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Preparation of griseofolvin microemulsion for topical delivery and the influence of microstructure on griseofolnin release

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Background and Aims: Griseofulvin is an anti-dermatophytous drug. Currently, because of numerous oral complications, its application is restricted. griseofulvin insoluble in water and oral bioavailability of griseofulvin with poor solubility is limited. In attempt to increase cutaneous drug delivery, microemulsion vehicles have been more and more frequently employed over recent years. Microemulsion formulations have been shown to be superior for transdermal delivery of both lipophilic and hydrophilic compounds. The favourable drug delivery properties of microemulsions appear to mainly be attributed to the excellent solubility properties.
Methods: To find suitable oil, surfactant and cosurfactant the solubility of griseofulvin in various material determined. phase diagrams were constructed. Based on the experience in preparing phase diagrams 8 microemulsion were formulated. Droplet size, Zeta Potential, refractive index, Viscosity, pH, Surface Tension and Conductivity were Measurement. In order to gain information about the microstructure of the microemulsion Scaning electron microscopic (SEM), Small – angle x-ray scattering (SAXS) and differential scanning calorimetry (DSC) were performed. The release rate of griseofulvin from various microemulsion formulations was determined to evaluate the effect of the formulation variables.
Results: The droplet size of microemulsions was ranges from 30.9 nm to 84.3 nm, zeta potential -4.5 to -20.8, refractive index 1.46, Viscosity 254.5 – 381.3cp, pH 5.34 – 6.57, Surface Tension 41.16 -42.83 dy/cm and Conductivity was 0.442 – 0.111ms/cm. DSC results shown o/w microstructure and micrographs from SEM shown reverse micells in all formulations. XRD exhibited lamellar, reverse hexagonal and cubic LC. Drug release from microemulsion was ranges from 22% to 43%.
Conclusion: In vitro release of griseofulvin from formulation 7 and 8 was higher than other formulation Because their microstructure was reverse hexagonal and cubic, as the decrease of surfactant caused reduce solubility of griseofulvin and release of drug from formulation was increased.

Keywords: Microemulsion; Griseofulvin; Microstructure