

Development of topical hydrogels containing triple combination of herbal drugs in a nanoemulsion for the treatment of psoriasis

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Abstract

Aim: Nanoemulgel formulations are said to have various advantages over the conventional formulations. The purpose of this study was to develop a stable Curcumin, Resveratrol and Thymoquinone loaded nanoemulsion gel and for topical use in Psoriasis to improve cutaneous deposition and local effect.

Materials & methods: Triple drugs loaded nanoemulsion were prepared by aqueous phase titration method, using oleic acid, Tween 20, PEG 200, and distilled water as the oil phase, surfactant, co-surfactant and aqueous phase, respectively. A nanoemulsion was characterized for quality attributes. Nanoemulgel was prepared by adding 0.5% carbopol 940 as a gelling agent. The topical drug delivery ability of triple drug from nano-emulsion gel was evaluated by in vitro permeation and skin deposition study. Nanoemulgel was further evaluated for spreadability, viscosity, and in vitro efficacy in A-431 cell line, and anti-angiogenesis activity through HET-CAM testing. In vivo performance was evaluated on psoriasis model in BALB/c mice induced by imiquimod.

Results: The result shows that optimized nanoemulsion formulation was composed of Smix in the ratio of 2:1. The optimized Nanoemulsion was found to be relatively uniform in size of 76.20 ± 1.67 nm, with polydispersity index (0.12 ± 0.05). The nanoemulgel showed improved in vitro permeation ability with better drug deposition capacity compared to triple drug solution and gel. The nanoemulgel exhibited desirable spreadability with sustained release pattern (biphasic). A-431 cell

line studies exhibited higher % of growth inhibition of drug loaded NE as compared with the triple drug solution and blank formulation. It is also evinced good antiangiogenic by inhibiting blood vessels formation through HET-CAM testing which manifested an antipsoriatic potentiality. Imiquimod induced psoriatic BALB/c mice revealed significantly higher anti-psoriatic activity of nanoemulgel as compared to free drugs solution and marketed formulation. The developed formulation showed negligible skin irritation despite increased penetration into the skin.

Conclusion: Results indicate that in the treatment of psoriasis, the triple combination of herbal drugs in a Nanoemulgel could be a potential topical formulation.

Biography

She has completed her PhD in Pharmaceutical Sciences. Her Interests is: Pharmacology, Pharmaceutical Sciences and a few more. He is PhD scholar in Department of Pharmaceutics, SPER, Jamia Hamdard, New Delhi-62, India



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