FORMULATION AND EVALUATION OF LIPOSOMAL GEL (HYDROQUINONE & TAZAROTENE) FOR THE TREATMENT OF ACNE

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Abstract
The aim of the present study was to formulate and evaluate the liposomal gel containing tazarotene and hydroquinone in the treatment of acne. Tazarotene combined with gel hydroquinone to maximize the effect of ophthalmic preparation. The optimization batches were prepared by lipid film hydration method with different concentration of lecithin and cholestrol with different varying stirring speed (100 and 200 rpm). All the prepared formulation were characterized for vesicle morphology, particle size and entrapment efficiency by transmission electron microscopy (TEM). The optimized batch of tazarotene liposome TL6 was further incorporated into gel containing hydroquinone. Three different formulations (LF1, LF2, LF3) were prepared using different composition of carbopol (0.5, 1.0 and 2%) The optimized batch of tazarotene and hydroquinone incorporated gel (1%) was characterized for pH, spreadability, viscosity (cps) and in vitro drug release. The percentage drug entrapment efficiency found higher in formulation, Vesicular size and drug entrapment efficiency of the optimized liposomes were found to be 180.4 nm and 69.10% respectively. In-vitro diffusion study demonstrated that the drug diffused from liposomal gel and conventional marketed gel was found to be 98.12% and 98.58% respectively. It can be concluded from the experimental results that the liposomal gel containing tazarotene in combination with hydroquinone has potential application in topical delivery.
Keywords: Tazarotene, Hydroquinone, Liposome, Gel, Topical Drug Delivery

1. INTRODUCTION

Most favourable therapeutic outcomes necessitate appropriate drug selection. In human body, the skin is a best available space for drug delivery.[1,2] In human body skin covers an area of about 2m and this multi-layered.

In total skin surface consist of 1/1000 of hair follicles in every tetragon centimetre of the skin area. The most gladly reachable, [3,4] The aera of skin where the drug is introduced. Skin are most

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important barrier for the access of any materials. Transdermal drug delivery crosses the drug at a control systemic circulation. It has intention narrow aera.[5,6]

There are many advantages of transdermal route of conventional routes. It avoid the first pas metabolism effects, activity of extended period and predictable, side effects can be minimizing, the drug utilise goes shorter half-life, improve in physiological and pharmacological. This helps in avoiding the drug level fluctuation also reduce the variabilities. It helps to improve the patient compliances. [7,8]

For the transfer of drugs dermally and transdermal a vesicular system of drug delivery is introduced. For overcome this problem liposomes are use. The bilayer lipid vesicles, phospholipids and cholesterols.[9,10] Bangham and colleagues discover the liposomes by drug delivery system. The solvents are separated from each other. These solvents are closed, spherical. The exterior envelops of a liposome are allowed to passes the drug by lipophilic skin. This treatment is use for the both local and internal skin disorders. Cosmetic formulation has shown the systemic effects.[11,12]

2.MATERIAL AND METHODS

2.1 Pre-formulation Studies

2.1.1 Physical appearance:

Organoleptic properties are used for the examination of drugs (Tazarotene and Hydroquinone).

2.1.2 Determination of wavelength maxima (λmax):

Around 10mg of each drug are weigh and dissolved into 100ml of PBS (pH 7.4) in a 100ml of volumetric flask. 1ml of solution are pipette out and transfer 10ml of flask and volume was make up with PBS (pH 7.4). UV/Vis double beam spectrophotometer is use for the scanning the solution (200-400nm).

2.1.3 Preparation of Standard Stock Solution:

10mg of drugs are weigh and dissolved into 10ml of PBS (pH 7.4) and makeup the volume and formed a stock solution of 1000 ppm or µg/ml.

2.1.4 Calibration curve of Tazarotene

Form the stock solution(1mg) is taken out and dissolved into 10ml of buffer solution. 0.1, 0.2, 0.3, 0.4 and 0.5 ml solutions are made and transfer into the flask. At 251nm the absorbance of