Abstract

Introduction: Fusidic acid, Sodium fusidate have problems in their skin penetration and stability resulting in reduction in their potency, therefore, the objective of this study was to developed FA and SF nanoemulgels to improve their antimicrobial activity.

Method: FA and SF nanoemulgel formulations were prepared by incorporation of FA and SF nanoemulsions with Carbopol hydrogel. First the drugs were screen for their solubility in different oils and surfactants to choose the suitable oil and surfactants for the drugs, and then drugs nanoemulsion formulations were prepared by self-nanoemulsifying technique using Tween 80, Span 20 and pine oil. Drugs nanoemulgel were evaluated for their particle size, polydispersibility index PDI, rheological behavior, drug release and anti-microbial activity.

Results: Based on the solubility test pine oil, Tween 80 and Span 20 showed the highest solubilizing ability for both drugs. The optimum self-nanoemulsifying formulations showed particle size for Fusidic acid and Sodium fusidate 140.58 nm and 151.86 nm respectively and both showed low PDI below 0.3. After incorporating both drug SNEDDS formulations with Carbopol at different concentration, the results of the drugs particle size and PDI showed no significant difference. Zeta potential results for both drugs nanoemulgel showed negative potential with more than 30 mV. All nanoemulgel formulations showed pseudo-plastic behavior with the highest release pattern at 0.4% Carbopol. The antibacterial activity of both drugs nanoemulgel formulations showed superiority over the market product.

Conclusion: Nanoemulgel is promising delivery system for FA and SF that helps in improving their stability and antimicrobial activities