Vitamine E

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Direct evidence for bioconversion of vitamin E acetate into vitamin E: An ex vivo study in viable human skin

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Synopsis

For better stability, vitamin E is commonly used as the non-active esterified pro-drug. Such esters are postulated to be hydrolyzed to the free active form by skin-related esterases. So far, successful conversion of esterified vitamin E to free vitamin E (tocopherol) has been mainly delineated from observed biological effects. Quantitative evidence in human skin is poor. In vitro and in vivo studies on human and animal skin have proved ambiguous. Formulation-based effects may have added to this controversy. In the present study, comparable amounts of vitamin E acetate (i) in oil (Mygliol-812N), (ii) surfactantsolubilized in water, (iii) encapsulated in liposomes, or (iv) encapsulated in Nanotopes™ were applied to human skin mounted in modified Franz-perfusion chambers that permit emulation of both open or occlusive conditions. The distribution of vitamin Etotal (vitamin E acetate + vitamin E) was assessed on the skin surface, in the horny layers, and in the underlying skin by high-pressure liquid chromatography (HPLC), with a recovery higher than 90%. Vitamin E acetate in Mygliol deposited exclusively on the surface and in the stratum corneum. In contrast, solubilized or encapsulated vitamin E acetate deposited also in the underlying skin. Nanotopes™ performed best, followed by liposomes and solubilized vitamin E acetate. Non-occlusive application favored deposition in the skin relative to occlusive application. Conversion of vitamin E acetate to vitamin E was not observed on the skin surface or in the horny layers, while in the underlying skin up to 50% of the vitamin E total was deacetylated.