

## Outcome of "Short-term" Dead Sea Climatotherapy for Psoriasis

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Sir,

Climatotherapy at the Dead Sea (CDS) for patients with psoriasis induces a persistent remission in the majority of patients with psoriasis, is associated with minor side-effects and is pleasant for the patients (1–11).

The published literature on CDS describes patients with moderate to severe psoriasis who spend an average period of one month ("long-term") at the Dead Sea. There are no published data, however, on the effectiveness and characteristics of "short-term" CDS for patients with psoriasis, who spend only 2 weeks at the Dead Sea.

The instruments used previously for assessment of response to CDS in psoriasis patients were not standardized. In the last 10 years, the use of a 75% or 50% decrease in Psoriasis Area and Severity Index (PASI75 and PASI50, respectively; 12, 13) has become the gold standard in evaluating the efficiency of psoriasis treatment. In a literature review, we found no publications that used the PASI75 or PASI50 instruments to assess the response to CDS in patients with psoriasis. In a previous study we have shown the utility of the Beer Sheva Psoriasis Severity Score (BPSS) to assess psoriasis severity and response to treatment (14).

The objective of the current study was to assess the effectiveness of CDS in a series of patients with psoriasis treated for a "short-term" period of 2 weeks, using BPSS and PASI, with particular emphasis on PASI75 and PASI50 end-points.

### METHODS

The study was conducted in the southern district of Clalit Health Services, the largest organization of managed care in Israel. In the southern district of Israel, Clalit Health Services serves a population of approximately 470,000 enrollees.

The study group comprised patients with psoriasis vulgaris who received CDS between March 23, 2003 and April 20, 2006. All patients were advised to stop any topical treatment (except emollients) before commencing CDS treatment. A wash-out period of 2–4 weeks of systemic anti-psoriatic drugs was advised before CDS.

Treatment was carried out in the Ein Bokek area, on the shores of the Dead Sea. The treatment protocol for psoriasis at the Dead Sea included sunlight exposure and bathing in Dead Sea water.

The treatment protocol included gradual exposure to the sun for a duration that depended on the skin type, season of the year and time of day. In most cases, sunlight exposure started at 15 min daily and was gradually increased to a maximum of 3 h daily, divided into morning and afternoon sessions. The required time for sun acclimatization was 5 days for skin types III and IV and 6 days for skin type II. Bathing in Dead Sea water for 15

min twice a day was performed before sun exposure. Patients used emollients, such as Vaseline, baby oils and moisturizing creams, freely before and after treatment. The patients were allowed to use salicylic acid (2–5%) ointment.

Clinical assessment of psoriasis severity was performed at baseline and at the end of the treatment period. The severity of psoriasis was measured using the PASI (1). The PASI ranges from 0 to 72. In the current study, response to treatment using the PASI was defined according to the rate of improvement in PASI, as follows: good 75–100%; moderate 50–74%; slight 25–49%; and none, less than 25%.

In addition to the PASI, we used the BPSS. This is a novel tool for the ambulatory assessment of patients with psoriasis, which we have described previously (14). BPSS has 16 items, of which 8 are recorded by the physician and 8 by the patient, using linear 4–10-point visual analogue scales. All scores are summed directly, except for the 7 items of distribution of the disease assessed by the physician (which have 4-point scales, and are multiplied by 2.5). BPSS ranges from 0 to 160. In our previous study, we have shown the utility of the BPSS to assess psoriasis severity and response to treatment (14).

The results of continuous variables are shown as means±SD. Paired *t*-tests were used to analyse statistically significant differences in continuous parameters before and after treatment. Dichotomous variables were analysed using  $\chi^2$  tests. Logistic regression was used for multivariate analyses. *p*-values  $\leq 0.05$  were considered statistically significant.

### RESULTS

A total of 85 adult patients with psoriasis vulgaris were treated by CDS (47 men, 38 women; mean age 52.5 years, range 22–80 years). There was a positive family history of psoriasis in 28.9% of the patients.

The majority of patients were treated between May and July (55/85 patients, 64.7%). Fourteen patients (16.5%) had less than 3 h a day of sun exposure and 32 patients (37.6%) bathed in the Dead Sea for less than 30 min daily. The mean length of treatment was 14.5 days (standard deviation (SD) 3.9 days) with 57/82 of the patients (69.5%) staying between 12 and 14 days.

There was a 70.9% reduction in PASI, from a mean of 17.5±11.0 before treatment to 4.4±4.6 after treatment ( $p < 0.001$ ). PASI75 was observed in 43/78 patients (55.1%) and PASI50 was observed in 66/78 patients (84.6%).

There was a 50.7% reduction in BPSS, from a mean of 72.1±20.3 before treatment to 35.3±21.3 after treatment ( $p < 0.001$ ). BPSS75 was observed in 17/84 patients (20.2%) and BPSS50 was observed in 44/84 patients (52.4%).

The mean PASI reduction was 77.7% (SD 24.2) in women and 65.2% (SD 31.1) in men ( $p$ -value 0.052). The

mean BPSS reduction was 53.9% (SD 28.9) in women and 48.1% (SD 23.7) in men (n.s.). Age did not have a significant effect on PASI or BPSS (data not shown). The reduction in PASI and BPSS, stratified according to sun exposure and Dead Sea bathing, is shown in Table I.

A logistic regression model demonstrated that sun exposure of more than 3 h/day (OR 8.9, 95% confidence interval (CI) 1.5–53.8) and female gender (OR 5.5, 95% CI 0.9–31.6) were significantly associated with PASI50. The length of immersion in Dead Sea water did not have an effect on PASI50.

## DISCUSSION

This is the first study to describe the characteristics of “short-term” CDS in patients with psoriasis. The main finding is that only 55% of the patients achieved PASI75, which is in contrast to previous studies on long-term CDS, reporting an almost complete remission after CDS in the majority of the patients (1, 9). For example, in a study conducted by Even-Paz et al. (15), the improvement rate was 87% in patients treated by long-term CDS. The mean length of CDS reported in our study was 14.5 days, with more than two-thirds of patients staying between 12–14 days, compared with an average of one month in previously published studies. In our opinion, the main reason for the observed low response rate to CDS in our study relies on the short length of stay at the Dead Sea.

Previous studies investigated which factor is responsible for the beneficial effect of CDS in patients with psoriasis (4). Exposure to sunlight and Dead Sea water bathing are considered to be most important. In a study by Even-Paz et al. (15), it was observed that the major therapeutic factor is exposure to sunlight, whereas Dead Sea water only enhances the effect of the sun. In the current study, a multivariate analysis demonstrated that an average sun exposure of more than 3 h per day is independently associated with improved outcome; further

demonstrating that exposure to Dead Sea sunlight has the main effect on the response rate to CDS.

The recommendations for CDS consist of sunlight exposure at a maximum of 3 h daily in the spring and summer, divided into morning and afternoon sessions (4). In our study, we observed that 83.5% of patients reported sun exposure of more than 3 h per day. As CDS is a phototherapy with known risks for sun damage, we recommend that patients should not be exposed to sunlight for longer than the recommended therapeutic guidelines. As almost two-thirds of Israeli patients perform CDS during a period of 3 months (May–July), we recommend that public health decision-makers and Health Maintenance Organization managers in Israel should organize a public dermatology consultation at the Dead Sea area for patients with psoriasis undergoing CDS, at least during the spring period.

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Table I. Percentage of patients (n=85) who achieve 75% and 50% reduction in PASI and BPSS, stratified according to length of sun exposure and Dead Sea bathing

	PASI75	PASI50	BPSS75	BPSS50
<i>Daily sun exposure (h)</i>				
<3	54.5	63.6	30.8	53.8
4–6	57.4	88.9	21.4	53.6
>6	46.2	84.6	7.1	50.0
Total	55.1	84.6	20.2	52.4
<i>Daily Dead Sea water bathing</i>				
None	50.0	100.0	66.7	100.0
<30 min	51.7	75.9	24.1	62.1
30–60 min	63.3	90.0	15.2	39.4
1–2 h	50.0	87.5	11.8	47.1
>2 h	0.0	100.0	50.0	100.0
Total	55.1	84.6	20.2	52.4

PASI: Psoriasis Area and Severity Index; BPSS: Beer Shera Psoriasis Severity Score.