Efficacy of balneotherapy for osteoarthritis of the knee: a systematic review

Authors’ objectives
To assess the efficacy of balneotherapy in patients with osteoarthritis (OA) of the knee.

Searching
MEDLINE, EMBASE, HeathSTAR, SPORTDiscus, CINAHL, the Cochrane Controlled Trials Register, PEDro, the specialised register of the Cochrane Musculoskeletal Group, and the Cochrane Field of Physical and Related Therapies until September 2002. In addition, reference lists of the included studies were screened and experts (including the co-ordinating offices of the aforementioned Cochrane Groups) were contacted. The search strategy was reported. Studies were included if they were reported in either French or English. Peer-reviewed abstracts were eligible.

Study selection
Study designs of evaluations included in the review
Comparative controlled trials (including randomised controlled trials (RCTs), non-randomised studies, case-control and cohort studies) were eligible for inclusion if they included at least 5 patients in each treatment group. Studies in which the participants acted as their own control were excluded. Where reported, the duration of follow-up in the included studies was 12 weeks.

Specific interventions included in the review
Studies that compared any form or combination of balneotherapy applied to peripheral joints with placebo, no treatment, or other active treatment were eligible for inclusion. Any concurrent interventions had to be given to all treatment groups. The included studies compared different compositions of thermal water balneotherapy with placebo (tap water thermal bath or sweet-water outdoor pool) or compared various forms of balneotherapy (hot sulphur baths, Dead Sea water and combinations of these) with placebo (tap water bath) and each other. In some studies, concomitant treatment with standard anti-inflammatory drugs and pain-killers was permitted; one study did not allow other physical or drug treatments. The interventions lasted between 2 and 3 weeks; the frequency of bathing, where reported, was twice daily or 6 days per week.

Participants included in the review
Studies in adults (aged 18 years or over) with OA were eligible for inclusion. The participants in the included studies had mild to severe OA of the knee, as determined by radiographs. The mean age was approximately 62 years in one study with the age range reported as 40 to 70 years in another; one study did not report this information.

Outcomes assessed in the review
Studies that assessed rehabilitation outcomes were eligible for inclusion. All of the included studies assessed pain but used different measures: visual analogue scale, pain with movement, pressure or at rest, and a 10-point ordinal scale. Other outcomes assessed by the primary studies included range of movement (ROM) of flexion and extension, timed stair climbing and function (measured using the Lequesne index).

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies.

Assessment of study quality
Validity was assessed and scored using the Jadad scale, which considers the reporting and handling of randomisation, blinding and handling of withdrawals. The maximum possible score was 5 points. In addition, the review reported whether or not the methods used to assess pain outcomes had been validated.

Two reviewers independently assessed validity and resolved any disagreements through consensus or through recourse
Data extraction
Two reviewers independently extracted the data using a piloted extraction form, and a third reviewer cross-checked the data. For two studies, the numbers of patients classified as having pain relief were reported together with the risk occurrence and risk difference between treatments. For some outcomes, mean differences or odds ratios (OR) with 95% confidence intervals (CIs) were reported. For one study, the baseline mean, end point mean, absolute benefit and relative change from baseline were presented.

Methods of synthesis
How were the studies combined?
Individual studies were described in the text. The studies were then discussed according to control treatment (placebo or another type of balneotherapy). The results for individual studies were displayed graphically for some comparisons and some outcomes of interest.

How were differences between studies investigated?
Differences between the studies were apparent from inspection of the tables; additional differences were discussed in the text.

Results of the review
Three RCTs (n=160) were included.

The studies scored 2, 4 and 5 out of 5 on the Jadad scale for quality. Two studies were double-blinded. One study reported the use of a validated tool for measuring pain.

Balneotherapy versus placebo (three studies; the authors reported the results from only two studies under this heading).

One study (n=62) reported no significant difference between balneotherapy and placebo in the proportion of patients reporting pain relief at rest, on movement or with pressure at 2 weeks. One study (n=70) reported an increased percentage of patients with improved pain at 2 weeks with balneotherapy versus placebo (31% versus 27%). It reported a significant improvement in pain intensity, ROM of active/passive flexion and extension, and timed ascent and descent of stairs at 2 weeks with balneotherapy versus placebo, but no significant difference between treatments at 12 weeks. The third four-arm study reported no significant difference in pain relief or function between hot sulphur baths or Dead Sea water versus control (no data were reported).

Comparing different types of balneotherapy (one study with four treatment arms, n=40).

This study reported no significant difference for pain intensity or function at 2 or 12 weeks for hot sulphur baths or Dead Sea water versus control, or for hot sulphur baths versus Dead Sea water. It reported that the combination of hot sulphur baths plus Dead Sea water significantly improved pain severity and function in comparison with hot sulphur baths alone or Dead Sea water alone at 2 weeks, but not at 12 weeks.

Authors’ conclusions
Balneotherapy using a combination bath regime improved pain and function in the short-term in patients with OA.

CRD commentary
This review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design; inclusion criteria for the study design and outcomes were broad. Seven databases and registers of trials were searched. The restriction to articles published in two languages might have resulted in the omission of other relevant studies; the authors acknowledged that some studies published in other languages were identified but were not included in the review. However, some attempts were made to minimise publication bias. Two reviewers independently selected
the studies, assessed validity and extracted the data, thus reducing the potential for reviewer bias and errors. Validity was assessed using specified criteria and the results were reported. However, drop-out rates were not reported and it was unclear how many studies had been analysed on an intention-to-treat basis.

Given the differences between the studies, a narrative synthesis was appropriate. Multiple outcomes were reported, which made interpretation of the results difficult and raises the potential for selective reporting of the outcomes. Results about combinations of baths were obtained from one study in which a small number of patients received each treatment; this provided very limited evidence and a more cautious conclusion might have been more appropriate.

**Implications of the review for practice and research**

Practice: The authors stated that the prescription of balneotherapy should follow guidelines for medical treatments and consider indications, contraindications and dosages.

Research: The authors stated that more high-quality RCTs are required to assess the efficacy of balneotherapy (alone or in combination with other treatments) in OA. There is a also a need for studies to compare the cost-effectiveness of balneotherapy with other treatments. Information about the population characteristics (including age, gender, disease characteristics, surgical history and associated medical conditions) should be reported in published studies. In addition, research should aim to determine the most effective treatment to introduce at the various stages of the disease.

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**Other publications of related interest**


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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.