

عنوان مقاله:

In vitro evaluation of nickel oxide-based nanocomposite as wound dressing material against the bacterium isolated from burns

محل انتشار:

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خلاصه مقاله:

The introduction of newly devised wound dressing has been a major breakthrough in the management of wounds or infections. The aims of this paper are to isolate and identify bacterial species causing burn wound infections from a University-related Iranian hospital as well as determination of the antimicrobial susceptibility of the isolated microorganisms to newly devised nanocomposite materials for developing efficient wound dressing. The NiO nanoparticles were generated in situ and subsequently impregnated on the surface of cotton fabrics using ultrasound irradiation. Then, surface modification was performed to reduce initial bacterial attachment using polyethylene glycol. Cotton fabric was characterized by measuring scanning electron microscope (SEM), X-ray diffraction (XRD) and antibacterial properties. Disk diffusion method was used to quantify the efficacy of NiO-based wound dressing against the most common burn wound pathogen, *Pseudomonas aeruginosa*, isolated from burns and wound swabs patients of Emam Burn and Accidents hospital in Isfahan province, Iran. All isolates showed high resistance to the commonly used antibiotic (Ampicillin, Gentamicin, Cephalexin, Co-trimoxazole and Amoxicillin). In vitro evaluation showed that the modified cottons exhibited excellent biocidal action against high-resistant isolated Gram-negative bacteria compared to unmodified ones. The results suggested that NiO nanoparticles may be considered as an effective component of therapy for burn infections and in the combination with different antibacterial agents to overcome the resistance of the microorganisms and to obtain synergic antibacterial activity.

کلمات کلیدی:

nanocomposite, Bacteriocid, Burn infection, Wound Dressing

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