Concise report

Yoga for rheumatic diseases: a systematic review

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Abstract

Objective. To evaluate the quality of evidence and the strength of recommendation for yoga as an ancillary intervention in rheumatic diseases.

Methods. Medline/PubMed, Scopus, the Cochrane Library and IndMED were searched through February 2013. Randomized controlled trials (RCTs) comparing yoga with control interventions in patients with rheumatic diseases were included. Two authors independently assessed the risk of bias using the Cochrane Back Review Group risk of bias tool. The quality of evidence and the strength of the recommendation for or against yoga were graded according to the GRADE recommendations.

Results. Eight RCTs with a total of 559 subjects were included; two RCTs had a low risk of bias. In two RCTs on FM syndrome, there was very low evidence for effects on pain and low evidence for effects on disability. In three RCTs on OA, there was very low evidence for effects on pain and disability. Based on two RCTs, very low evidence was found for effects on pain in RA. No evidence for effects on pain was found in one RCT on CTS. No RCT explicitly reported safety data.

Conclusion. Based on the results of this review, only weak recommendations can be made for the ancillary use of yoga in the management of FM syndrome, OA and RA at this point.

Key words: yoga, complementary therapies, rheumatology, rheumatoid arthritis, osteoarthritis, fibromyalgia, carpal tunnel syndrome, review.

Introduction

Yoga is widely used by patients with a variety of rheumatic diseases. According to the 2002 National Health Interview Survey, patients with rheumatic diseases were 1.56 times more likely to have practiced yoga within the last 12 months compared with the general population [1]. Deriving from ancient Indian philosophy, yoga comprises physical exercise, relaxation and lifestyle modification [2]. In North America and Europe, yoga is most often associated with physical postures, breathing techniques and meditation [3]. Systematic reviews have shown that yoga seems to be a safe and effective intervention for patients with arthritis [4] or FM [5]. However, no systematic review has thoroughly investigated the effects of yoga on rheumatic diseases as a whole. The aim of this systematic review was to evaluate the quality of available evidence and the strength of the recommendation for yoga as a therapeutic means in the management of rheumatic diseases.

Methods


Eligibility criteria

Types of studies
Randomized controlled trials (RCTs) and randomized crossover studies were eligible. No language restrictions were applied.

Types of participants
Patients with rheumatic diseases (e.g. RA, OA, FM, osteoporosis, gout, lupus erythematosus, Paget’s disease, PsA, Raynaud’s disease, reactive arthritis, bursitis, tendinitis, CTS, tarsal tunnel syndrome, plantar fasciitis, SpA, SSC and vasculitis) were eligible.
Types of intervention
Studies that compared yoga interventions with no treatment or any active treatment were eligible. Studies were excluded if yoga was not the main intervention but part of a multimodal intervention. No restrictions were made regarding yoga tradition, length, frequency or duration of the program. Co-interventions were allowed.

Types of outcome
For inclusion, RCTs had to assess at least one primary outcome, i.e., pain intensity or function. Secondary outcomes included quality of life, psychological distress and safety of the intervention.

Search methods
Medline/PubMed, Scopus, the Cochrane Library and IndMED were searched from their inception through 11 February 2013. The complete search strategies for each database are shown in supplementary Table S1, available as supplementary data at Rheumatology Online. Reference lists of identified original articles or reviews and the tables of contents of the International Journal of Yoga Therapy and the Journal of Yoga & Physical Therapy were searched manually. Two review authors independently screened abstracts identified during the literature review and potentially eligible articles were read in full to determine whether they met the eligibility criteria.

Data extraction and management
Data on patients, methods, interventions, control interventions, outcomes and results were extracted by two authors independently using an a priori developed data extraction form. Discrepancies were discussed with a third review author until consensus was reached.

Risk of bias in individual studies
The risk of bias was assessed by two authors independently using the risk of bias tool proposed by the Cochrane Back Review Group [8]. This tool assesses the risk of selection bias, performance bias, attrition bias, reporting bias and detection bias using 12 criteria (ratings: low, unclear or high risk of bias). Differences of opinion were discussed with a third review author until a consensus was reached. Studies that met at least 6 of the 12 criteria and had no serious flaw were rated as having a low risk of bias. Studies that met fewer than six criteria or had a serious flaw were rated as having a high risk of bias [8].

Quality of evidence
Based on the methodological quality and the confidence in the results, the quality of evidence for each outcome in each specific disease was assessed according to the GRADE recommendations as high quality, moderate quality, low quality or very low quality [9].

Strength of recommendation
Based on the direction and quality of the evidence and the risk of undesirable effects of the intervention, the strength of the recommendation for or against yoga as a therapeutic option for each specific disease was judged according to the GRADE recommendations as either strong or weak [9].

Results

Literature search
The literature search revealed 269 non-duplicate records, of which 250 were excluded because they were not RCTs, did not include patients with rheumatic diseases and/or did not include yoga as an intervention. Of 19 full texts assessed for eligibility, 5 articles were excluded because they were either not randomized [10–13] or did not include yoga interventions [14]. Another article was excluded that compared yoga with yoga combined with massage [15]. Thirteen full-text articles reporting on eight RCTs were finally included in the analysis [16–28] (Fig. 1).

The characteristics and overall risk of bias of the included studies are shown in Table 1. In-depth information on the characteristics and results of the included studies can be found in supplementary Table S2, available as supplementary data at Rheumatology Online. Supplementary Table S3, available as supplementary data at Rheumatology Online, shows a detailed risk of bias assessment of the included studies. GRADE criteria for each disease and outcome are shown in supplementary Table S4, available as supplementary data at Rheumatology Online.

FM syndrome
An RCT with low risk of bias from the USA assessed the effects of an 8-week Yoga of Awareness intervention compared with usual care in 56 female FM patients (mean age 53.7 years) [17, 18]. The yoga intervention included yoga postures, meditation, breathing techniques and lessons on yogic coping strategies. Outcome measures included pain, using number of tender points and extent of tenderness, and disability, using the Fibromyalgia Impact Questionnaire (FIQ). Significant group differences were found for disability only; no safety data were reported.

A second RCT originated from Brazil, had low risk of bias and assessed the effects of a water-based breathing yoga intervention, 60 min four times a week over a period of 4 weeks, in 40 female FM patients (mean age 46.06 years) [26]. The intervention included breathing techniques, but no yoga postures or meditation. Both the intervention and the control group participated in recreational activities once weekly. This RCT reported significant group differences favouring the yoga group in pain on a visual analogue scale (VAS), disability on the FIQ and anxiety on the Hamilton Anxiety Scale (HAS). No safety data were reported.

Using the GRADE approach, the quality of evidence for pain in FM syndrome was very low and the quality of evidence for disability was low. Overall, a weak recommendation can be made for the use of yoga in FM syndrome.
OA

An Indian trial with a high risk of bias included 250 patients with OA of the knee (69.9% female; mean age 59.49 years). This RCT compared a 2-week hatha yoga intervention including yoga postures, meditation, relaxation, breathing techniques and lectures for 40 min each day with an aerobic exercise intervention of matched intensity [19–22]. Significant group differences were found for pain at rest and while walking assessed on a VAS, disability on the WOMAC, all subscales of health-related quality of life on the Short Form 36 Health Survey (SF-36) and anxiety on the State-Trait Anxiety Inventory (STAI). While safety data were not included, three drop-outs due to adverse events in the control group and none in the yoga group were reported [19–22].

An RCT from the USA included 25 patients with OA of the interphalangeal joints. The RCT had a risk of bias. Age ranged from 52 to 79 years and 56% were female [24]. Compared with usual care, a 10-week Iyengar yoga intervention including 60 min of yoga postures, relaxation and education twice weekly resulted in significant group differences in hand pain during activities on a VAS but not in pain at rest on a VAS or disability on the Stanford Hand Assessment Questionnaire. Safety data were not reported [24].

Originating from the USA, a third RCT compared chair yoga (sitting meditation) twice weekly for 45 min over 8 weeks with Reiki (a spiritual healing intervention) once weekly for 30 min over 8 weeks [27]. Twenty-one patients with OA of different joints were included (mean age 80.0 years). Significant group differences were found for the WOMAC disability scale but not for the WOMAC pain scale or depression on the Center for Epidemiologic Studies Depression Scale (CES-D). No safety data were reported [27].

According to the GRADE approach, the overall quality of evidence for effects of yoga on pain and disability in OA was graded very low. A weak recommendation can be made for the use of yoga in OA.

RA

An RCT with a high risk of bias from the USA compared a 6-week Iyengar yoga intervention including yoga postures and relaxation 90 min twice weekly with usual care [23]. The RCT included 30 young women (mean age 29.9 years) with RA. The RCT found no group differences in bodily pain on the SF-36. Significant effects were reported for disability using the Health Assessment Questionnaire Disability Index (HAQ-DI) and the Pain Disability Index (PDI), for vitality and general health on the SF-36 and for distress on the Brief Symptom Inventory. Safety was not reported.

A second RCT originating from India had a high risk of bias [28]. This RCT included 80 patients with RA (mean age 35.08 years, 70% female). The yoga intervention included postures, cleansing practices, breathing techniques, meditation and lifestyle advice for 90 min six times each week for 7 weeks. Compared with usual care, yoga significantly reduced pain on the Simple
### Table 1 Characteristics of the included studies

<table>
<thead>
<tr>
<th>Reference</th>
<th>Rheumatic disease</th>
<th>Sample size, n</th>
<th>Treatment duration, weeks</th>
<th>Experimental intervention</th>
<th>Control intervention</th>
<th>Outcome assessment</th>
<th>Outcome measures</th>
<th>Risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson et al. [17, 18]</td>
<td>FM syndrome</td>
<td>56</td>
<td>8</td>
<td>Yoga of awareness, 120 min/week</td>
<td>Usual care</td>
<td>8 weeks</td>
<td>Pain (myalgic tender points), disability (FIQ-R)</td>
<td>Low</td>
</tr>
<tr>
<td>Ebnezar et al. [19-22]</td>
<td>OA of the knee</td>
<td>250</td>
<td>12</td>
<td>Hatha yoga, 280 min/week</td>
<td>Exercise, 280 min/week</td>
<td>2 weeks</td>
<td>Pain (pain at rest, pain while walking on VAS), disability (WOMAC), quality of life (SF-36), anxiety (STAI), safety (drop-outs)</td>
<td>High</td>
</tr>
<tr>
<td>Evans et al. [23]</td>
<td>RA</td>
<td>30</td>
<td>6</td>
<td>Iyengar yoga, 180 min/week</td>
<td>Usual care</td>
<td>6 weeks</td>
<td>Disability (PDI, HAQ-DI), quality of life (SF-36), distress (BSI)</td>
<td>High</td>
</tr>
<tr>
<td>Garfinkel et al. [24]</td>
<td>OA of the hand</td>
<td>25</td>
<td>10</td>
<td>Iyengar yoga, 60 min/week</td>
<td>Usual care</td>
<td>10 weeks</td>
<td>Pain (pain at rest, pain during activity on VAS), disability (Stanford Hand Assessment Questionnaire)</td>
<td>High</td>
</tr>
<tr>
<td>Garfinkel et al. [25]</td>
<td>CTS</td>
<td>51</td>
<td>8</td>
<td>Iyengar yoga, 90 min/week</td>
<td>Wrist splint</td>
<td>8 weeks</td>
<td>Pain (VAS), disability (FIQ), quality of life (SF-36), anxiety (HAS)</td>
<td>High</td>
</tr>
<tr>
<td>Ide et al. [26]</td>
<td>FM syndrome</td>
<td>40</td>
<td>4</td>
<td>Yoga breathing exercise, 240 min/week</td>
<td>Recreational activities, 60 min/week</td>
<td>4 weeks</td>
<td>Pain (VAS), disability (FIQ), quality of life (SF-36), anxiety (HAS)</td>
<td>Low</td>
</tr>
<tr>
<td>Park et al. [27]</td>
<td>OA of the hip or knee</td>
<td>29</td>
<td>8</td>
<td>Chair yoga, 90 min/week</td>
<td>Reiki, 30 min/week</td>
<td>8 weeks</td>
<td>Disability (WOMAC), depression (CES-D)</td>
<td>High</td>
</tr>
<tr>
<td>Singh et al. [28]</td>
<td>RA</td>
<td>80</td>
<td>7</td>
<td>Yoga, 540 min/week</td>
<td>Usual care</td>
<td>7 weeks</td>
<td>Pain (SDPIS)</td>
<td>High</td>
</tr>
</tbody>
</table>

FIQ-R: Revised FIQ.
Yoga for rheumatic diseases

Descriptive Pain Intensity Scale (SDPIS). Safety data were not reported.

Using GRADE, the quality of evidence for the effects of yoga on pain was graded as very low. Only a weak recommendation can be made for the use of yoga in RA.

CTS
A US RCT with a high risk of bias included 51 CTS patients (mean age 48.08 years, 54.9% female). The RCT compared an 8-week Iyengar yoga intervention, 90 min twice weekly, including yoga postures and relaxation, with a standard wrist splint [25]. As this RCT did not find significant group differences in pain on a VAS and did not report safety data, no recommendation can be made for or against yoga in CTS.

Discussion
This systematic review of eight RCTs on yoga for rheumatic diseases found very low to low quality evidence for FM, very low quality evidence for OA and RA and no evidence for CTS. While no RCT reported safety data, prior systematic reviews on other conditions found no evidence for severe adverse events [29–34]. Therefore a weak recommendation for the use of yoga as an ancillary intervention in FM, OA and RA can be made.

Agreements with prior systematic reviews
The findings of this review are partly in line with a prior systematic review that found evidence of the effectiveness of yoga in improving pain and mental health in patients with OA and RA but concluded that the heterogeneity of studies precluded preliminary conclusions [4]. Based on the same RCTs as the present review [17, 18, 26], a systematic review on meditative movement therapies for FM found evidence of the effectiveness of yoga on pain, depression and quality of life [5]. Mainly based on low back pain studies, two recent meta-analyses on yoga for musculoskeletal conditions [29] or pain [30] concluded that there was good quality evidence of effectiveness on pain and disability. Based on the same single RCT as the present review [25], systematic reviews on conservative treatment of CTS concluded that there was very limited [35] to limited [36] evidence of the effectiveness of yoga in this condition. A recent Cochrane review statistically reanalysed this RCT and found favourable effects of yoga on pain [37].

External and internal validity
Patients of a wide age range with rheumatic diseases diagnosed mainly by the ACR criteria were recruited from secondary and tertiary care centres in North and South America and Asia. Especially in RCTs on FM and RA, mainly female patients were included. The results of this review therefore seem to be applicable to most patients with rheumatic diseases in clinical practice while the small number of studies on each disease limits this interpretation. The results for FM and RA might not be fully applicable to male patients.

Only two RCTs had a low risk of bias. Therefore, while the effects for FM found in this review seem to be robust against methodological bias, the effects found for RA and OA have to be interpreted with care.

Limitations
The primary limitation of this review is the small number and low methodological quality of the included RCTs. Only for FM syndrome were high quality RCTs available and the evidence drawn from these studies is still limited by the heterogeneity of interventions and outcome measures. The evidence for effects on OA is further limited by the heterogeneity of the affected joints studied in the included trials. As no RCT reported safety data, the recommendations for yoga have to be regarded as preliminary until the safety of the interventions is clarified.

Conclusion
Based on the results of this review, weak recommendations can be made for the ancillary use of yoga in the management of FM syndrome, OA and RA.

Rheumatology key messages
- A limited number of randomized trials have investigated yoga as a treatment for rheumatic diseases.
- Yoga might be considered as an ancillary treatment for FM syndrome, OA and RA.

Funding: This work was supported by the Rut- and Klaus-BalhSen-Foundation.

Disclosure statement: The authors have declared no conflicts of interest.

Supplementary data
Supplementary data are available at Rheumatology Online.

References
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