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Dietary fish oil reduces basal and ultraviolet B-generated PGE2 levels in skin and increases the threshold to provocation of polymorphic light eruption.

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Abstract

The sunburn response is markedly reduced by dietary fish oil rich in omega-3 polyunsaturated fatty acids. Because prostaglandins mediate the vasodilatation, we examined the effect of fish oil on ultraviolet (UV) B-induced prostaglandin metabolism. In addition we assessed the potential photoprotective effect of fish oil in light-sensitive patients. Thirteen patients with polymorphic light eruption received dietary supplements of fish oil rich in omega-3 polyunsaturated fatty acids for 3 months. At baseline and 3 months, the minimal erythema dose of UVB irradiation was determined, and a graded UVA challenge given to a forearm to assess the threshold dose for papule provocation. Suction blisters were raised on the other forearm, on control skin, and on skin irradiated with four times the minimal erythema dose of UVB 24 h previously, and blister fluid prostaglandin E2 was measured by radioimmunoassay. Following 3 months of fish oil, the mean minimal erythema dose of UVB irradiation increased from 19.8 +/- 2.6 to 33.8 +/- 3.7 mJ/cm2 (mean +/- SEM), $p < 0.01$. The UVA provocation test was positive in 10 patients at baseline, and after 3 months nine of these showed reduced sensitivity to papule provocation, $p < 0.001$. Before fish oil, PGE2 increased from 8.6 (SEM 2.1) ng/ml in control skin to 27.2 (11) ng/ml after UVB, $p < 0.01$. Following 3 months of fish oil, PGE2 decreased to 4.1 (1) and 9.6 (2.4) ng/ml in control and irradiated skin, respectively, $p < 0.05$. Reduction of UV-induced inflammation by fish oil may be due, at least partially, to lowered prostaglandin E2 levels. The photoprotection against UVA-provocation of a papular response suggests a clinical application for fish oil in polymorphic light eruption.