



Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Disease

journal homepage: www.elsevier.com/locate/apjtd

Document heading doi: 10.1016/S2222-1808(12)60066-8 © 2012 by the Asian Pacific Journal of Tropical Disease. All rights reserved.

Developing ultra deformable vesicular transportation of a bioactive alkaloid in pursuit of vitiligo therapy

Vinod KR^{1*}, Anbazhagan S², Suneel Kumar M¹, Sandhya S¹, David Banji¹, Prameela Rani A³

¹Nalanda College of Pharmacy, Nalgonda, A.P., India

²Karuna College of Pharmacy, Kerala, India

³College of Pharmaceutical Sciences, Acharya Nagarjuna University, Gundur, A.P., India

ARTICLE INFO

Article history:

Received 29 March 2012

Received in revised form 5 April 2012

Accepted 27 May 2012

Available online 28 August 2012

Keywords:

Transdermal flux

Vitiligo

Piperine

Phosphatidylcholine

Transfersomes

Tape stripping

ABSTRACT

Objective: To develop transfersomal formulation integrated with piperine intended for vitiligo. **Methods:** Film hydration technique was employed in the preparation of transfersomes. Modified diffusion cell, consistency tester were fabricated for *ex vivo* diffusion studies and spreadability studies respectively while tape stripping method was integrated with tissue extraction in the determination of tissue drug concentration. **Results:** When film hydration technique was used for, ultra-deformable vesicles (transfersomes) of piperine in soabean phosphatidylcholine was formed with (67.11±0.22) to (70.55±3.62) and (60.12±1.04) to (80.43±0.14) mean size (μ m) and entrapment efficiency (%) respectively. Transfersomes are capable of crossing the pores in permeability barriers extremely efficient even if the transfersome radius (t_s) is much greater than the pore size (r_{pore}) i.e., $t_s/r_{\text{pore}} \geq 0.25$ the driven flux rate depends on the transdermal osmotic gradient. The vesicles describes elasto-mechanical character of vesicles while penetrating through the pores. The proviso is that the vesicular membrane elasticity is dynamically to the local stress by the external. Diffusion and Spreadability studies showed maximum diffusion when the lipid was kept minimum. Tape stripping and tissue extraction method for the tissue drug retention showed that (75.25±1.72)% drug was retained in the dermis. **Conclusions:** Span 80 was preferred over tween 80 in terms of dermal retention. Size and encapsulation was slightly altered by phosphatidylcholine concentration. The kinetics, efficiency and the transfersome mediated transport can be tailored for trans-epidermal, deep tissues and systemic depending on the vesicular composition, dose and form. Thus we have offered a successful drug delivery of piperine targeting the deep epidermis.

*Corresponding author: Vinod KR, Dept. of Pharmaceutics, Nalanda College of Pharmacy, Hyderabad Main Road, Nalgonda- 508001, A.P., India.

Tel: 0091-9010055001

Fax: 0091- 8682-247910

E-mail: vinodkrpharm@gmail.com