
Design: Meta-analysis of randomized clinical trials

PICOS:

- Patient population: Adults with low back pain of any cause, duration, intensity, or radiation pattern
  - Acute back pain was less than 6 weeks duration
  - Subacute pain was 6-12 weeks duration
  - Chronic pain was more than 12 weeks duration
- Intervention: Yoga as a main treatment intervention, regardless of yoga tradition, length, frequency, or duration
  - Yoga as part of a multimodal intervention was excluded
  - Studies of yogic lifestyle or meditation were excluded if yoga exercise was not the mainstay of treatment
- Comparison intervention: no treatment, usual care, education, exercise
  - If studies had more than one comparison group, the control groups were selected in the following order of preference: no treatment, usual care, education, exercise
- Outcome measures: pain, back-specific disability, quality of life, generic disability such as work absenteeism, and global improvement
  - “Short term” outcomes were considered to be those measured closest to 12 weeks after randomization; “long term” outcomes were those measured closest to 12 months after randomization
- Study types: Randomized controlled trials published as full papers in any language

Study selection:

- Two reviewers independently selected articles for inclusion and rated them for risk of bias
- Databases were MEDLINE, EMBASE, the Cochrane Library, PsycINFO, and CAMBASE, searched through January 2012, along with reference lists of original articles
- Risk of bias was based upon the methods of the Cochrane Back Review Group; studies that met 6 or more of 12 criteria were considered at low risk of bias
  - Strong evidence was considered to be multiple RCTs with low risk of bias and consistent findings
- Moderate evidence meant consistent findings among multiple RCTs with high risk of bias and/or 1 low risk RCT
- Limited evidence meant 1 RCT with high risk of bias
- Conflicting evidence meant inconsistent findings among multiple RCTs
- No evidence meant no RCTs

Results:

- 12 full text articles were assessed for eligibility; 10 studies with 967 patients were selected for analysis
  - 2 studies compared yoga to usual care
  - 7 studies compared yoga to some form of education
    - 5 studies provided an educational book on self-care
    - 1 study provided a weekly newsletter on back care and 2 60-minute physical therapy education sessions
    - 1 study provided a detailed program on lifestyle and diet
  - 3 studies compared yoga to exercise programs, all of which were of the same duration and frequency as the yoga program
  - 8 studies were rated as having a low risk of bias
- Multiple outcome measures were used
  - 7 studies reported on pain
  - 8 studies reported back-specific disability
  - 5 studies reported a quality of life measure
  - 4 studies reported data on number of days with restricted activity, but the data was insufficient for meta-analysis
  - 2 studies reported on global improvement
- Short term treatment effects were estimated for pain, back-specific disability, quality of life, and global improvement
  - For pain, disability, and quality of life, treatment effects were reported as standardized mean differences (SMD)
    - SMD=0.2 to 0.5 is small
    - SMD=0.5 to 0.8 is moderate
    - SMD > 0.8 is large
  - For global improvement, the treatment effects were reported as relative risks (RR), where the “risk” of global improvement is greater than 1 when the treatment is effective
- Short-term meta-analysis revealed “strong” evidence for effects of yoga on pain (SMD from 6 studies of 0.48 is “small” effect size) and for back-specific disability (SMD from 8 studies of 0.59 is moderate effect size), but no evidence was found for an effect on short-term quality of life
The meta-analysis pooled evidence from control groups using exercise, educational booklets, and waiting list controls

- Heterogeneity of effects was not found for pain, but was found for back-specific disability

  - Short term meta-analysis also pooled results from 2 studies to produce “strong” evidence of greater effectiveness of yoga over education for global improvement (RR was 3.27)
  
  - Long-term meta-analysis showed moderate evidence for pain reduction (SMD from 5 studies was a small effect size of 0.33), and moderate evidence for lower disability (SMD from 5 studies was a small effect size of 0.35), but no evidence concerning quality of life

- Some subgroup analyses were done comparing yoga with defined interventions, when enough information was available
  
  - There was no evidence that yoga was superior to usual care (2 studies) for short-term disability
  - There was strong evidence (5 studies) that yoga was superior to education for pain and disability, but the effect size was small (0.45 SD)
    - There was strong evidence for yoga over education on short-term global improvement (RR=3.27)
  
- There was no evidence that yoga was better than exercise on disability

- Three studies reported adverse effects which were mild to moderate; one study reported a herniated disc in one patient

Authors’ conclusions:

- There was strong evidence in favor of yoga for short-term effects in reducing low back pain and disability
- There was moderate evidence in favor of yoga for long-term effects in reducing low back pain and disability
- Yoga was more effective than education, but there was insufficient data to show that yoga was better than usual care or exercise
- There appear to be few serious adverse effects with yoga
- There were only a few eligible RCTs, and meta-analyses could be done for only a few comparisons
- Yoga can be recommended for LBP patients who do not improve with education or self-care options

Comments:

- Overall, the process of study selection and the presentation of results are satisfactory
The effect size classification into small, moderate, and large is sensitive to small fluctuations in the data; for example, the pooled effect size of 0.48 SD is called “small” because it is less than 0.50, but this difference is somewhat arbitrary.

The authors wanted to select studies from a wide variety of settings and cultures (most patients were female Caucasians), and this inclusiveness may account for some heterogeneity for some comparisons.

- Figure 2, the forest plot for back-specific disability, pools results from 8 studies yielding a moderate effect size of 0.59 SD with heterogeneity of 59%.
- One study (Tekur 2008) had a very large effect size (1.25 SD in favor of yoga over exercise), and its methodology was satisfactory for inclusion.
- However, the Tekur study was done in India and involved interventions which are likely to be impractical in a Workers’ Compensation setting.
  - The week-long yoga program began at 5:00 each morning with “Om” meditation for 30 minutes, and had later sessions of chanting verses from the Bhagavad Gita.
  - If the Tekur study is removed from the analysis, the “moderate” effect of yoga becomes a “small” effect and the heterogeneity is reduced from 59% to 15%.

- The two studies providing strong evidence of yoga’s superiority over education for short-term global improvement defined “education” as giving the patient a book (not as individual classroom instruction).
- Many of the meta-analyses were (as the authors note) limited by the published data available; there were 2 studies comparing yoga with usual care and 5 studies comparing yoga with educational printed material, which could account for why the authors could find strong evidence that yoga is better than simply sending the patient away with a booklet.
- The comparison of yoga with exercise was based on the Tekur study (done in India) and the Sherman 2011 study (done in the United States).
  - The Sherman study showed that yoga was better than a booklet, but not better than an exercise program in which stretching of the major muscle groups was done in a class led by a licensed physical therapist.
The Sherman study provides a more realistic comparison than the Tekur study for consideration in a Workers’ Compensation setting.

Assessment: Provides strong evidence that yoga has small to moderate advantages over providing only a booklet in reducing low back pain and back-specific disability, but no evidence that yoga is superior to stretching and strengthening classes led by a licensed physical therapist.

References:
