

Formulation and in Vitro Characterization of Bioactives Loaded Polymeric Nanoparticle Incorporated into Multiphase Hydrogel System for the Treatment of Infected Burn Wound

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Abstract : Despite significant advances in the treatment of severe burn injury, infection and sepsis persist as frequent causes of morbidity and mortality for burn victims due to extensive compromise of the skin and contiguous tissue that serve as a protective barrier against microbial invasion. In the setting of a burn wound infection, *Staphylococcus aureus* is the most commonly isolated pathogens from bloodstream infections in burn care hospitals. We aimed to develop a biocompatible system of Poly vinyl alcohol (PVA)-sodium alginate hydrogel carrying multiple drugs- catalase and mupirocin in controlled manner for effective and complete burn wound healing. PLGA nanoparticles of Catalase and mupirocin were prepared by homogenization method and optimized system was incorporated in PVA-sodium alginate slurry. PVA-sodium alginate hydrogels were prepared by freeze thaw method. The prepared dispersion was casted into films to prepare multiphase hydrogel system and characterized by in vitro and in vivo studies. The study clearly showed the beneficial effect of antioxidant enzyme and antibiotic in the treatment of infected burn wound, as evidenced by the reduced incidence of wound infection and the shortening of healing time.

Keywords : burn wound, catalase, mupirocin, wound healing

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