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A study of effect of cephalosporin drug loaded topical nanogel formulation on the bacterial load of diabetic foot ulcers**M S Umashankar and K S Lakshmi**
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Diabetic Foot Ulcers (DFUs) are a frequent complication of diabetes with a heavy bacterial load that lead to severe and persistent infections leading to amputation of extremities thereby affecting the quality of life of diabetes patients. Therapeutics currently on usage involves wound dressings which deliver drugs to alleviate pain and foul odors found ineffective until today. The necessity to develop and improve the efficacy of wound healing suitable for DFU treatment has been a challenge for both researchers and clinicians. An ideal formulation of topical nanotechnology-based drug delivery formulation is expected to bring new hope for diabetic foot ulcer treatment. The present investigation is to develop nanogel loaded with second generation cephalosporin for topical applications for the treatment of diabetic foot ulcer, to examine its significance against bacterial load of the DFU by sustained drug release conferring prolonged time of action to improve wound healing. An Innovative aspect of formulating a calcium phosphate nanocarrier system core called as aquasome capable to get coating on its surface a mono or bi lamella of sugars like trehalose or cellobiose forms a sugar coated nanocore which is capable of adsorbing the cephalosporin drug, a phenomenal drug carrying technique. This is formulated into suitable topical antibacterial nanogel. The antibacterial activity of drug-loaded aqua nanogel was tested on bacterial load of diabetic foot ulcer infection against Gram-negative and Gram-positive organisms using agar well diffusion. The zone of inhibition revealed total eradication of pathogens. The results in this research have confirmed that aqua nanogel can be a potential carrier system for cephalosporins drug to target Gram-negative, Gram-positive multi drug resistant microorganisms for the treatment of diabetic foot ulcers. The prepared NPs have been perceived to be stable as carrying positive zeta of more than +50 mV and were displaying homogeneity in both size and shape.

Biography

M S Umashankar has his expertise in novel formulation development and evaluation. He is having more than 12 years of experience in formulation development including mucoadhesive drug delivery systems for various diseases along with teaching and administration positions. Two of his renowned work on biopolymeric pharmaceutical applications have patented under Intellectual Property India.

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