ASSESSMENT OF BETAMETHASONE-IN-CYCLODEXTRIN-IN-LIPOSOME-INDUCED SKIN BLANCHING RESPONSE

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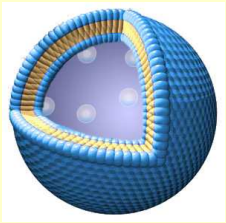
INTRODUCTION

The aim of this study is to evaluate the skin blanching induced effect of liposomes containing a betamethasone-cyclodextrin (HPγCD) complex solution and to compare the obtained effect to that of different preparations containing 0.1 % betamethasone.

Inclusion of betamethasone in HPγCD allows to obtain high betamethasone encapsulation levels in liposomes. Liposomes are supposed to increase the efficacy of betamethasone and to obtain an extended release of betamethasone.



EXPERIMENTAL PROTOCOL

A study was carried out on 10 volunteers. The study protocol was approved by the Ethical Committee of the University of Liège. 4 sites of 1.76 cm2 were used per forearm and were allocated randomly. One site received a placebo treatment (NT) and the other sites received one of the four preparations containing betamethasone (0.1%):

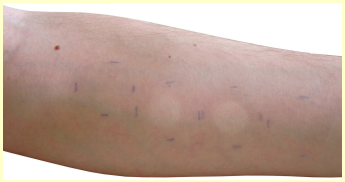


Figure 1: Picture of the forearm of volunteers after 5 hours application of betamethasone gels

LC: liposomes made from phosphatidylcholine, containing a betamethasone-HPγCD complex solution and dispersed in carbomer to obtain a gel
T: a reference gel containing betamethasone dissolved in ethanol
C: a gel containing a betamethasone-HPγCD complex solution
B: Betnelan V® cream from GSK laboratories containing betamethasone valerate 0.121 %

Preparations were left in situ for 5 hours after which sites were gently washed. Skin blanching effect was evaluated by chromameter assessment (Minolta CR200).

RESULTS AND DISCUSSION

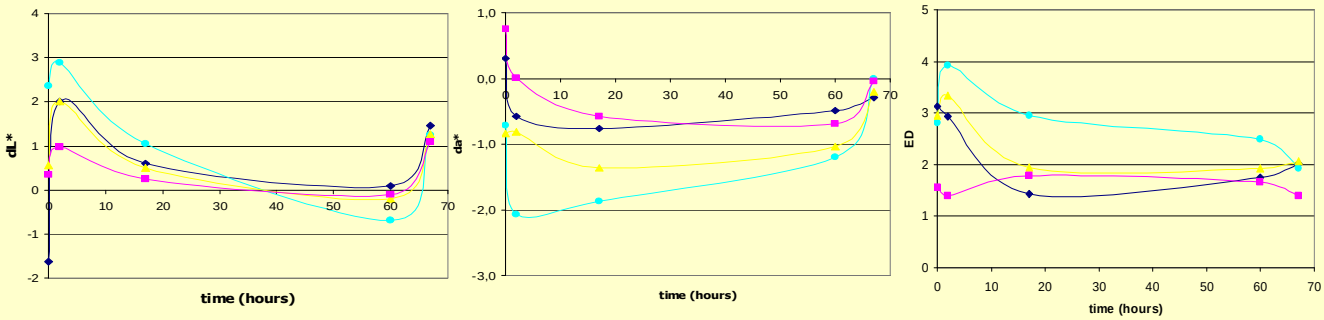


Figure 2: Evolution of colour parameters (da*, dL* and ED) after 5 hours application of the different preparations containing betamethasone: T B C LC

Luminancy L* is expressed on a scale ranging from 0 for black to 100 for white. In the colour wheel, a* and b* indicate two orthogonal colour axes, with a* being the red (+100) and green (-100) axis and b* the yellow (+100) – blue (-100) axis. The difference between two colours is estimated by the Euclidian distance (ED): $(dL^2 + da^2 + db^2)^{1/2}$

No significant difference was found between C, LC and T. *In vivo*, the efficacy of betamethasone is not increased neither by cyclodextrins nor by liposomes. The use of cyclodextrins and liposomes does not increase the absorption of betamethasone. No reservoir effect of liposomes was observed. Betnelan® is still the most effective preparation containing betamethasone.

CONCLUSIONS

The new formulation containing betamethasone-in-cyclodextrin-in-liposomes is not more effective than a hydroalcoolic gel containing betamethasone. Betnelan® containing betamethasone valerate, is the most effective preparation. Other lipids constituting liposomes should be tested in order to increase their affinity for the skin.