

Kojic acid and hydroquinone non-ionic surfactant vesicles for topical application

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Abstract

Introduction:

Pigmentation disorders are common skin diseases caused by a wide range of etiologic factors such as pregnancy, sunshine and some drugs, for example minocycline etc. Vesicle-entrapped anti-hyperpigmentation agents can protect the therapeutic compounds from environmental destructive causes (light, oxygen and ...) and they also provide a sustained release condition in the skin application of these medications. Hereby, we present the initial report, on the basis of our knowledge, on a niosomal preparation with two active pharmaceutical agents.

Methods and Results:

Kojic acid (KA) and hydroquinone (HQ) were chosen as typical depigmentation agents. Many niosomal formulations were prepared by film hydration method in which co-encapsulation or separate entrapment of these compounds were evaluated. Span (20, 40, 60 or 80), Tween (20, 40, 60 or 80) and cholesterol were the main bilayer formation compounds and deionized water, normal saline and phosphate buffer were utilized as hydration media. A few formulations resulted in formation of stable multilamellar vesicles (MLVs) with high encapsulation efficiency of active agents. Therefore, we used direct mixing method for niosome formation which showed appropriate formulation properties with average volume diameter less than 10 μm , high encapsulation efficiency and high protection ability for HQ against oxidation depicted as no color change was detected during the long term storage in open door jars. Release studies on prepared formulations showed a sustained drug delivery profiles for all vesicular formulations.

Conclusions:

Obtained results promised a new and appropriate drug delivery system for KA and HQ. Clinical trials with permitted ethical requirements should be done for application of these niosomes in topical niosomal gel, cream or lotion formulations.

Keywords: Kojic acid, Sorbitan esters, Hydroquinone, Oxidation, Stability, Topical drug delivery

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