

FABRICATION AND CHARACTERIZATION OF CENTRIFUGAL SPUN CIPROFLOXACIN-LOADED MICROFIBER DRESSING FOR THE TREATMENT OF DIABETIC FOOT ULCERS

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ABSTRACT

Diabetic Foot Ulcers (DFUs) are open ulcers or sores on the foot with a bony prominence. They are a frequent manifestation of uncontrolled diabetes mellitus and often increase the risk of infection. DFUs typically take longer to heal, sometimes resulting in severe complications such as amputation. Our study aimed to develop a drug delivery system that could help to manage DFUs. We developed polymer-based fibers that were loaded with ciprofloxacin HCl via centrifugal spinning setup. The optimized polymeric fiber batch demonstrated over 90% drug entrapment, controlled drug release for 72 h, an average fiber diameter of 4.88 μm and porosity above 70%. The drug-loaded fibers showed antibacterial action against gram-negative (*E. coli*) and gram-positive (*S. aureus*) pathogens that are often prevalent in DFUs. Additionally, the fibers showed excellent hemocompatibility. Our study's findings show great potential in managing DFUs, and future studies will explore the potential application of this drug delivery system in treating and managing diabetic foot ulcers.