

Abstract

Silver sulfadiazine is a topical antimicrobial drug for burn wounds infection, its polymeric nature make it insoluble in aqueous and organic media which reduce the toxic activity to microorganism. The aim of this study is to develop a stable Silver sulfadiazine nanoemulgel to increase its topical antibacterial activity to treat burn and wound infections. Silver sulfadiazine nanoemulgel was prepared by mixing drug nanoemulsion with Carbopol hydrogel. Olive oil, Tween 80 and Span 80 were selected based on drug solubility to prepare the nanoemulsion by self-nanoemulsifying technique, and then drug nanoemulgels were prepared and evaluated for their size, PDI, zeta potential, rheology, drug release and antibacterial activity. The results showed that the optimum nanoemulsion formulation has droplet size 171.69 nm and Polydispersibility Index 0.207, after Silver sulfadiazine was loaded in the optimum nanoemulsion the droplet size increase to 250 nm and Polydispersibility Index 0.23. After that formulation was mixed with different concentrations of Carbopol which showed no significant increasing in droplet size and polydispersibility. Zeta potential values of different formulations were lower than -30 mV. According to the rheological test the formulations showed pseudo plastic behavior. In vitro release and antibacterial test Silver sulfadiazine have better result comparing to the market product which will induce the wound healing. as a result silver sulfadiazine nanoemulgel was formulated in this study which showed a better drug release and antibacterial activity compared with a market product and increasing on the its stability and penetration through the skin.