Balneotherapy at the Dead Sea Area for Patients with Psoriatic Arthritis and Concomitant Fibromyalgia

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Abstract

Background: Balneotherapy has been successfully used to treat various rheumatic diseases, but has only recently been evaluated for the treatment of fibromyalgia. Since no effective treatment exists for this common rheumatic disease, complementary methods of treatment have been attempted.

Objectives: To assess the effectiveness of balneotherapy at the Dead Sea area in the treatment of patients suffering from both fibromyalgia and psoriatic arthritis.

Methods: Twenty-eight patients with psoriatic arthritis and fibromyalgia were treated with various modalities of balneotherapy at the Dead Sea area. Clinical indices assessed were duration of morning stiffness, number of active joints, a point count of 18 fibrositic tender points, and determination of the threshold of tenderness in nine fibrositic and in four control points using a dolorimeter.

Results: The number of active joints was reduced from 18.4 ± 10.9 to 9 ± 8.2 ($P < 0.001$). The number of tender points was reduced from 12.6 ± 2 to 7.1 ± 5 in men ($P < 0.003$) and from 13.1 ± 2 to 7.5 ± 3.7 in women ($P < 0.001$). A significant improvement was found in dolorimetric threshold readings after the treatment period in women ($P < 0.001$). No correlation was observed between the reduction in the number of active joints and the reduction in the number of tender points in the same patients ($r = 0.2$).

Conclusions: Balneotherapy at the Dead Sea area appears to produce a statistically significant substantial improvement in the number of active joints and tender points in both male and female patients with fibromyalgia and psoriatic arthritis. Further research is needed to elucidate the distinction between the benefits of staying at the Dead Sea area without balneotherapy and the effects of balneotherapy in the study population.

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The role of balneotherapy in the treatment of various inflammatory and non-inflammatory arthritides is a subject of much debate. In Israel, the major health resort area is located along the western shore of the Dead Sea. Previous studies have shown that bathing in hot sulphur baths, applying mudpacks, or a combination of both, can induce a significant improvement in patients suffering from rheumatoid arthritis [1–3]. Home use of Dead Sea bath salts by patients with rheumatoid arthritis has also been found effective in reducing both objective and subjective parameters of rheumatoid arthritis activity for a period lasting up to one month [4].

We recently studied the effectiveness of balneotherapy in patients with primary fibromyalgia [5,6]. Forty-eight patients with fibromyalgia were randomly assigned to a treatment group receiving sulphur baths, and to a control group. Physical function and tenderness improved in both groups, but was particularly notable in the treatment group and persisted for at least 3 months [6]. Furthermore, in both groups there was relief in the severity of fibromyalgia-related symptoms (pain, fatigue, stiffness and anxiety), and a reduction in the frequency of symptoms (headache, sleep problems and subjective joint swelling). The duration of improvement was longer in the treatment group. Patients in the balneotherapy group also experienced higher and longer lasting improvement on most scales of quality of life, using SF-36, than subjects in the control groups [5]. Both studies indicated that treatment of fibromyalgia at the Dead Sea is effective.

In a previous study [7] we demonstrated the efficacy of spa therapy at the Dead Sea area for the treatment of psoriasis and psoriatic arthritis. In that study, 28 of the 146 patients with psoriatic arthritis (19%) also fulfilled the diagnostic criteria for fibromyalgia [8–10].

The aim of the present study was to evaluate the effectiveness of balneotherapy on the subgroup of patients with psoriatic arthritis and fibromyalgia enrolled in our previous study. The clinical effects of balneotherapy on fibromyalgia and psoriatic arthritis were compared.

Patients and Methods

During 26 months patients with psoriatic arthritis were enrolled in our previously published study. All the patients were assessed

for the presence of fibromyalgia [7]. Twenty-eight of these patients were diagnosed as suffering from both psoriatic arthritis and fibromyalgia, and they constituted the present study group. None of the patients prior to our assessment had been diagnosed with fibromyalgia.

Psoriatic arthritis was defined as an inflammatory arthritis in the setting of psoriasis vulgaris. All patients with fibromyalgia had widespread chronic pain and 11 or more tender points, thus meeting the American College of Rheumatology 1990 diagnostic criteria for fibromyalgia [10]. The patients were from Germany, where the cost of treatment of psoriasis by balneotherapy at the Dead Sea area is covered by health insurance policies.

The patients were treated with mudpacks and sulphur baths in addition to the daily regimen of bathing in the Dead Sea and exposure to the sun. Exposure to the sun consisted initially of 10–20 minute sessions in the early morning and in the afternoon, with a gradual increase of session duration to a maximum of 4–6 hours per day. Duration of bathing in the Dead Sea was similarly gradually increased to periods of 20–30 minutes in the morning and in the afternoon. Balneotherapy included bathing for 20 minutes every other day in a sulphur pool heated to 37°C and mudpacks heated to 40–42°C applied to the four extremities, the neck and back, for 20 minutes on alternate days.

The clinical indices assessed were duration of morning stiffness and the number of actively affected joints. A joint was defined as active when at least one of the following findings was present: soft tissue swelling, intraarticular effusion, tenderness over the joint line, or stress pain. All patients were evaluated for fibromyalgia by palpation of the 18 fibrositic tender points. Patients with 11 or more tender points and widespread chronic pain met the American College of Rheumatology 1990 criteria for the classification of fibromyalgia [10]. Thirteen point sites (9 fibrositic points and 4 control points) were further studied by dolorimetry (Pain diagnostic and thermography dolorimeter, model PTO with 17 kg gauge and 200 gram divisions, Great Neck, NY, USA). The nine fibrositic points were the right and left trapezius, the right and left medial knees, the right lateral epicondyle, the right and left second costochondral junctions, the right greater trochanter, and the lower aspect of the neck on the right side. The four control points were the forehead, the distal third of the forearm, the lateral aspect of the knee, and the shaft of the third metatarsal, all on the right side.

The threshold of tenderness was measured using the dolorimeter. The site of maximal tenderness over the fibrositic and control points was determined by preliminary light pressure. The footplate of the dolorimeter was then placed appropriately and held vertically in place. Pressure was increased at a rate of one kg/second, and patients were requested to indicate when the sensation became distinctly painful.

All patients were assessed twice at the Hammei-Zohar spa clinic by a single rheumatologist. The first assessment was performed 2 days after the patients' arrival at the Dead Sea area, before initiation of treatment. The second assessment was conducted during their fourth week of stay at the Dead Sea area, 2 days after their last therapy. All assessments were performed after 10 a.m., but not in the late afternoon.

Paired *t*-tests were performed to evaluate the differences in mean pre- and post-treatment values for continuous variables. Pearson correlation coefficients were computed to assess the association between the reduction in the number of active joints and the reduction in the number and degree of pain in the tender points.

Results

The demographic and clinical characteristics of the patients are summarized in Table 1. For most of the patients it was not possible to determine the duration of fibrositic symptoms. Forty-two percent of the patients were being treated with non-steroidal anti-inflammatory drugs and only 10.7% with disease-remitting medications. No patients were taking systemic steroids during the trial period.

The duration of morning stiffness was reduced from 33.2 ± 23 minutes in the pre-treatment assessment to 12.8 ± 22 minutes in the post-treatment period ($P < 0.005$). The change in number of active joints is summarized in Table 2. The reduction in the number of active joints was found to be statistically significant, and remained so after subgroup analysis by gender.

The threshold for sensitivity to pain, as measured with the dolorimeter in the nine fibrositic and four control points, was significantly improved in both fibrositic tender points and control points [Table 3]. The reduction in the number of tender points was proportionate to the dolorimetric measurements

Table 1. Demographic and clinical characteristics of patients

No. of patients	28
Male	9
Female	19
Average age (yr, range)	48.5 (29–70)
Duration of psoriatic arthritis (yr, SD)	9.5 ± 9.6
Medications used	
None	13 (46.5%)
Non-steroidal anti-inflammatory drugs	12 (42.8%)
Disease remitting drugs	3 (10.7%)
Gold	1
Methotrexate	2
Systemic steroids	0

Table 2. Number of active joints (mean ± D) and tender points in pre- and post-treatment periods (n = 28)

No. of active joints	Pre-treatment	Post-treatment	*P*
All patients	18.4 ± 10.9	9.0 ± 8.2	< 0.001
Male (n = 9)	25.1 ± 8.6	14.4 ± 11.4	0.0049
Female (n = 19)	15.6 ± 10.0	6.8 ± 5.3	< 0.001
No. of tender points	12.9 ± 1.9	7.4 ± 4.1	< 0.001
All patients			
Male (n = 9)	12.6 ± 2.0	7.1 ± 5.0	0.003
Female (n = 19)	13.1 ± 2.0	7.5 ± 3.7	< 0.001

Table 3. Dolorimetric threshold readings (kg, meanSD) for 9 fibrositic tender points and 4 control points in the pre- and post-treatment periods

	Pre-treatment	Post-treatment	*P*
All patients			
Fibrositic points	4.1±1.2	5.4±1.8	<0.001
Control points	5.8±1.4	7.5±2.3	<0.001
Male (n=9)			
Fibrositic points	4.6±1.5	5.6±2.7	NS
Control points	5.7±1.5	7.2±2.8	NS
Female (n=19)			
Fibrositic points	3.81	5.2±1.2	<0.001
Control points	5.9±1.4	7.5±2.1	<0.001

NS = not significant

($r=0.6$). No statistically significant correlation was found between the improvement in the number of inflamed joints and the reduction in the number of tender fibrositic points ($r=0.2$). Neither was a correlation found after dividing the patients into subgroups by gender.

Discussion

Fibromyalgia is a chronic disorder of widespread pain or stiffness in the muscles or joints, accompanied by tenderness on examination at specific predictable anatomic sites known as tender points [8,9]. The prevalence of fibromyalgia in the general population is estimated to be 2% [11], and it affects mainly women.

Fibromyalgia has been well described among patients with systemic lupus erythematosus and rheumatoid arthritis. While the occurrence of fibromyalgia among patients with psoriatic arthritis has not previously been reported, Buskila et al. [12] found that 24% of patients with psoriatic arthritis had 10 or more fibrositic tender points. Our study is the first to study the occurrence of fibromyalgia among patients with psoriatic arthritis. The prevalence of fibromyalgia in our group of patients with psoriatic arthritis was 19.2%. The relatively high percentage of men with fibromyalgia in our study can be attributed to their having secondary rather than primary fibromyalgia, along with the fact that psoriatic arthritis is equally distributed among men and women. None of the 28 patients enrolled in the study had been previously diagnosed or treated for fibromyalgia.

The long-term treatment of fibromyalgia remains problematic because the natural history of this condition appears to be one of continuous and unremitting pain. The lack of an effective medical treatment for fibromyalgia has led to the trial of complementary therapies such as acupuncture, homeopathy, osteopathy, chiropractics and biofeedback [11].

The effect of climatic changes on fibromyalgia has been studied previously, and changes in weather were shown to affect fibromyalgia patients. Yunus et al. [8] found that cold or humid weather deleteriously affects these patients, and Wolfe et al. [10] reported that weather changes affect the intensity of pain in 57% of patients with fibromyalgia and in 43% of patients with rheumatoid arthritis. Guedj and Weinberger [13] found that among the various meteorological variables they studied, only barometric pressure had a measurable effect on the intensity of pain in patients suffering from fibromyalgia. While these studies found a link between weather and the intensity of pain in fibromyalgia patients, other investigators have failed to confirm such an association [11].

We believe that the unique climatic conditions of the Dead Sea area – in particular the low humidity, high and stable temperatures, high barometric pressure (the highest in the world as the Dead Sea is the lowest point on the face of this planet) – had a beneficial effect on symptoms and alleviated pain intensity in our patients.

Two recent studies from our center [5,6] demonstrated an association between staying at the Dead Sea resort area and relief in most fibromyalgia-related symptoms and improvement in quality of life measurements of patients with primary fibromyalgia. Patients who were treated with sulphur baths experienced longer improvement in all measures studied. Taken together, the data suggest that treatment of fibromyalgia at the Dead Sea is effective, and that amelioration in severity and frequency of fibromyalgia-related symptoms lasts longer in patients who have sulphur baths compared to those patients who stayed at the resort area without bathing in the sulphur baths.

We previously reported an amelioration of psoriatic arthritis symptoms following balneotherapy at the Dead Sea area [7]. In addition to the potential benefits of the climate at the Dead Sea, patients were also treated with sulphur baths, mudpacks and bathing in the Dead Sea. The present study does not enable the distinction between the contributions of staying at the Dead Sea area without balneotherapy and the effects of balneotherapy.

The results of our present study point to a statistically significant substantial improvement in the condition of both male and female patients with fibromyalgia with regard to the number of active joints and tender points [Table 2]. We found no correlation between the relief of psoriatic arthritis symptoms, manifested by a reduction in the number of inflamed joints from 18.4±10.9 to 9±8.2 ($P<0.001$) and the reduction in the number of fibrositic tender points described in Table 2. This lack of correlation suggests that the mechanism of improvement in these two conditions is not identical and that climatic factors and balneotherapy may have different effects on the various rheumatic diseases. The absence of correlation between improvement in psoriatic arthritis and improvement in fibromyalgia was probably not due to misdiagnosis of fibromyalgia, as the correlation between the number of tender and control points before and after treatment correlated well with the dolorimetric threshold for pain in tender and control points before and after treatment ($r=0.6$ and 0.48 respectively).

The present study has some limitations, in particular the absence of control groups and the lack of a follow-up assessment after the conclusion of treatment. Additional studies with longer follow-up periods are needed.

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