

Effects of Unsaturated Fatty Acid and its Oxidized Products to Skin Stratum Corneum

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Effects of unsaturated straight-chain fatty acid and its oxidized products on skin stratum corneum were examined using rat skin permeation of drugs in *in vitro* and FT-IR method. We investigated that the effects of pretreatments of high purity oleic acid and its oxidation products on the permeations of indomethacin, as relatively lipophilic compound and 6-carboxyfluorescein (6-CF), as hydrophilic compound through rat skins. The skin permeations of indomethacin and 6-CF were very low (diffusivity; 2.3×10^{-6} and 0.19×10^{-6} cm²/h, respectively). Permeations of indomethacin and 6-CF were significantly increased by pre-treatment with oleic acid or its first and second oxidation products.

The frequency of the asymmetric CH bond stretching absorption (2919 cm⁻¹) on FT-IR spectra of stratum corneum was shifted to higher wavenumber (7.5cm⁻¹) by the treatment of high purity oleic acid. Therefore, the perturbation increase of lipid domain in stratum corneum by oleic acid. The degree of shift was decreased by first and second oxidized products of oleic acid. On the other hand, the frequency of the α -helix NH deformation of amide I (1548 cm⁻¹) on FT-IR spectra of stratum corneum was shifted to higher wavenumber (2 cm⁻¹) by the treatment of high purity oleic acid. The shift significantly increased by first oxidized product with highest peroxide value (85.7 meq/kg). Therefore, keratin cell in stratum corneum should be affected by first oxidized product with high peroxide value.