Rapid Sun-induced Immune Changes Precede Clinical Effects in Psoriasis

Rapid immunological effects of sun exposure precede and presumably mediate clinical improvement in Scandinavian patients with psoriasis during climate therapy on the Canary Islands.

This is a summary of a paper recently published by Søyland et al. The reference is: *Søyland E, Heier I, Rodriguez-Gallego C, Mollnes TE, Johansen F-E, Holven KB, Halvorsen B, Aukrust P, Jahnsen FL, de la Rosa Carrillo D, Krogstad A-L, Nenseter MS. Sun exposure induces rapid immunological changes in skin and peripheral blood in patients with psoriasis. Br J Dermatol 2011; 164: 344–355.*

Ultraviolet (UV) radiation has immunosuppressive effects, and natural sun exposure is used as a treatment for psoriasis. T cells infiltrate psoriatic skin in great numbers and are central to the pathogenesis of the disease. Most studies on the immunosuppressive effects of UV radiation have been performed in animal models, and data from humans are scarce. Results from a study in Scandinavian psoriatic patients enrolled in a heliotherapy programme on the Canary Islands have recently been published in the British Journal of Dermatology.

Twenty patients with moderate to severe plaque psoriasis were flown from Norway to the Canary Islands and subjected to controlled sun exposure. Psoriasis Area and Severity Index (PASI) scores were evaluated. Skin biopsies were obtained from lesional and non-lesional skin at baseline and on days 2 and 16, and examined by immunohistochemistry and polymerase chain reaction. At the same time points, blood samples were obtained and examined for T-cell subsets and cytokine production.

All patients experienced clinical improvement, with a mean PASI score reduction of 78% after 16 days. Exposure to natural sunlight induced rapid reductions in CD4+ and CD8+ T- cell numbers in the epidermal and dermal compartments of psoriatic skin, as well as in circulating skin homing T cells, with reductions in cell numbers occurring as early as day 2. In contrast, dermal FOXP3+ T-cell numbers increased in lesional skin, but not in non-lesional skin. *In vitro*-stimulated peripheral mononuclear cells demonstrated reduced capacity to secrete cytokines such as interferon-γ, interleukin-10, interleukin-17 and tumour necrosis factor-α after 16 days, indicating a systemic immunosuppressive effect.

The authors state that the rapid reductions in the levels of local and systemic inflammatory markers strongly suggest that immune modulation mediated the observed clinical effect of sun exposure during climate therapy, although other factors, such as stress reduction, may also contribute.

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