

Ultra-deformable liposomes containing terpenes (terpesomes) loaded fenticonazole nitrate for treatment of vaginal candidiasis: Box-Behnken design optimization, comparative ex vivo and in vivo studies

باللغة الإنجليزية

Fenticonazole nitrate (FTN) is a potent antifungal drug adopted in the treatment of vaginal candidiasis. It has inadequate aqueous solubility hence, novel ultra-deformable liposomes 'Terpesomes' (TPs) were developed that might prevail over FTN poor solubility besides TPs might abstain the obstacles of mucus invasion. TPs were assembled by thin-film hydration then optimized by Box Behnken design utilizing terpenes ratio (X1), sodium deoxycholate amount (X2), and ethanol concentration (X3) as independent variable, whereas their impact was inspected for entrapment efficiency (Y1), particle size (Y2), and polydispersity index (Y3). Design ExpertVR was bestowed to select the optimal TP for more studies. The optimal TP had entrapment efficiency of $62.18 \pm 1.39\%$, particle size of 310.00 ± 8.16 nm, polydispersity index of 0.20 ± 0.10 , and zeta potential of $10.19 \pm 0.2.00$ mV. Elasticity results were greater in the optimal TP related to classical bilosomes. Further, ex vivo permeation illustrated tremendous permeability from the optimal TP correlated to classical bilosomes, and FTN suspension. Besides, in vivo assessment displayed significant inhibition effect in rats from FTN-TPs gel compared to FTN gel. The antifungal potency with undermost histopathological variation was detected in rats treated with FTNTPs gel. Overall, the acquired findings verified the potency of utilizing FTN-TPs gel for treatment of vaginal candidiasis.