنوان مقاله:

Antimicrobial action of mesoporous silica nanoparticles loaded with cefepime and meropenem separately against multidrug-resistant (MDR) Acinetobacter baumannii

محل انتشار:

بیستمین کنگره بین المللی میکروب شناسی ایران (سال: 1398)

تعداد صفحات اصل مقاله: 1

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خلاصه مقاله:

Introduction and Objectives: The overuse of antibiotics is causing a continuous emergence of drug resistance in pathogenic bacteria. The multidrug resistance (MDR) by reason of extensive use of antibiotics is being a major challenge in world public health. A. baumannii is becoming an increasingly important human pathogen due to the emergence of MDR strains. The aim of this study was to prepare positive charge mesoporous silica nanoparticles (MSN) which are loaded by cefepime (CFP) and meropenem (MEM) to improve efficacy and antibacterial activity to combact MDR strains. Materials and Methods: An amine functionalized MSN (MSN-NH2) was synthesized and loaded by CFP and MEM. The characterization of prepared nanoparticles was done by some methods such as Scanning Electron Microscopy (SEM), nitrogen adsorption/desorption isotherms, Fourier Transform Infrared (FT-IR) spectroscopy and X-ray Diffraction (XRD) spectroscopy. Broth microdilution and well diffusion methods were used to determine antibacterial activity against MDR A. baumannii. Results: The results showed the CFP and MEP loaded MSNs-NH2 (CFP@MSNs-NH2 and MEM@MSNs-NH2) were prepared correctly having high pay load and drug release kinetics is pH-sensitive. The antimicrobial tests results against multi drug resistant A. baumannii isolate were showed that drug loaded MSNs-NH2 more effective than free drug. Conclusions: The results of present study demonstrated that CFP@MSNs-NH2 and MEM@MSNs-NH2 potentiate antimicrobial activity than free drug and enhanced the possibility of combat against A. baumannii isolate.

کلمات کلیدی:

Antibiotic resistance, Acinetobacter baumannii, mesoporous silica nanoparticles, Cefepime, Meropenem