Acta Dermatovenerol Croat 2007;15(1):15-19 SHORT SCIENTIFIC COMMUNICATION

Naphthalene in the Treatment of Patients with Atopic Dermatitis

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SUMMARY Atopic dermatitis is a chronic relapsing inflammatory skin disease the incidence of which has been constantly growing in all age groups. Research into the use of naphthalene in the treatment of patients with psoriasis proved its anti-inflammatory and antiproliferative effects as well as a satisfactory remission for months in more than 70% of treated patients with psoriasis. The present study was undertaken to investigate the efficacy of naphthalene in the treatment of patients with atopic dermatitis. According to study results, naphthalene therapy proved efficacious and free from side effects in 20 atopic dermatitis patients.

KEY WORDS: naphthalene preparation, naphtha oil, hydrocarbon complex, sterans, polyaromatics, naphthalene therapy

INTRODUCTION

Naphthalene therapy for atopic dermatitis (AD) was assessed at Naftalan Special Hospital for Medical Rehabilitation in Ivanić Grad. Naphthalene is natural earth mineral oil, a dense, dark-brown liquid with a high specific weight (0.93-0.98 at 15 °C). As heavy oil, it is found in surface earth layers (100-700 m) (1-5). Naphthalene consists of a small quantity of light fractions (petrol, ligroin, kerosene) and paraffin, and a high percentage of polycyclic naphthol hydrocarbons (cyclopentanoperhydrophenantrene) structures. Sterans are most significant as carriers of the naphthalene medicinal properties. Sterans have a chemical structure similar to hormones and vitamins. The size of its molecule is 200-450 Da, which makes possible for the molecule to pass through the healthy (500 Da) and diseased (700 Da) skin (2,5-8). Naphthalene as a natural medicinal product with proven efficacy and antiproliferative properties in psoriasis (3,4-8), and as an antiangiogenic factor in psoriatic lesions (9). A new naphthalene preparation, naphthalene AA-final (Ivalan®), enriched with sterans, constituents believed to represent active naphthalene components, while the content of polyaromatics has been substantially reduced, is currently available at Naftalan Special Hospital for the management

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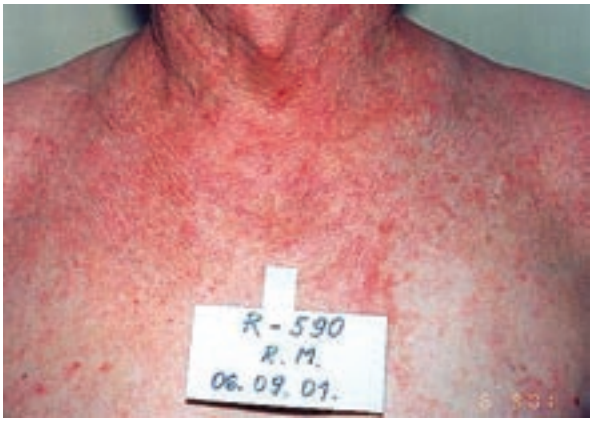

Figure 1. Atopic dermatitis in patient R. M. before naphthalene therapy.

of psoriasis (10). Naphthalene therapy as one of newest topical AD treatments was assessed in the present study.

MATERIAL AND METHODS

The study included 20 AD patients (9 male and 11 female), aged 15-65, most of them in the 15-25 age group. Study patients presented various clinical pictures of AD. Clinical evaluation according to SCORAD index (11) and photographing were done before and after therapy. Biochemistry laboratory testing including complete blood count (CBC), erythrocyte sedimentation rate (ESR), blood glucose (BG), aminotransferases, alkaline phosphatase (AP), albumin, bilirubin, creatinine, cholesterol, triglycerides (TG), blood urea nitrogen (BUN) and serum electrolytes, urinalysis and histologic evaluation were performed before and after 3 weeks of therapy. Total serum IgE levels were quantitatively determined using the CAP system techniques.

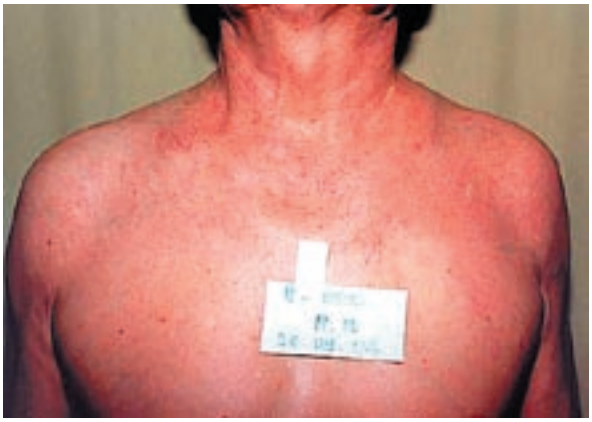

Figure 2. Atopic dermatitis in patient R. M. after 3-week naphthalene therapy.

Naphthalene therapy was administered according to the usual protocol, applied for some 15 years in the treatment of patients with psoriasis and rheumatic diseases at Naftalan Special Hospital for Medical Rehabilitation in Ivanić Grad, Croatia. Naphthalene therapy was applied once daily with warm baths for 12-14 minutes in tubs with naphthalene oil, at a temperature of 34-38 °C, for 3 weeks. After bath, neutral creams (Eucerin intensive cream or Belobaza cream and Eucerin cream shower oil) were applied. An oral antihistaminic (diphenhydramine, Dimidril, 3x1 tbl) was used occasionally.

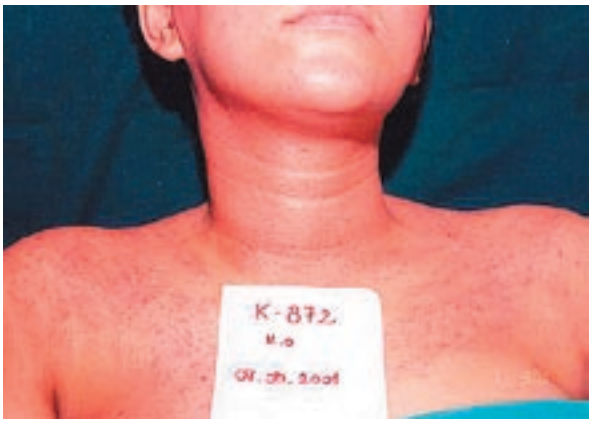

Figure 3. Atopic dermatitis in patient K. O. before naphthalene therapy.

RESULTS

Clinical evaluation after 3 weeks of naphthalene therapy revealed improvement of clinical assessment in all cases (Figs. 1-6), along with a reduction of itching and sleeping disturbance. The mean SCORAD index was 75.4 before and 30.9 after naphthalene therapy. Graphic records of SCORAD index are shown in Fig. 7.

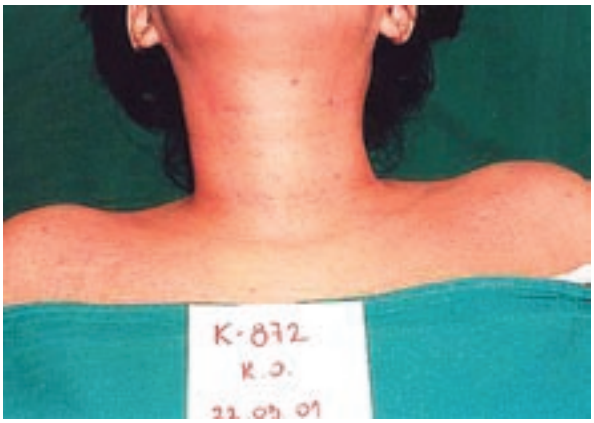

Figure 4. Atopic dermatitis in patient K. O. after 3-week naphthalene therapy.

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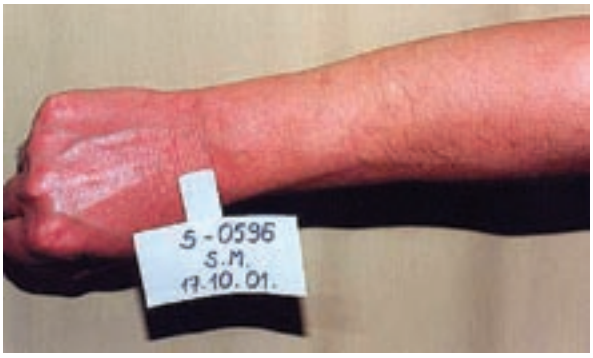


Figure 5. Atopic dermatitis in patient S. M. before naphthalene therapy.

Histological evaluation

Probatory excisions were done in all 20 patients before and after 3-week naphthalene therapy. In 11 patients, AD could not be identified on control histology findings, whereas in nine patients control histology findings showed acanthosis (epidermis

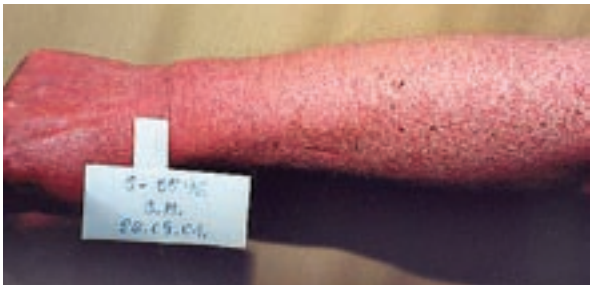


Figure 6. Atopic dermatitis in patient S. M. after 3-week naphthalene therapy.

widening) to be the same or reduced. Subepidermal perivascular infiltrate of lymphocytes and fibrohistiocytes was reduced or highly reduced (Figs. 8a, 9a). Reduction of inflammatory infiltration was observed in all 20 patients (Figs. 8b-10b).

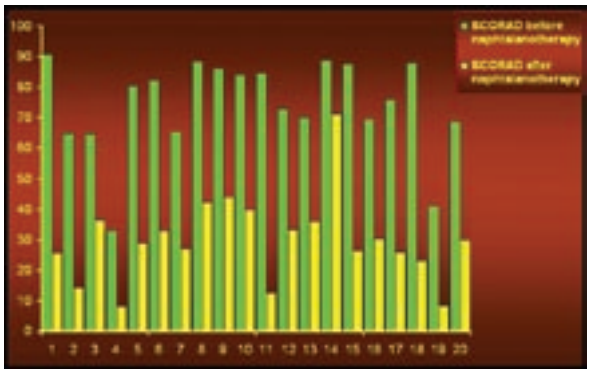


Figure 7. Graphic record of SCORAD index in 20 atopic dermatitis patients before and after naphthalene therapy.

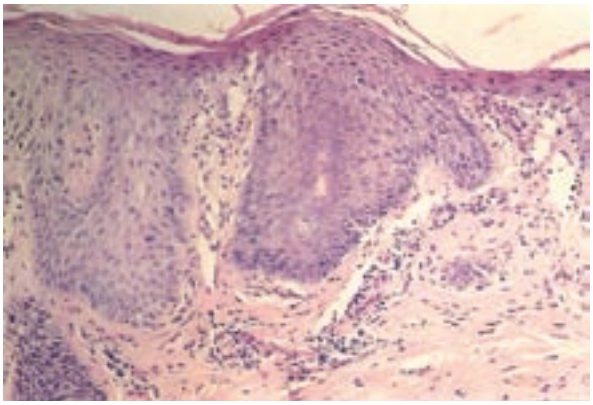
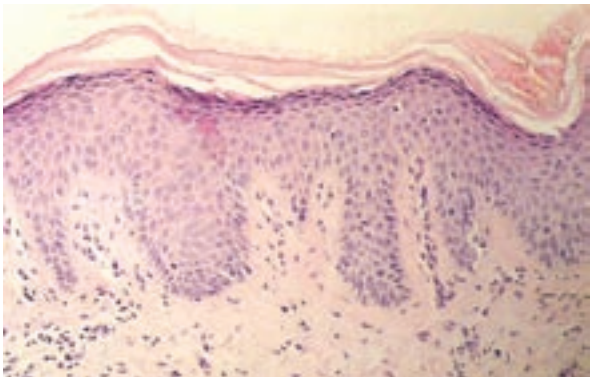


Figure 8. (a) Patient R. M. before naphthalene therapy: parakeratosis, acanthosis and inflammatory infiltration in the subepidermal dermis (HE; X220); **(b)** patient R. M. after 3-week naphthalene therapy: acanthosis and reduction of the inflammatory infiltration (HE; X220).



IgE evaluation

Total IgE level was higher after than before naphthalene therapy in only four, unchanged in six and reduced in ten of 20 AD patients (Table 1).

Biochemistry laboratory parameters

In all 20 patients, the values of CBC, ESR, BG, aminotransferases, AP, albumin, bilirubin, creatinine, BUN, serum electrolytes, calcium, cholesterol, TG and urinalysis determined before and after 3-week naphthalene therapy were within the normal range. The naphthalene mineral earth oil caused no hematotoxicity, hepatotoxicity or nephrotoxicity in AD patients.

DISCUSSION

In all 20 patients, clinical improvement in terms of reduction or disappearance of pruritus and sleep disturbance, reduction of skin lesions and reduction of SCORAD index (changes in total intensity,

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Table 1. Total IgE results before and after naphthalene therapy in 20 atopic dermatitis patients

Patient No.	Total IgE	
	Before naphthalene therapy	After naphthalene therapy
1	37 k IU/L (122)	70 k IU/Ll (122)
2	1117 IU/mL (120)	552.6 IU/mL (120)
3	144 IU/mL	130 IU/mL
4	85 IU/mL	85 IU/mL
5	88 k IU/L	88 k IU/L
6	822 IU/mL	719 IU/mL
7	1329.2 k IU/L	1220 k IU/L
8	81 k IU/Ll	81 k IU/L
9	159 IU/mL	140 IU/mL
10	130 IU/mL	130 IU/mL
11	144.1 IU/mL	144.1 IU/mL
12	619 IU/mL	2000 k IU/L
13	210.3 IU/mL	234.6 IU/mL
14	27.1 IU/mL	27.1 IU/mL
15	3275 IU/mL	2877 IU/mL
16	2240.60 k IU/L	2175.40 k IU/L
17	2409.0 k IU/L	2009.0 k IU/L
18	3898 k IU/L	4000 k IU/L
19	4000 k IU/L	2400 k IU/L
20	1888.0 k IU/L	1105.0 k IU/L

i.e. erythema, edema, excoriation, lichenification and crusts) was recorded (11). Tolerability was good and free from side effects or alterations in hematology and biochemistry parameters. In our 20 patients, remission lasted for a mean of 20.4 months. Naphthalene proved to be a good therapeutic option in AD patients with a 70% efficacy. Considering that naphthalene is a non-steroidal therapy, we can recommend it in the treatment

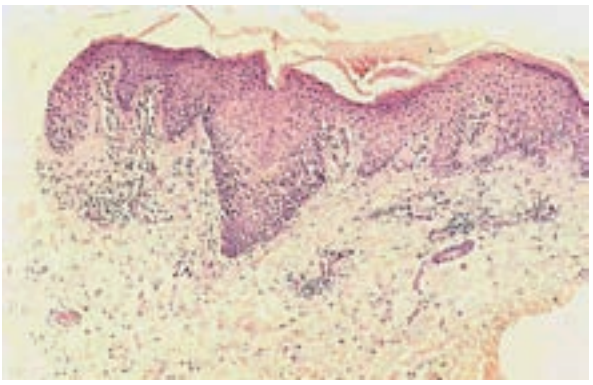
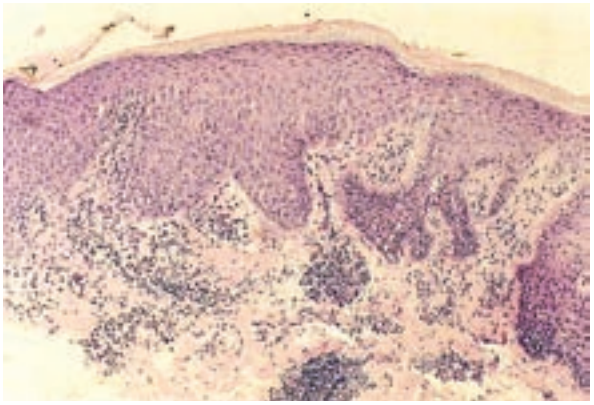
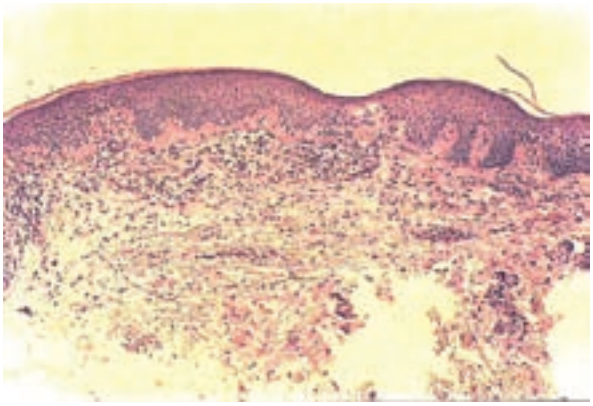


Figure 9. (a) Patient K. O. before naphthalene therapy: acanthosis and inflammatory infiltration in the upper part of the dermis (HE; X220); **(b)** patient K. O. after naphthalene therapy: acanthosis and reduction of the inflammatory infiltration (HE; X220).



of AD in both adults and children. Naphthalene therapy is one of therapeutic options for AD and is harmless for health in general. No unwanted effects that would require discontinuation of naphthalene therapy were recorded. Naphthalene therapy offers a new therapeutic approach in the management of AD.



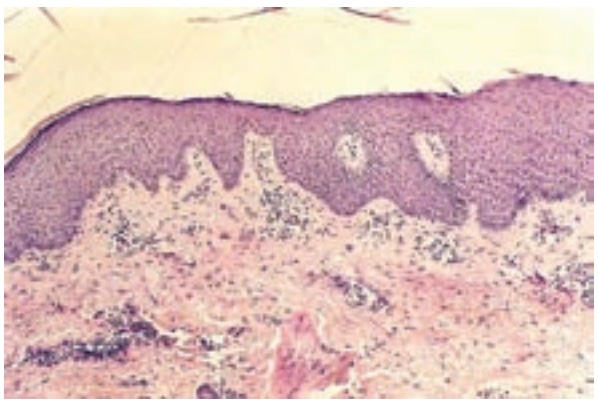


Figure 10. (a) patient S. M. before naphthalene therapy: subepidermal inflammatory infiltration (HE; X180); **(b)** patient S. M. after naphthalene therapy: reduction of the inflammatory infiltration (HE; X220).

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Radeiner, mineral water; year 1937.
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