



Acupuncture Therapy in the Treatment of Osteoarthritis of the Knee

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Abstract

Osteoarthritis (OA) is a chronic condition that affects the joints of the body, most commonly the knees; it has the potential to cause debilitating pain, stiffness and decrease quality of life. The current management involves lifestyle modifications of a healthy diet and exercise as well as analgesics like NSAIDs or acetaminophen to manage symptoms. Long-term use of these medications has been associated with many side effects affecting the GI and CV system. This review analyzes the use of acupuncture therapy (I) for symptom management (O) in patients aged 60-80 years old suffering from mild to moderate OA of the knee (P) as compared to sham acupuncture (C).

Introduction

Osteoarthritis (OA)

Overview

- Affects +30 million Americans
- Due to biomechanical and metabolic factors (alter articular cartilage and bone)

Symptoms

- Joint pain, stiffness, tenderness, reduced mobility
- Symptoms can be so severe causing debilitation and reduced QoL

Treatment

- First line treatment includes lifestyle modifications and symptom management with Tylenol or NSAIDs
- Acupuncture has been seen as a possible alternative treatment option
- Acupuncture is widely accepted in China and Japan; first documented use as a treatment in China (100 BCE) - *The Yellow Emperor’s Classic of Internal Medicine*

Methods

Literature search

- Performed in Nov. 2019 using Google Scholar, EBSCO host and PubMed
- Search terms- “acupuncture and sham acupuncture and mild to moderate knee osteoarthritis and OA and NSAIDS” and “acupuncture and knee osteoarthritis and sham acupuncture”
- Inclusion Criteria:
 - Age of subjects (60 – 80 years old)
 - Type and severity of osteoarthritis (knee, mild to moderate)
 - Type of acupuncture (needle or sham acupuncture)
 - RCT or SR published after 1998
- Exclusion Criteria:
 - Studies that involved a meta-analysis
 - Clinical trials that involved animals
 - Studies that did not include a clinical trial.
 - Studies involving a subject mean age under 60 years old
 - Studies that focused on severe osteoarthritis

Results

1. Berman B, Lao L, Langenberg P, et al. Effectiveness of Acupuncture as Adjunctive Therapy in Osteoarthritis of the Knee. *Ann Intern Med.* 2005; 141(12): 901-910. DOI: 10.7326/0003-4819-141-12-200412210-00006
RCT of 570 participants designed to test the efficacy of acupuncture in the treatment of moderate OA of the knee when compared to sham-acupuncture (placebo) over a 26-week period

2. Tukmachi E, Jubb R, Dempsey E, et al. The effect of acupuncture on the symptoms of knee osteoarthritis – an open randomized controlled study. *Acupunct Med.* 2004; 24(1): 14-22. DOI:10.1136/aim.22.1.14
RCT of 29 participants designed to investigate the efficacy of acupuncture alone or as an adjunctive therapy on the symptoms of patients with knee OA

3. Vas J, Méndez C, Perea-Milla E, et al. Acupuncture as a complementary therapy to the pharmacological treatment of osteoarthritis of the knee: randomized controlled trial. *BMJ.* 2004; 329(7476): 1216. DOI: 10.1136/bmj.38238.601447.3A
RCT of 97 participants which investigated acupuncture's efficacy as a complementary therapy to pharmacological treatment

4. Ezzo J, Hadhazy V, Birch S, et al. Acupuncture for osteoarthritis of the knee: A systematic review. *Arthritis and Rheumatol.* 2001; 44(4): 819-825. DOI: 10.1002/15290131(200104)44:4<819::AID-ANR138>3.0.CO;2-P
SR of 7 RCT's involving a total of 393 participants; investigated acupuncture's efficacy in pain relief from knee OA

5. Selfe T, Taylor A. Acupuncture and osteoarthritis of the knee: A review of randomized, controlled trials. *Fam Community Health.* 2008; 31(3):247-254. DOI: 10.1097/01.FCH.0000324482.78577.0f
SR of 10 RCT's involving a total of 1456 participants; studied acupuncture's efficacy in pain relief from knee OA compared to multiple controls

6. Jubb R, Tukmachi E, Jones P, et al. A blinded randomized trial of acupuncture (manual and electroacupuncture) compared with a non-penetrating sham for the symptoms of osteoarthritis of the knee. *Acupunct Med.* 2008; 26(2):69-78. <https://journals-sagepub-com.arcadia.idm.oclc.org/doi/pdf/10.1136/aim.26.2.69>. Accessed January 10, 2020.
RCT of 68 participants designed to test the efficacy of acupuncture in the treatment of moderate OA of the knee compared to sham-acupuncture (placebo) in addition to investigating the mechanism of acupuncture's symptom relief over a 5-week period

7. Sun N, Tu J, Lin L, Li Y, Yang J, Shi G, Lao L, Liu C. Correlation between acupuncture dose and effectiveness in the treatment of knee osteoarthritis: A systematic review. *Acupunct Med.* 2019; 37(5): 261-267. DOI: 10.1136/acupmed-2017-011608
SR of 8 RCT's involving a total of 2106 participants in order to determine if the effect of acupuncture is dose dependent for symptom management in osteoarthritis of the knee

Table 1. Validity Assessment: Acupuncture vs. Sham Acupuncture

Study	Sample Size	Recruitment Strategies	Blinding	Timeline	Biases	Data Analyses	Power
Berman B, et al.	A	A	A	A	A	A	A
Tukmachi E, et al.	I	A	A	M	M	A	M
Vas J, et al.	A	A	A	M	A	A	A
Ezzo J, et al.	A	A	A – 3/7 trials I – 4/7	M	I	A	M
Sun N, et al.	A	A	A	A	A	A	A
Jubb R, et al.	M	A	A	I	A	A	M
Selfe T, Taylor A	A	A	M	A	N/A	M	M

Key: A – Adequate, M- Marginal, I -Inadequate

Table 2. Summary of Results: Acupuncture vs. Sham Acupuncture

Study	WOMAC pain	WOMAC function	WOMAC stiffness	VAS	Patient Global Assessment	SF-36 Health Score	Total dose of diclofenac	PQLC	Total
Berman B, et al.	NS	S	N/A	N/A	NS	NS	N/A	N/A	NS
Tukmachi E, et al.	S	N/A	S	S	N/A	N/A	N/A	N/A	S
Vas J, et al.	S	S	S	S	N/A	N/A	S	S	S
Ezzo J, et al.	S	NS	N/A	N/A	N/A	N/A	N/A	N/A	NS
Sun N, et al.	S	S	N/A	N/A	N/A	N/A	N/A	N/A	S
Jubb R, et al.	S	NS	NS	S	N/A	N/A	N/A	N/A	S
Selfe T, Taylor A	S	S	N/A	S	N/S	N/A	N/A	N/A	S

Key: S – Statistically Significant, NS – Not Significant, N/A – results not available

Discussion

An overall positive result was seen in all studies reviewed from the use of acupuncture as an alternative treatment, adjunct treatment or stand-alone treatment option for osteoarthritis of the knee. Every study had at least one outcome that was found to have a **positive and statistically significant (p ≤ 0.05) result supporting the use of acupuncture for OA**. However, the seven studies examined differed in designs and outcomes.

Strengths

- At least one significantly positive outcome in each study
- No negative outcomes
- Adequate blinding procedures
- Positive acute outcomes
- Minimal biases
- Appropriate subject demographics (age, sex)
- Adequate recruitment methods

Limitations

- Small sample size in 2/7 studies
- Inability of having a double blind study
- Short study duration w/o long term follow up

Future Research

- Effects of acupuncture intervention to just pharmaceutical intervention
- Long term effects of acupuncture; with adequate long term follow-up
- Cost effectiveness of acupuncture vs. cost of other interventions and medical complication



Conclusion

The evidence compiled within this review is enough to encourage pursuing more data on the efficacy of acupuncture in OA symptom management. The purpose of this review was to see if acupuncture would provide greater symptom relief than sham acupuncture over the same duration. Overall, the studies found that acupuncture when compared to their respective control groups, had greater improvements in symptom relief from knee OA. With this evidence it can be concluded that **acupuncture is more than just a placebo effect**. Although with this answer, a new question is formed; one that compares the symptom relief from acupuncture to that of analgesics in knee OA.

This can also be used by providers to provide the best possible care for their patients suffering with knee osteoarthritis. This study does not warrant a drastic change in the management of knee OA but does implore providers to research and acknowledge acupuncture as being a potential and safe option to patients who are most at risk of analgesic side effects or to those who are just not finding relief from the traditional management.

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