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Identification of Steroidal Content in Different Brands of Beauty Creams by Thin Layer Chromatography (TLC)

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ABSTRACT

Beauty creams or skin lightening creams or ointments are widely used worldwide either to attempt to remove localised dark patches. These preparations may contain Topical corticosteroids.The prolong usage of high potency steroids in various dermatoses can causes local and systemic adverse effects.Sufficient amount of quantity of eight different brands (A, B, C, D, E, F, G, H) of whitening creams are extracted separately with 25ml of solvent. Standards solutions of following compounds i.e.,hydrocortisone, dexamethasone & betamethasone is prepared. The samples as well as the standards are applied separately on the TLC plates. A thin-layer chromatographic analysis was carried out on silica gel glass plates, using eluants and detection reagents. The aim of study is the identification and determination of steroidal content in beauty creams and to propose a simple and cost effective method.There is no indication of the presence of steroid compounds in any of the eight brands of the beauty creams.

Keywords: *UV lamp, Beauty Creams, Cortisone Acetate, Hydrocortisone, Prednisolone, Dexamethasone & Betamethasone*

INTRODUCTION

Beauty creams or skin lightening creams or ointments are widely used worldwide either to attempt to remove localized dark patches such as melasma orpost inflammatory hyperpigmentation or as a fashion trend aiming to reduce normal melanin in the skin. These creams may contain a variety of ingredients. In many areas, unregulated products are sold, often without listing their contents or they are labeled incorrectly. They may be safe but completely ineffective, or the chemicals may result in side effects and toxicity. They may contain Topical corticosteroids.

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The use of Topical corticosteroids (TCs) in dermatology was initiated in 1952 and now it is one of the most extensively used therapeutic formulations in practice.[1]TCs creams offer rapid symptomatic relief in many inflammatory dermatoses, especially in short-term. But Due to regular and frequent usage of high potency steroids in various dermatoses, local and systemic adverse effects are likely. The common local adverse effects with these preparations include skin atrophy, telangiectasia, [2] purpura, striae, skin pigmentation, acneiform eruptions, rosacea, and dermatitis. Another important phenomenon which can occur with continuous use of topical steroids is tachyphylaxis and abrupt discontinuation can lead to rebound dermatological condition. [3] Betamethasone

is a corticosteroid used in topical preparations to relieve skin irritation, itching and flaking from eczema. It is also used as a treatment for local psoriasis. [2]Dexamethasone is also a type of corticosteroid medication. It is used topically for the treatment of, a number of skin diseases, severe allergies. The long term use of this drug may result in thrush, bone loss, cataracts, easy bruising, or muscle weakness. [4]Hydrocortisone is used to treat a variety of skin conditions. Hydrocortisone reduces the swelling, itching, and redness that can occur in these types of conditions. This is a mild corticosteroid. [5]

The aim of study is to propose a simple and cost effective method for the identification of steroidal contents in beauty creams. There are various thin-layer chromatography–high- performance liquid chromatography method, mass spectropfotometric methods for the identification and determination of corticosteroids in cosmetic products [7-10] but they are very time consuming and are not very cost effective. Our proposed method does not utilize expensive organic solvents.

METHODOLOGY

Material and Reagents

The T.L.C glass plates of size 200 X 200 nm coated with keiselguhr 50 HF 254, T.L.C glass tank to accommodate to coated chromatographic plates, beakers, volumetric flask, measuring cylinder, pipette and stirrer were used. All glass wares were washed and rinsed with double distilled water. Reagents used were as follows a mixture of Dichloromethane, Ether, Methanol and water in ratio of 77:15:8:1.2 is used as mobile phase. 0.5% solution of Triphenyleterazolium chloride in alcohol 95% and then 5 ml of it is diluted to 50ml with 2M NaOH is used as spraying agent. All the Reagents were of Analytical grade.

Instruments

UV Lamp having output at 254nm and 356 nm.

Preparation of sample solution

Sufficient amount of quantity of eight different brands(A, B, C, D, E, F, G, H) of whitening creams are extracted separately with 25ml of solvent (9 Volume of chloroform and 1 Volume of methanol), solvent is then evaporated up to 10ml and kept in a stoppered test tube for the application on the chromatographic plate.

Preparation of standard solution

0.25% of the solution of following standards i.e., hydrocortisone, dexamethasone & betamethasone is prepared in a mixture of 9 Volume of chloroform and 1 Volume of methanol.

Procedure

The samples as well as the standards is applied separately on the plate with the help of a micro pipette about 2 micro liter. The chromatographic plate is then allowed to ascend in the mobile phase (77 volume of dichloromethane, 15 volume of ether and 8 volume of methanol and 1.2 volume of water. The plate is then removed after the mobile phase has ascended to the top of the plate; the plate is then dried and heated to 120 degree centigrade. It is then sprayed with the reagent(0.5% solution of Triphenyleterazolium chloride in alcohol 95% and then 5 ml of it is diluted to 50ml with 2M NaOH) and is again heated for further 10 minutes. The plate is then examined under UV lamp.

RESULT AND DISCUSSION

Beauty creams or skin lightening creams or ointments are widely used worldwide either to attempt to remove localized dark patches. These preparations may contain Topical corticosteroids. The prolong usage of high potency steroids in various dermatoses can causes local and systemic adverse effects. Sufficient amount of quantity of eight

different brands (A, B, C, D, E, F, G, H) of whitening creams are extracted separately with 25ml of solvent. Standards solutions of following compounds i.e., hydrocortisone, dexamethasone & betamethasone is prepared. The samples as well as the standards are applied separately on the TLC plates. A thin-layer chromatographic analysis was carried out on silica gel glass plates, using eluants and detection reagents. The aim of study is the identification and determination of steroidal contents in beauty creams and to propose a simple and cost effective method. There is no indication of the presence of steroidal content in any of the eight brands of the beauty creams, as shown in fig. 2.

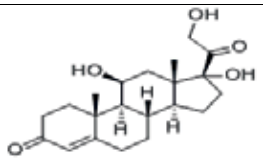
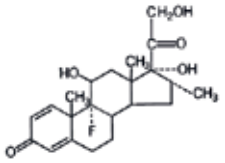
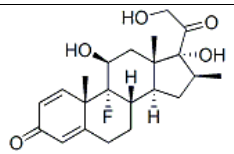
Chemical Name	Structure
Hydrocortisone	
Dexamethasone	
Betamethasone	

Fig. 1. Structure of steroids

CONCLUSION

We can conclude that there is no indication of the presence of steroidal content in any of the eight brands of the beauty creams.

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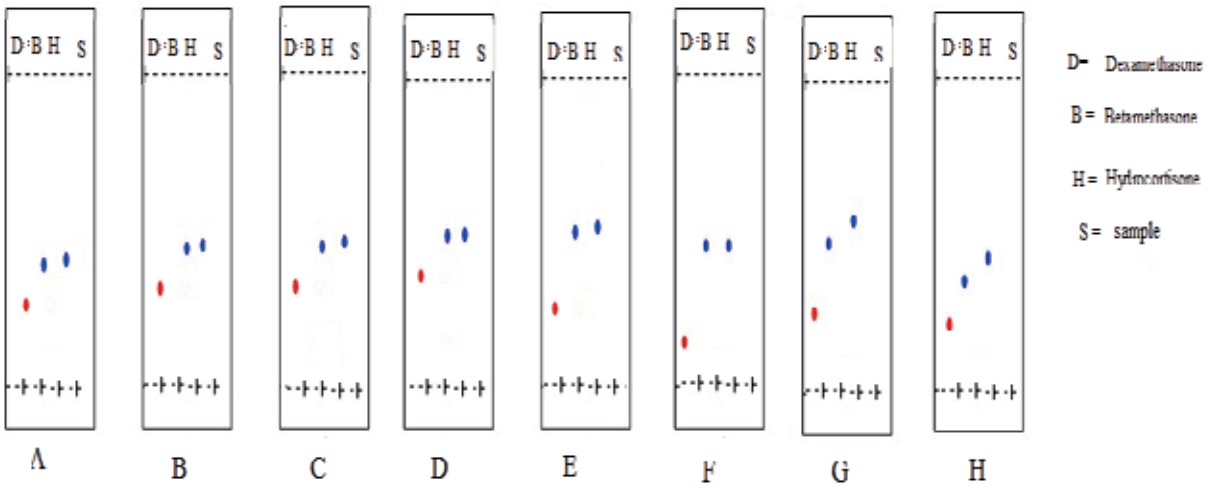

Fig. 2. TLC of different Sample

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