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Tai chi for osteoarthritis: a systematic review

MS Lee, MH Pittler, and E Ernst.

Review published: 2008.

CRD summary

Overall findings suggested that tai chi may be effective for controlling pain associated with knee osteoarthritis, but there was no convincing evidence for pain reduction or improvement of physical function. The authors' cautious conclusion appears reasonable, but it should be noted that it was based on trials with small sample sizes, some of which were of low-quality.

Authors' objectives

To evaluate the effectiveness of the complementary therapy tai chi for the treatment of osteoarthritis.

Searching

The following databases were searched from inception to June 2007: MEDLINE, AMED, British Nursing Index, CINAHL, EMBASE, PsycINFO, National Institute of Health and National Research Register Clinicaltrials.gov), the Cochrane Library 2007 (Issue 2), Korean databases (details reported), the Qigong and Energy Medicine Databases and Chinese medical databases (details reported). Search terms were reported. Handsearching of relevant journals and authors' files was conducted. Experts in the field were contacted for additional studies. Reference lists of located articles and proceedings of the International Conference of Tai Chi for Health (2006) were also scanned for relevant data. No language restrictions were applied.

Study selection

Prospective controlled trials evaluating the effectiveness of tai chi with any type of control for the treatment of osteoarthritis were eligible for inclusion. Abstracts and dissertations were also eligible for inclusion.

The included trials evaluated tai chi compared with routine treatment, physical activity, attention control, self-help management, aquatic exercise, bingo recreation, waiting list, and no treatment. The duration of tai chi sessions ranged from 40 minutes to 120 minutes for six weeks to six months. The number of sessions each week varied between trials. Where reported, participants included in the review had osteoarthritis of the hip, knee, ankles and foot. Included trials reported on psychological symptoms, pain, physical function, flexibility, balance, stiffness, fatigue, and quality of life. These outcomes were measured using various tools including: the visual analogue scale (VAS); arthritis impact measurement scale (AIMS); Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC); and activities of daily living (ADL) scales.

The authors did not state how papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality

Validity was assessed using the Jadad score assessing randomisation, blinding and withdrawals (maximum score of 5 points). One point was assigned if the outcome assessor was blinded.

Two reviewers independently assessed validity. Disagreements were resolved by discussion or by recourse to a third reviewer.

Data extraction

Two reviewers independently extracted data. Disagreements were resolved by discussion or by recourse to a third reviewer.

Methods of synthesis

The trials were combined in a narrative synthesis. Additional data were reported in tables. Heterogeneity was reported but it was unclear how this was assessed.

Results of the review

Twelve trials (n=682 participants) were included in the review: five randomised controlled trials (RCTs, n=322 participants) and seven non-randomised controlled trials (CCTs, n=360 participants). Two RCTs scored 4 points on the Jadad scale, while three RCTs scored 3 points. Five CCTs scored 1 point on the Jadad scale and two CCTs scored 0 points. All five RCTs described the method of randomisation. Three RCTs reported details of allocation concealment. Ten trials reported sufficient details of withdrawals and dropouts. Significant heterogeneity was reported between studies (data not reported).

Pain (five RCTs, six CCTs): Statistically significant greater reductions were reported for pain scores for tai chi compared with: attention control program for VAS pain scores ($p < 0.05$, one RCT) and routine treatment for WOMAC pain scores ($p < 0.05$, one RCT) for osteoarthritis of the knee; no treatment (p values ranging from < 0.05 to < 0.0001 , three CCTs); an arthritis self-help management programme for the WOMAC scale ($p < 0.05$, one CCT); either aquatic exercise ($p < 0.05$) or a self help management program ($p < 0.05$, one CCT).

However no statistically significant reductions on pain subscales were reported for AIMS or WOMAC pain scores comparing tai chi with physical activity, hypnotherapy or waiting list, or bingo recreation for multiple sites of pain (three RCTs), or comparing tai chi with an arthritis self-help management program using the VAS scale (one CCT).

Function (four RCTs, two CCTs): Significant improvements in physical function were found for tai chi compared with: routine treatment for ADL scale pain scores ($p < 0.01$, one RCT); waiting list control for WOMAC scales pain scores ($p < 0.05$, one RCT) but not for tai chi compared to hydrotherapy. Significant improvements were also found for tai chi compared with a self-help management programme ($p < 0.05$, one CCT); or no treatment for ADL scores pain scores ($p < 0.05$, one CCT). But no significant differences for function were found comparing tai chi with attention control (one RCT) or

bingo recreation (one RCT).

Balance (one RCT, five CCTs): Tai chi was reported to significantly improve balance in comparison with: routine treatment ($p < 0.005$, one RCT); or no treatment for two CCTs ($p < 0.01$ and $p < 0.05$) but not for one CCT. Two CCTs reported significant improvement with tai chi compared to self help management programmes ($p < 0.05$ and $p < 0.01$).

Flexibility (four CCTs): Significant improvements were reported in flexibility for tai chi groups compared to no treatment for one CCT ($p < 0.05$) but two CCTs show no significant differences. One CCT reported significant improvements in angle of right ankle dorsiflexion ($p < 0.01$) for tai chi compared with self-help management programmes.

Quality of life (two RCTs, one CCT): Improved results for AIMS subscales for tension ($p < 0.005$) and satisfaction ($p < 0.001$) were reported for tai chi compared with routine care (one RCT), but no statistically significant differences were found for comparisons with hydrotherapy or waiting list (one RCT) or no treatment (one CCT).

Authors' conclusions

Overall findings suggested that tai chi may be effective for controlling pain associated with knee osteoarthritis, but here was no convincing evidence for pain reduction or improvement of physical function.

CRD commentary

Inclusion criteria were clearly defined for intervention, participants and study design. Several relevant sources were searched without language restriction. Efforts were made to minimise publication bias. Methods were used to minimise reviewer errors and bias in the assessment of validity and extraction of data, but it was not clear whether similar steps were taken in study selection. Validity was assessed using an established checklist, but only the composite score was presented, which made it difficult for the reader to judge the study validity for themselves. A narrative synthesis was appropriate given the differences between trials. The authors appropriately highlighted limitations of the review, including small sample sizes and low methodological quality for a number of the included trials. The authors' cautious conclusion appeared reasonable, but it should be noted that it was based on trials with small sample sizes, some of which were of low-quality.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that further RCTs are required to assess larger population samples for longer treatment periods using appropriate control groups.

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review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.

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CRD has determined that this article meets the DARE scientific quality criteria for a systematic review.

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