Acta Derm Venereol (Stockh) 1994; 74: 143–146

Weekly Treatment of Psoriasis with a Hydrocolloid Dressing in Combination with Triamcinolone Acetonide

A Controlled Comparative Study

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In a within subject comparison, the efficacy and the tolerability of topical treatment with triamcinolone acetonide under a hydrocolloid dressing were compared with triamcinolone acetonide monotherapy, monotherapy with hydrocolloid dressing and triamcinolone acetonide under plastic occlusion.
The clinical efficacy of hydrocolloid dressing as a monotherapy and the pronounced clinical efficacy of this occlusive in combination with triamcinolone acetonide were confirmed.
Comparing the hydrocolloid dressing (Duoderm E) and the plastic semi-occlusive (Opsite IV 3000), we concluded that the tolerability of both approaches was similar. However, Duoderm E in conjunction with triamcinolone acetonide was highly effective, whereas Opsite IV 3000 in combination with this steroid only had an inconspicuous antipsoriatic potential. ***Key words: Corticosteroids; Occlusion; Therapy.***

(Accepted September 11, 1993.)

Acta Derm Venereol (Stockh) 1994; 74: 143–146.

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For more than two decades it has been known that occlusive dressings have a therapeutical efficacy in psoriasis (1, 2). The pronounced antipsoriatic potential of corticosteroids applied under plastic occlusion is a well known and time honoured approach in dermatotherapy. An important drawback of plastic occlusion during prolonged periods of use is irritation and maceration of the skin. Of the patients treated with plastic occlusion 25% developed folliculitis and pustules (2).

An improvement in occlusive treatment is the application of a hydrocolloid dressing (HCD). HCD can remain on the skin for prolonged periods without causing irritation. Telfer et al. reported that irritation of the skin was observed in only 5.8% of psoriatic patients treated for 10 weeks with Actiderm (4), a hydrocolloid patch specially designed for dermatotherapy (5).

Recently it has been demonstrated that the application of HCD on psoriatic plaques has an antipsoriatic potential (4, 6). Topical corticosteroids, applied once a week in combination with the application of an HCD for one week, have been shown to be highly effective in the treatment of psoriasis (7–10).

The objectives of the present investigation were:

(i) To confirm whether HCD, applied once a week, is an effective treatment of psoriasis;
(ii) To confirm that HCD, applied once a week, in combination with weekly applications of triamcinolone acetonide (TACA) is highly effective in the treatment of psoriasis;
(iii) To compare the efficacy of HCD in combination with TACA and the efficacy of plastic occlusion in combination with TACA.

The experimental approach was a controlled 4-way within patient comparative study of 3 weeks' duration between: HCD Duoderm E monotherapy, HCD Duoderm E combined therapy with TACA 0.1% lotion (weekly applications), TACA 0.1% lotion (twice daily) monotherapy, plastic occlusion Opsite IV 3000 combined therapy with TACA 0.1% lotion (weekly applications).

PATIENTS AND METHODS

Patients

This investigation took place in two centres, and a total of 40 patients participated.

Patients were included only if they were older than 16 years and not currently using any medication. For at least 2 weeks they had received no topical treatments; for 2 months they had not been treated with phototherapy or photochemotherapy and for at least 6 months no systemic antipsoriatic drugs had been prescribed. The disease was in a chronic stationary phase in all patients.

In total 17 male and 23 female patients were included. The percentage body surface affected by psoriatic plaques varied between 1 and 18%.

Applications

In each of the two centres two investigators participated. One investigator consistently applied and changed the dressings. The other investigator assessed the clinical parameters without being informed of the nature of each treatment. However, the unoccluded lesion was not blinded as the patient was aware of this test site.

Four lesions of comparable severity were selected in each patient. The applications were carried out by the same investigator every week according to a randomization schedule. Each plaque was assigned a specific treatment through the study. The applications were removed and renewed every week for 3 weeks. The occlusives were not fixed with tape or any dressing. If the applications came off, the renewed application was carried out earlier by the investigator. Patients were permitted to continue routine daily activities, including showers and sport.

As an HCD Duoderm E (ConvaTec, Rijswijk, The Netherlands) was selected. To two test plaques HCD was applied once a week; one of these test plaques was pretreated with TACA 0.1% lotion (Squibb & Sons Inc, Princeton, USA). As a plastic occlusive dressing Opsite IV 3000 (Smith and Nephew, Hoofddorp, The Netherlands) was selected. At one test plaque this plastic occlusive was applied once a week following pretreatment with TACA 0.1% lotion once a week. Another lesion remained unoccluded and the patient applied twice daily TACA 0.1% lotion at this test site.

Assessments

Before treatment and at weekly intervals the second investigator of each centre assessed the clinical severity scores of the lesions. Tolerability

 ISSN 0001-5555

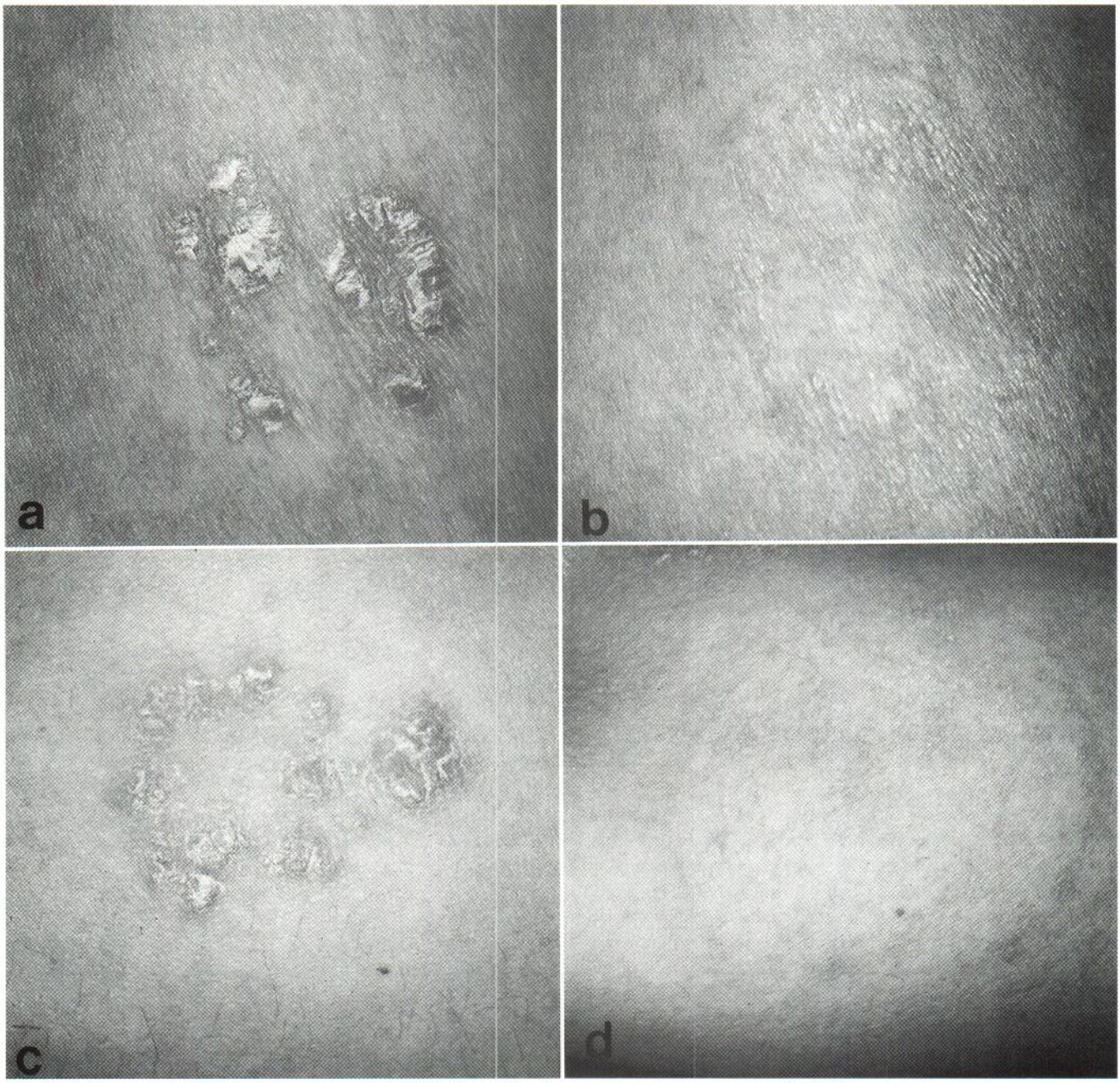

Fig. 1. Typical clinical response in one of the patients before (*a*) and after (*b*) treatment with Duoderm E and before (*c*) and after (*d*) treatment with Duoderm E + TACA.

and compliance of the treatments were assessed by the first investigator. As clinical severity scores erythema, induration and scaling were assessed using a 5-point scale, ranging from normal skin to pronounced involvement. Irritation was assessed using a 5-point scale, ranging from "no signs of itch, stinging, burning" to marked expression of these symptoms. The compliance of the treatments was studied, again using the 5-point scale, ranging from "comfortable to wear" to "uncomfortable to wear" and "stays on the skin" to "quick release from the skin".

Statistical analysis

For statistical analysis the Wilcoxon ranking test for paired data and the chi-squared tests were used.

RESULTS

In total, 40 patients were included and only one drop out occurred. Fig. 1 is a representative illustration of the clinical response of the patients to the four treatments. In 7 out of 40 patients the investigators observed signs of irritation: maceration, irritant dermatitis, folliculitis. One of these patients discontinued the treatment for this reason. In one subject irritation was observed at all three occluded test sites. In 3 subjects irritation was seen at the sites treated with Duoderm E as well as the sites treated with Duoderm E + TACA. The degree of irritation was similar comparing both sites in these patients. In 3 subjects

Table I. *Severity score (means) statistical analysis*

	Week	Erythema		Induration		Scaling	
		Score	*p* value*	Score	*p* value*	Score	*p* value*
Duoderm	0	2.31		2.36		2.15	
	1	1.95	<0.01	1.55	<0.001	1.02	<0.001
	2	1.74	<0.003	1.08	<0.001	0.92	<0.001
	3	1.70	<0.001	0.90	<0.001	0.72	<0.001
Duoderm + TACA	0	2.36		2.44		2.15	
	1	1.47	<0.001	1.30	<0.001	0.60	<0.001
	2	1.05	<0.001	0.92	<0.001	0.50	<0.001
	3	0.92	<0.001	0.50	<0.001	0.25	<0.001
TACA	0	2.29		2.51		2.24	
	1	1.97	<0.02	2.22		1.82	<0.03
	2	1.92	<0.01	2.18	<0.01	1.92	<0.04
	3	1.85	<0.005	1.97	<0.001	1.60	<0.001
Opsite + TACA	0	2.41		2.46		2.17	
	1	2.05	<0.003	2.27	NS	2.05	NS
	2	1.84	<0.001	2.29	NS	2.08	NS
	3	1.87	<0.001	2.17	<0.05	2.20	NS

* *p* value indicates statistical significance of difference of score during treatment compared to week 0.

irritation was seen exclusively at the test plaques treated with Opsite IV 3000. No statistically significant difference could be shown between Duoderm E and Opsite IV 3000 in this respect.

It can be seen that Duoderm E remained on the skin during all weekly treatment periods in 28 patients, whereas in 26 patients Opsite remained in situ during the whole experimental period. Of the 40 patients, 27 judged Duoderm E as "comfortable to wear" and 23 indicated Opsite IV 3000 as "comfortable to wear". With respect to compliance no statistically significant difference could be found between the two occlusive dressings. In one subject a dermatitis was observed at the Duoderm-treated sites. Epicutaneous tests with 9 compounds of the hydrocolloid revealed a 1+ (erythema) and 2+ (oedema/infiltration) response after 48 and 72 h with respect to pentalyn H.

Statistical evaluation is summarised in Table I. Erythema at test sites treated with Duoderm E reached a statistically significant reduction after only one week's treatment. The combination of Duoderm E + TACA resulted in a pronounced reduction of erythema. In contrast, at the Opsite + TACA-treated sites and TACA-treated sites only a tendency towards a reduction was observed, which was not statistically significant. Induration was reduced at the Duoderm E treated sites. However, the reduction induced in each individual patient by the combination of Duoderm E + TACA was more substantial. In contrast to the highly significant reduction at the Duoderm-treated sites, TACA resulted in a modest but significant reduction and the combination Opsite + TACA did not induce any improvement in this respect. Scaling was profoundly reduced at both Duoderm-treated sites, with a remarkable advantage at the Duoderm + TACA-treated sites. Scaling reduced but significantly at test sites treated with TACA only and no reduction of scaling was observed at the test plaques which had been treated with the combination of Opsite + TACA.

The total severity scores were calculated for the cohorts of 20 patients in both centres. Although the severity scores at the department in Arnhem tended to be slightly higher compared to the Nijmegen scores, a rather consistent pattern was observed. Opsite + TACA did not have a significant antipsoriatic effect, TACA only induced some improvement, Duoderm E was clearly effective and Duoderm E in combination with TACA proved to be a remarkably effective approach. The latter combination resulted in a total clearing of the plaques in 20% of the patients.

DISCUSSION

Occlusive dressings therapeutically influence the psoriatic epidermis. It has been shown by Fry that these dressings restore the granular layer and by Fisher et al. that occlusion decreases the mitotic activity of the epidermis (1, 11). Gottlieb et al. demonstrated that occlusion with HCD did not influence the immunopathologenesis of psoriasis, i.e. the presence of HLA DR^+ keratinocytes, dermal Langerhans' cells and activated T-lymphocytes (12). Elias et al. demonstrated inhibition of trauma-induced epidermal proliferation by occlusion with HCD (13). More recently van Vlijmen et al. demonstrated that markers for epidermal proliferation (nuclear binding to Ki-67) and differentiation (suprabasal expression of keratin 16) tended to diminish during HCD monotherapy of psoriatic plaques, whereas markers for inflammation (PAL-E and anti ICAM-1 binding) and accumulation of polymorphonuclear leucocytes and T-lymphocytes did not diminish (14).

As corticosteroids are potent inhibitors of cutaneous inflammation, it is attractive to speculate that HCD and corticosteroids have a synergistic antipsoriatic potential. In addition to such a synergistic effect it has been demonstrated that the blanching effect of corticosteroids is enhanced approximately threefold by HCD occlusion (15); the blanching-enhancing properties of HCD are slightly better compared to plastic occlusion (16, 17).

In this respect it is of importance that ultra potent corticosteroids such as clobetasol 17 propionate under HCD are as effective as TACA under HCD (9).

Lowe & David compared HCD + TACA and plastic occlusion + TACA with respect to the antipsoriatic efficacy and claimed an advantage for the former treatment (18). In this investigation the maximal application periods were 48 h.

Drawbacks to prolonged occlusion of the skin are maceration, irritant dermatitis and folliculitis. Indeed it has been demonstrated that following application of HCD and plastic occlusion bacterial content of the occluded skin increases markedly. However, this increase was more substantial at sites treated with plastic occlusion (19, 20).

The lack of efficacy of this formulation under Opsite IV 3000, however, is intriguing. The most likely explanation is that the semiocclusive properties of Opsite IV 3000 do not yield into a sufficient bioavailability of TACA.

In conclusion, HCD is superior to plastic semi-occlusion in occlusive corticosteroid therapy.

ACKNOWLEDGEMENTS

The authors wish to acknowledge Dr. R. White, ConvaTec U.K. and Mr. B. Willemsteijn of ConvaTec, The Netherlands, for helpful discussion and financial support and Charlotte Neger for secretarial assistance.

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