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Dithranol short-contact treatment of scalp psoriasis

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BACKGROUND: Scalp psoriasis is often rather therapy-resistant and very patient-impairing. There are not many alternative treatments when descaling ointments and corticosteroids fail. Dithranol short-contact therapy is a very effective treatment for psoriatic lesions on the body, but little is known about its usefulness for the treatment of scalp psoriasis. OBJECTIVE: We studied the efficacy and side-effects of dithranol short-contact treatment of scalp psoriasis. METHODS: Included in the study were 13 patients with moderate to severe therapy-resistant psoriasis of the scalp. We used the Psoriasis Area and Severity Index (PASI) to assess the clinical efficacy. All reported side-effects were registered. The treatment was evaluated by the patients by means of a multiple choice questionnaire. RESULTS: Of the 13 patients, 12 completed the treatment. Six showed good results (clearance >80%), two showed moderate results (clearance 40–80%) and four showed bad results (clearance <40%). The mean clearance after treatment was 58% and after 3 months of follow-up it was still 55.8%. Nine different side-effects were reported, but none resulted in interruption of treatment for more than 2 days. It can be concluded that dithranol short-contact therapy is worth trying as an alternative in the treatment of scalp psoriasis in a selected group of patients in whom descaling ointments and topical corticosteroids are not effective. (*J Dermatol Treat* (1999) 10:13–17)

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Introduction

Psoriasis of the scalp can be particularly difficult to treat. Steroid applications share the relative contraindications of long-term topical corticosteroid use (local as well as systemic side-effects), and pomades containing tar are cosmetically less acceptable.[1] Not all patients react satisfactorily to these agents. There exists a need for an alternative treatment of scalp psoriasis. As dithranol has been shown to be a very effective and safe therapeutic agent in the treatment of psoriasis,[2] it might be a good alternative in the treatment of psoriasis of the scalp. There are a few studies in which the efficacy, side-effects and practical problems of the treatment of scalp psoriasis with dithranol have been investigated.[3-5] Dithranol treatment has been suggested as a possibility, but dermatologists apparently are not convinced of the applicability of the treatment.[6-9] The aim of this open study was to evaluate the efficacy, side-effects and applicability of dithranol short-contact treatment as an alternative for relatively therapy-resistant scalp psoriasis.

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Patients and methods

The patients had to be willing to spend 1 h every day undergoing treatment while understanding the risk of side-effects. They had to have visible psoriasis lesions with a minimum area of 10% of the scalp, which had not reacted satisfactorily to treatment with tar shampoo, descaling products and/or corticosteroids. Systemic treatment in the last 3 months and pregnancy were exclusion criteria. All therapies used on the scalp

had to be stopped 2 weeks prior to the start of dithranol treatment.

Treatment regimen

The patients were treated daily with dithranol cream in a short-contact treatment schedule.[10-13] We used a dithranol cream prepared by the Department of Clinical Pharmacy of our hospital. The formulation (Table I) and preparation were based on the recommendations of Ros and Van der Meer.[14] This cream has a well-established stability of 1 year and during 6 years of usage in our day-care centre we have acquired good clinical experience with it.[15] Creams with a dithranol concentration below 0.6% are stored at 4°C, and those with a dithranol concentration of 0.6% or higher are stored at room temperature. The following concentrations were used: 0.1%, 0.2%, 0.3%, 0.4%, 0.6%, 0.8%, 1.0%, 2.0%, 3.0% and 5.0%. During the first week of treatment the patients visited our outpatient clinic three times in order to receive treatment instruction. A videotape with instructions about how to apply a cream to the scalp was available. During the second and third week the patients visited the outpatient clinic twice, and after the third week they came once a week. Patients were instructed to use salicylic acid 10% in axunge overnight, at least for three nights before starting the treatment in order to reach an optimal desquamation to achieve better penetration of the working agent. To protect the surrounding skin, especially ears, forehead and neck, white petrolatum was used. During treatment we advised the use of baby oil on the scalp overnight to prevent the head from drying which would lead to scaling and pruritus.

The starting concentration and application time of the dithranol cream were 0.1% for 45 min for 3 days. Every 3 days the dithranol concentration was increased. The dithranol cream was washed out easily with water only, followed by washing with a mild shampoo. When irritation on the treated skin occurred, patients were advised to pass over one day and then start again with a lower concentration and the same application time of 45 min. When side-effects were mainly localized to noninvolved skin, we gave the patient further instructions to prevent these. During the follow-up period of 3 months the patients visited the outpatient clinic once a month and were allowed to use tar shampoo and/or a class III corticosteroid emulsion on the remaining or recurring lesions.

Assessments

Clinical assessment of the severity of the scalp psoriasis was done before treatment, followed by once a week, and 1, 2 and 3 months after treatment, using a modified Psoriasis Area and Severity Index (PASI).

Dithranol	*x* g
Cetiol V® (decyl oleate)	200+*x* g
Cetomacrogol emulsifying wax	150 g
Liquid paraffin	150 g
Salicylic acid	10 g
Sorbic acid	1.5 g
Ascorbic acid	0.5 g
Purified water	to 1000 g

Table I
Formulation of the dithranol cream used. The quantity of dithranol per 1000 g of cream can vary from 500 mg to 50 g (concentrations 0.05% to 5%)

This so-called head-PASI was derived using the following formula:

$$\text{Head-PASI} = (\text{erythema score} + \text{induration score} + \text{scaling score}) \times \text{area score}$$

Erythema, induration and scaling were scored on a four-point scale and area on a six-point scale, as in the original PASI.[16,17] In order to score the activity of the psoriasis in general, overall body lesions were scored every 2 weeks and at every follow-up visit. In the weekly assessments all side-effects reported by the patients were registered. A particular side-effect was only registered once, although the patient could have reported this side-effect many times. Pruritus on the scalp was assessed on a ten-point scale, 0 representing no itch and 10 representing intolerable itch. It was only registered as being a side-effect if it became more intense during the treatment. To be able to compare the colour of the hair before and after treatment, photographs were taken. In order to gain information about the patients' perception of the treatment, a multiple-choice questionnaire with questions regarding effectiveness, side-effects, practical performance and overall appreciation was developed.

Results

Included in the study were 13 patients (4 men, 9 women) with moderate to severe psoriasis of the scalp. All patients provided written informed consent. The mean age was 47 years (range 23 to 75 years). Management before participation in this study varied from no treatment (because nothing helped) to tar shampoo only and/or a class II, III or IV corticosteroid lotion/emulsion.

Of the 13 patients included, 12 completed the treatment. All patients had therapy-resistant difficult-to-treat scalp psoriasis, with a mean involved area of the head of 25.8% (i.e. about 50% of the scalp). The mean results of the assessments are shown in Table II. The improvement in head-PASI (clearance) is expressed

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Table II
Head-PASI before and after treatment (means), clearance and duration of treatment for the three groups of patients and overall

Patient group	Head-PASI		Clearance (%)	Treatment duration (weeks)
	Before treatment	After treatment		
I ($n=6$)	14.8	1.3	91.8	7.1
II ($n=2$)	16	8	50	8
III ($n=4$)	11.3	11.5	-1.8	7
Overall	13.8	5.8	58	7.3

as a percentage. Overall the clinical effects in the patients could be divided into three groups: group I with good results (clearance >80%), group II with moderate results (clearance 40–80%) and group III with bad results (clearance <40%). At the end of treatment the head-PASI was significantly decreased, with a mean clearance of 58%. There was no change in the activity of the psoriasis on the body of the patients. The patient who did not complete the treatment stopped after 2 weeks because she found it too time-consuming to perform without help from others and her hair was difficult to style. She was included only in the analysis of side-effects. We allowed patients to increase the application time from 45 to 60 min. The final concentration and application time varied from 2% for 45 min ($n=1$) to 7% for 60 min ($n=2$). Most patients ended with a concentration of 3% for 45 or 60 min ($n=5$).

Nine different side-effects were reported (Table III), with an average of three side-effects per patient, ranging from two to five. None of these side-effects resulted in interruption of the treatment for more than 2 days. There was no significant relationship between concentration and appearance of side-effects, although there was a peak of prevalence of new side-effects at a dithranol concentration of 1%.

The multiple-choice questionnaire was filled in at the end by all 12 patients who completed the treatment. Most ($n=7$) needed help to treat their head. The mean time per day to carry out the treatment was 53 min, varying from 20 to 180 min. Some patients carried out their (household) work during the 45 or 60 min the cream stayed on their scalp. They only counted the time actually lost in applying and washing out the cream. Besides the results in Table IV patients were asked about staining of materials (bathroom equipment, clothes, towels, etc.), which was reported by nine patients (75%). This staining was experienced as no problem at all by four patients and as a slight problem by five. In the case of a relapse within a few months, six patients would certainly perform this treatment again, one patient would perhaps try it again and five patients did not want to undergo the treatment again. The reasons for not choosing this treatment again were: no/little effect ($n=4$), staining of materials ($n=2$), irritation of the eyes ($n=1$) and irritation of the skin ($n=1$).

After 3 months of follow-up the mean improvement in the head-PASI was 55.8%. Three patients in group I had an improvement of 100% and one patient an improvement of 75% compared to the head-PASI before starting therapy. The other two patients from group I showed a significant deterioration of their psoriasis, still they had a slight improvement of the head-PASI (10% and 33% respectively) compared to the score before treatment. In group II and III two patients showed a deterioation of the head-PASI compared to the score before treatment. The other four patients showed an improvement in their head-PASI of 60, 67, 75 and 100%, compared to the score before therapy.

Side-effect	No. of patients
Irritation of noninvolved skin	9
Burning/stinging of the scalp	8
Keratoconjunctivitis	6
Pruritus of the body	5
Pruritus of the scalp	3
Pustules	2
Staining of hair	2
Hair difficult to style	2
Dermatitis of hands	1

Table III
Reported side-effects

Discussion

There appeared to be a large interindividual difference in clinical response. Comparison of our study with other studies in which dithranol was used on the scalp[3-5] is impossible as other preparations and different dithranol concentrations were used, treatment

	Much/very much (no. of patients)	Little/no (no. of patients)
Efficacy	8	4
Irritation of the scalp	2	10
Irritation of noninvolved skin	5	7
Irritation of the eyes	4	8
Treatment time	4	8
Overall satisfaction	9	3

Table IV
Subjective experiences of patients (n = 12) after treatment

schemes differed and the definition of psoriasis severity and clearance were different or lacking. The side-effects we observed were all known side-effects of dithranol treatment, except for the generalized pruritus observed in five patients. A possible explanation for the generalized pruritus could be the higher frequency of taking showers resulting in dryness and itching of the skin and in dithranol contact with the skin of the rest of the body from dithranol running down from the head. However, this explanation can be rejected by the fact that patients who washed their hair over a wash-basin also suffered from pruritus on their body. Another possibility is that the pruritus was caused by systemic changes induced by this local treatment. Goodfield et al[18] investigated the systemic effects of dithranol treatment in psoriasis. They concluded that dithranol does not significantly accumulate in the blood or other tissues but that the treatment probably induces changes in circulating factors as yet unknown. Perhaps one of these factors plays a role in the mechanism of pruritus. A fact supporting this hypothesis is that the scalp is richly vascularized, resulting in a greater permeability to and absorption of medications.[6,8]

Patients should be warned of the possibility of discoloration of the hair before starting the therapy. The two patients who showed distinct discoloration of their hair at the end of the study had grey hair and dyed blond hair, respectively. The grey hair turned purple, and the blond hair coloured reddish. Four other patients also observed a slight discoloration of their hair, which was mostly apparent as a reddish glow, but this could not be confirmed objectively by comparing the photographs taken before and after treatment. The patients with hair discoloration all had (dyed) blond or grey hair; none of them thought the discoloration was a problem. Two patients reported that their hair was difficult to style, which is explained by the use of a creamy preparation which may, in the same manner as a cream shampoo, result in the hair becoming lank.

Psoriasis of the scalp often reaches beyond the hairline. Dithranol discoloration of the skin especially of the face could be a problem for some patients. We probably did not notice any discoloration because white petrolatum was used to protect the surrounding skin. Still patients should be warned that discoloration can occur. When it does occur, it will disappear within 1–2 weeks after interruption of the therapy. In cases of postinflammatory hypo- or hyperpigmentation at sites of healed psoriatic plaques, the skin will take longer (up to several months) to return to the same colour as the surrounding skin.[11] However, these pigmentary changes are far less striking than the appearance of the psoriatic plaques, and our experience in the day-care centre is that in most patients treated with dithranol cream for psoriasis of the face, discoloration does not occur or when it does it is no problem.

Despite the great number of side-effects reported, the subjective patient findings are positive. More information about the clinical response of the psoriasis can be obtained by looking at the tendencies for improvement. In five patients a clearance of 50% or more was seen in the first 2 weeks of treatment. After this rapid improvement, two patients experienced a further improvement, one stayed at the same level and two showed a slight increase in the head-PASI (the original level was not reached). In these latter three patients the prolongation of the treatment seemed to have no or an adverse effect. The same tendency was observed in two patients who, after showing an initial improvement in the head-PASI after 4 weeks of treatment, showed only a slow decrease in the score during the final 4 weeks of treatment. The initial improvement could have been caused primarily by descaling alone, but improvements in the induration and erythema scores of the head-PASI were also observed. Another hypothesis is that these patients did respond positively to the dithranol, but the concentrations were increased too rapidly, so either the skin became irritated or the effective dithranol concentration was reached and passed too quickly.

It is hard to distinguish between erythema and scaling of the scalp caused by irritation and that caused by the psoriasis. This might explain the improvement in the scalp psoriasis during follow-up in six patients. This was also confirmed by the findings in two patients in whom treatment was stopped after 6 weeks because the psoriasis showed a tendency to worsen. After they stopped treatment, the head-PASI showed a marked improvement over 2 weeks. During follow-up one patient used corticosteroid emulsion for 4 days a week and the other patient used only tar shampoo once a week. Their psoriasis stayed calm and a clearance of 67% and 100%, respectively, was seen after 3 months. Most probably the dithranol treatment induced an irritant contact dermatitis, which disappeared after interruption of the treatment. To prevent a too-rapid increase in concentration we allowed patients to increase the application time or to apply the same concentration for the same application time for a longer period (up to 10 days, as long as a therapeutic effect was still observed) before going to a higher dithranol concentration. Three patients experienced the greatest improvement during the fourth week, using concentrations of 0.8% or 1%. It can be concluded that at least these concentrations have to be reached to distinguish between no response at all or a response at a higher dithranol concentration.

The use of a dithranol concentration higher than 5% was first rejected because concentrations beyond 3–5% to treat psoriasis on the body may not further improve the therapeutic effect.[19] Because not much is

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known about treatment of scalp psoriasis with dithranol at higher concentrations, we allowed two patients, who had shown a good response to concentrations up to 5%, to use a dithranol concentration of 7%, but this did not further improve the therapeutic effect. Dithranol short-contact treatment of the scalp is a rather time-consuming therapy which has to be performed by motivated and well-informed patients with the support of a motivating doctor in order to succeed. Bearing in mind that we treated selected patients with rather therapy-resistant psoriasis of the scalp, dithranol short-contact therapy certainly appears to be an alternative treatment worth trying in those patients in whom other treatments have failed.

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