Abstracts

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High levels of UV inducible free radicals in suncare products can induce Acne aestivalis in sensitive subjects

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Abstract

There is evidence, that peroxide free radicals in sun screen products, deriving from certain formulation components, are involved in the induction of photo-allergic reactions. These UV inducible free radicals can be assessed in situ by an ESR-based method, the so called Radical Power (Potential???) (RP), by exposing formulations to UV irradiation.

The aim of this study was to find a correlation between the amount of UV inducible peroxides of sunscreen products and the clinical symptoms of Acne aestivalis.

Two almost identical sunscreen products with UVB SPF 30 and comparable protection in the UV A range, but based on two different organic sunscreen systems have been selected.

In situ ESR analysis revealed a substantial difference in the RP value, 45.3 + 1.0 % (UVA/B irradiation) and 21.9+0.2% (UVA irradiation) for formula 12/2. In contrast to 12/2, formula 12/1 had an RP value of 0 %, which means, that it was free of any UV inducible free radical potential.

Both formulations were tested in a clinical study in 6 subjects with a history of a. aestivalis, using suberythemal doses of UV for a period of 5 days. In case of 12/2 five out of six subjects showed symptoms of a. aestivalis, whereas none in case of product 12/1.

To our knowledge these results for the first time provide direct evidence for a strong correlation between UV inducible free radicals of formulations and the potential to induce a. aestivalis in sensitive subjects. Furthermore it offers a rationale for the development of low risk sunscreen formulations by selection of suitable filter systems combined with in situ ESR analysis.