

Vitamin D status in psoriasis patients treated with UVB therapy

Akademisk avhandling

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av

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I Osmanovic A, Landin-Wilhelmsen K, Larkö O, Mellström D, Wennberg AM, Hulthén L, Krogstad AL. UVB therapy increases 25(OH) vitamin D synthesis in postmenopausal women with psoriasis. *Photodermatol Photoimmunol Photomed* 2007; 23(5): 172-8.

II Osmanovic A, Landin-Wilhelmsen K, Larkö O, Mellström D, Wennberg AM, Hulthén L, Krogstad AL. Risk factors for osteoporosis and bone status in postmenopausal women with psoriasis treated with UVB therapy. *Acta Derm Venereol.* 2008; 88(3):240-6.

III Osmanovic A, Landin-Wilhelmsen K, Larkö O, Wennberg AM, Krogstad AL. Vitamin D production in psoriasis patients increases less with narrowband than with broadband ultraviolet B phototherapy. *Photodermatol Photoimmunol Photomed*, 2009 (in press).

IV Osmanovic A, Nilsen LT, Landin-Wilhelmsen K, Søyland E, Abusdal Torjesen P, Hagve TA, Nenseter M, Krogstad AL. Effect of climate therapy at Gran Canaria on vitamin D production, blood glucose and lipids in patients with psoriasis. *J Eur Acad Dermatol Venereol*, 2009 (in press).

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Abstract

The thesis deals with the effect of ultraviolet B (UVB) 280-320 nm on vitamin D production in psoriasis patients during treatment with phototherapy.

Background: Psoriasis is a chronic, inflammatory disease affecting the skin and potentially the joints. Both genetic and environmental factors are important in the aetiology of the disease. Phototherapy (broadband UVB, narrowband UVB (NBUVB) and heliotherapy) is commonly used as treatment of psoriasis.

Vitamin D₃, or cholecalciferol, is produced in the basal epidermis by ultraviolet radiation (290-315 nm) of 7-dehydrocholesterol and hydroxylated in the liver to the major circulating metabolite 25-hydroxyvitamin D [25(OH)D]. Hydroxylation to 1,25-dihydroxyvitamin D [1,25(OH)₂D] in the kidneys is stimulated by parathyroid hormone (PTH) and suppressed by phosphate. Sun exposure is the strongest factor influencing 25(OH)D.

Aims: 1) To study the effect of UVB on vitamin D synthesis in patients with psoriasis. 2) To examine possible differences between NBUVB and broadband UVB on vitamin D production in psoriatic patients. 3) To investigate the effect of UVB induced vitamin D on bone, lipid and carbohydrate status in psoriasis patients.

Methods: Serum 25(OH)D, 1,25(OH)₂D, PTH, calcium and creatinine were measured before and after the phototherapy in white, Caucasian patients with active plaque psoriasis. Bone mineral density (BMD) was examined using Dual-Energy X-ray Absorptiometry (DEXA) in postmenopausal women with psoriasis. Lipid and carbohydrate status were assessed in patients treated with heliotherapy.

Results: Psoriasis improved in all patients, with a 75% reduction in PASI (Psoriasis Area and Severity Index) score on all regimes. Serum 25(OH)D increased and PTH decreased after phototherapy. The increase in 25(OH)D was higher in the broadband treated patients compared with NBUVB. There was no correlation between the dose of UVB and the increase of 25(OH)D. Postmenopausal women with psoriasis had higher BMD both at the hip and at the lumbar spine than age-matched controls. The ratio of low-density lipoprotein (LDL) and high-density lipoprotein cholesterol (HDL), and the levels of glycosylated haemoglobin A_{1c} (HbA_{1c}) decreased during heliotherapy.

Conclusion: UVB and heliotherapy increased the serum 25(OH)D production, reduced the serum PTH concentrations and improved psoriasis, lipid and carbohydrate status in the patients. Vitamin D production in psoriasis patients increased less with NBUVB than with broadband UVB phototherapy. Postmenopausal women with psoriasis had higher BMD than age-matched controls, a finding that could be related to their higher body weight, physical activity and the UVB exposure.

Key words: Vitamin D, PTH, psoriasis, bone mineral density, ultraviolet UVB

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