

عنوان مقاله:

Enhanced antibacterial activity in skin exudates isolated MDR Staphylococcus aureus by γ -Al₂O₃ nanoparticles

محل انتشار:

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تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Objective(s): Staphylococcus aureus is one of the most common causes of infections affecting the skin and soft tissues, which causes many types of syndromes, including skin and soft tissue infections in humans. The quick occurrence of resistance to many antimicrobial substances and severe infections requires long-term intravenous administration of beta-lactamase-resistant Penicillin. **Materials and Methods:** The antimicrobial activity of γ -Al₂O₃ nanoparticles (NPs) against 20 clinical samples of S. aureus isolated from skin exudates compared with the standard ATCC 25923 strain investigated alone and in synergy with an antibiotic showed resistance. The most resistant isolates were selected based on being positive for MepA and Kirby and Bauer disc diffusion method. Minimum inhibitory concentration (MIC) of γ -Al₂O₃ NPs against S. aureus was determined within 0-360 min treatment time. Then, the double-disc synergy test (DDST) method was performed for semi-sensitive and antibiotic-resistant strains to evaluate the probable inhibitory effect in synergy form. **Results:** The selected isolate expressed the MepA gene, showed the highest susceptibility reaction against γ -Al₂O₃ NPs in Z=78.125 ml/ μ g-1 and Z=156.25 ml/ μ g-1, and the process continued by performing the best ratio of NPs on semi-sensitive and also resistance antibiotic in synergy with NPs for the bacteria strains. The synergy of γ -Al₂O₃ NPs and Tetracycline, Oxacillin, and Ceftazidime showed higher sensitivity compared to using antibiotics alone. **Conclusion:** The results of this study demonstrate that γ -Al₂O₃ has a strong antimicrobial effect and can enhance the properties and characteristics of antibacterial potency in synergy or developed synthetic functionalized NPs with antibiotics.

کلمات کلیدی:

MepA gene, Staphylococcus aureus, Skin exudates, γ -Al₂O₃ nanoparticles

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