Acta Derm Venereol (Stockh) 1994; Suppl. 186: 85–87

Tacalcitol in Psoriasis: A Video-Microscopy Study

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Video-microscopy is a video-imaging system which permits direct visualization of the skin surface and capillaries, by using a microscope attached to a camera, a video-recorder and a printer. This technique provides information on the morphology of capillaries in vivo and has been used both for research into normal skin microcirculation and as a clinical method to detect capillary changes in psoriasis and other skin diseases. The aim of this study was to evaluate the morphology of capillaries in psoriatic plaques before and after treatment with tacalcitol, a new topical vitamin D3 analogue. Clinical evaluation was made after 3 and 6 weeks of therapy. After 3 weeks a reduction in erythema and scaling was noted; and areas in which capillaries were less tortuous became evident. After 6 weeks, capillaries were less dilated and tortuous in the whole plaque and had lost the large and tortuous appearance of active psoriasis. ***Key words: tacalcitol; psoriasis; video-microscopy.***

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Tacalcitol is an active vitamin D3 derivative whose action of inducing cell division and of inhibiting cell proliferation is as good as or superior to that of calcipotriol (1α,25-(OH)2D3); it is assumed that this action is due to the binding with protein receptors specific to 1α,25-(OH)2D3 in the epidermal cells. However, since the effects of TC on the systemic calcium metabolism are less prominent, TC is deemed safer (1, 2, 3).

The aim of the present study was to demonstrate skin surface and capillary changes is psoriatic plaques during treatment with TC, using a video-imaging system.

Table I. *Quantitative VM evaluation of psoriatic plaques*

0, no response; 1, slight improvement; 2, moderate improvement; 3, marked improvement and 4, complete resolution

Patient no.	Sex/Age	Location	1st week			3rd week			6th week		
			E	S	TC	E	S	TC	E	S	TC
1	F/62	Elbow	4	4	4	2	3	4	0	1	4
2	F/33	Knee	3	4	4	2	3	3	1	2	3
3	M/33	Leg	2	2	4	2	2	4	3	2	3
4	M/59	Elbow	4	4	4	3	3	3	2	1	1
5	M/61	Leg	4	4	4	3	3	3	0	0	1

E = Erythema; S = scales; TC = tortuous capillaries.

MATERIAL AND METHODS

Five patients, from a multicentric double-blind study, who had chronic plaque psoriasis (3 males, 2 females) were studied (Table I). TC ointment 4 μg/g was applied once a day, without occlusion, to some plaques on their limbs. Treatment lasted 6 weeks. A 2-week wash-out period was carried out during which only white or 3% salicylic Vaseline could be applied. The following laboratory parameters were evaluated at the beginning of the study and after 3 and 6 weeks: serum calcium, albumin, creatining, phosphorus; alkaline phosphatase, lactate dehydrogenase, glutamic-pyruvic transaminase, blood cell count, thrombocytosis. Every week, serum albumin and calcium determinations were also performed. At the beginning of the study and after 3 and 6 weeks the psoriatic plaques were evaluated with video-microscope apparatus (VM) (4, 5) in order to study their evolution during the treatment.

The apparatus (Moritex Video Microscope System Scopeman, MS-504, Meisei Bldg., Japan) consists of a processing unit and a colour monitor (14"TTL CVS); light from the light source (a 100 W mercury vapour lamp) of the processing unit is guided with the optic fibre to the probe end. Objectives are equipped with non-contact lenses (×25, ×50) and with a contact lens (×200). A still video recorder and a colour printer may be attached. With this instrument we evaluated erythema, scales and capillary morphology. The effects of treatment were eval-

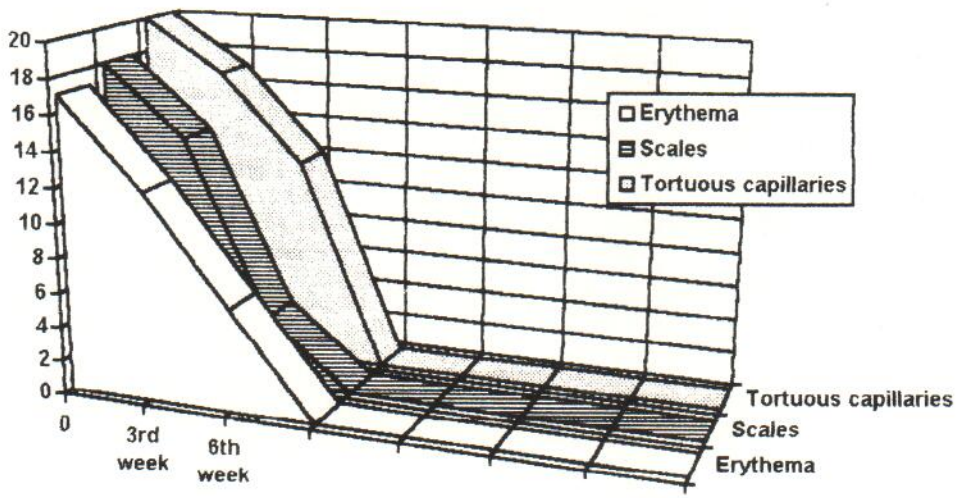

Fig. 1. Graphic representation of the behaviour of the parameters studied using VM during treatment with TC.

 ISSN 0365-8341

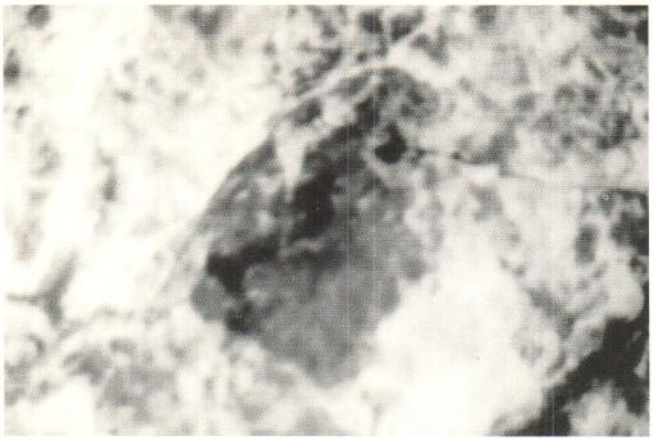

Fig. 2. Psoriatic plaque before the treatment (VM, ×50).

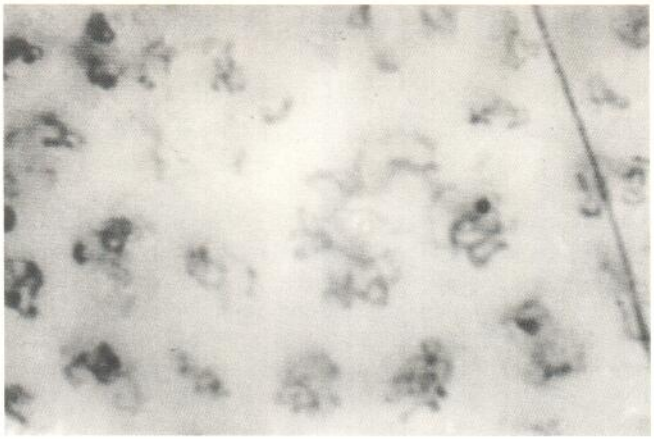

Fig. 4. Psoriatic plaque before treatment: tortuous capillaries are visible. This is a highly characteristic vascular pattern. VM, ×200).

uated by comparing video-microscope photographs taken at each examination and were scored as: 0, no response; 1, slight improvement; 2, moderate improvement; 3, marked improvement, and 4, complete resolution.

RESULTS

The results are reported in Table I and Fig. 1. Erythema was remarkably reduced after 6 weeks of therapy and had disappeared completely in 2 patients. Scales disappeared in one case and were considerably reduced in 2 others (Figs. 2–3). The grossly dilated and tortuous aspect of psoriatic capillaries also appeared to be reduced: a marked simplification of the coiling of the capillary ball occurred after 3 weeks in 2 cases. A prominent subpapillary plexus became clearly evident after 6 weeks in another case (Figs. 4–5).

DISCUSSION

The results of the present preliminary study demonstrate that VM is a good tecnique for the evaluation of psoriatic plaques during a specific treatment. It allowed us to study in vivo, with precision and high magnification, erythema, scales and capillary morphology. Once the technique has been mastered, patient examination requires little time and good photographs and slides are obtained. A video-recorder is very useful for providing a large archival database but the images are of poorer quality than those seen directly on the screen. The results of VM examinations seem to confirm the good therapeutic activity of TC. The drug was well tolerated by the patients. According to Kato et al. (2) the scale component improved more than erythema. In our opinion, the fact that variations in capillary morphology may be demonstrated during treatment is of interest; in fact the vascular pattern of active psoriatic plaque is highly characteristic. To the best of our knowledge a VM study has never been performed before in psoriatic plaques treated with TC. We consider VM to be a very useful technique with which to evaluate the results of topical and systemic therapies for psoriasis.

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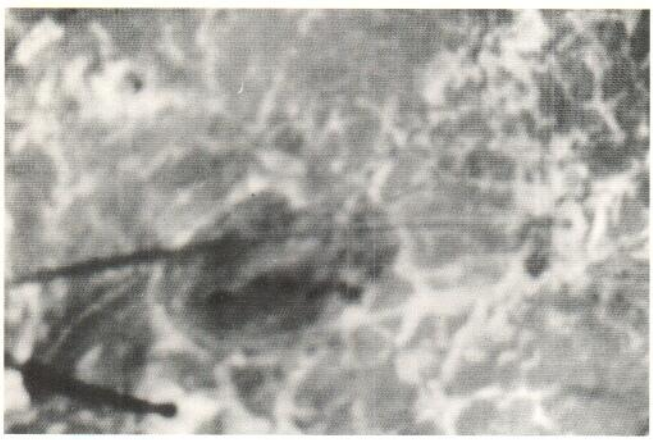

Fig. 3. Remarkable reduction in erythema and scaling after 6 weeks of therapy (VM, ×50).

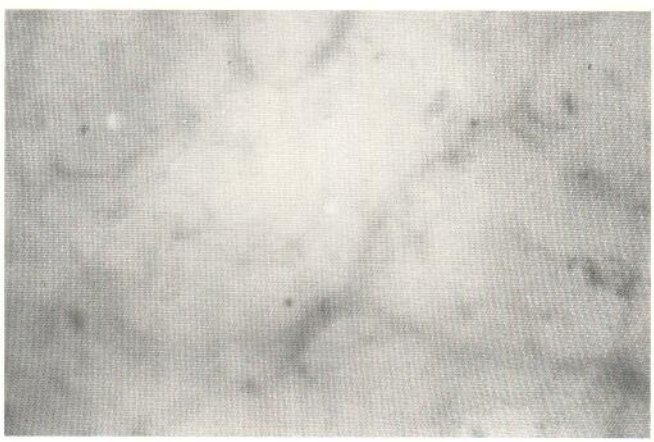

Fig. 5. Marked simplification of the coiling of the capillary ball after 6 weeks of therapy; the prominent subpapillary plexus is clearly visible, as in normal skin. (VM, ×200).

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