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Is acupuncture effective in improving the mental health in adults with chronic neck pain?

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

The Degree of Master of Science

In

Health Sciences – Physician Assistant

Department of Physician Assistant Studies
Philadelphia College of Osteopathic Medicine – GA Campus
Suwannee, Georgia

December 18, 2020

ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not acupuncture is effective in treating chronic neck pain in patients between the ages of 25-70y/o.

Study design: Review of three randomized controlled trials published in English language between 2010-2018.

Data sources: Three RCTs published in peer reviewed journals, searched through PubMed.

Outcome measured: The outcome measured included improvement in mental health. This was measured using short form 36 (SF-36).

Results: Cerezo-Téllez et al treatment showed significant improvement in patients mental health 3 months post acupuncture treatment compared to sham acupuncture. Liang et al also found significant improvement in mental health following acupuncture treatment compared to stretching alone. Sun et al also revealed significant improvement in patient's mental health 3 month following acupuncture treatment compared to sham acupuncture. All three studies measured results 3 months post treatment indicating long-term effectiveness of acupuncture.

Conclusion: The review show that the use of acupuncture is an effective way to improve the mental health of patients with chronic neck pain. The lack of side effects and improvement long term make acupuncture an effective treatment. More research is needed to look at which duration of intervention improves mental health to the greatest extent.

Key words: Acupuncture, neck pain, quality of life, mental health

INTRODUCTION

Chronic pain is an unpleasant sensory and emotional experience that may negatively affect the behavior and the well-being of the individual, as well as interfere with daily activities that can make life difficult.¹ The persistence of chronic neck pain can have a psychological impact on the individual. People who have persistent pain may feel anxious about the meaning of their symptoms and the future of their pain.¹

To help these patients, new treatment methods such as acupuncture are being studied. Chronic neck pain is defined as neck pain that lasts greater than 12 weeks. Acupuncture is a practice used in Chinese medicine and is a technique in which licensed practitioners use needles to stimulate points on the body. Acupuncture is derived from the Latin words "acus" (needle) and "punctura" (penetration).² Metal needles are inserted into precisely defined points to correct disruption in harmony.² Acupuncture treatments are usually individualized, catered to the individual and not to the condition.²

Neck pain has an annual prevalence rate typically ranging between 30% and 50%; the 12-month prevalence of activity-limiting pain was 1.7% to 11.5%.³ It is found to be more prevalent among women and peaked in middle age.³ Risk factors for neck pain included genetics, poor psychological health, and exposure to tobacco.³ An analysis by the *Journal of the American Medical Association* (JAMA) on United States (US) health care spending, revealed that low back and neck pain accounted for the third highest amount of spending at \$87.6 billion.⁴ There is not an exact estimate available within the past few years; however, in 2012, of the 125 million U.S. adults that reported a musculoskeletal pain disorder, 17,875,000 (14.3%) reported neck pain.⁵

It is believed that chronic neck pain is due to nonspecific disorders of the muscles, tendons, joints and bones of the neck and shoulder, which is associated with unspecified

degenerative changes.⁶ Chronic neck pain refers to the pain and numbness on patients' neck and shoulder and is sometimes accompanied by numbness and radicular pain to the arms and fingers, and the duration of the symptoms usually lasts for more than 12 weeks.⁷ Some symptoms are limited cervical spine mobility and neck muscle weakness, which may be often related to other problems, such as, vertebral, neck or shoulder impaired function, and mental and physical stress at work.⁷ Patients have more functional limitations and catastrophizing beliefs that may cause disability, lower vitality and worsen general health status, all of which affect one into the other, and may lead to a negative impact on health-related quality of life.⁷

For the management of chronic neck pain, there is no consensus on optimal treatment. Options for non-pharmacologic therapy consist of exercise therapy, stretching, electrotherapy, manual therapy, and acupuncture.⁷ Traditional pharmacologic therapy includes non-steroidal anti-inflammatory drugs, tramadol, and tricyclic antidepressants.⁸ Some patients may even require surgery such as cervical fusion via anterior or posterior approach, cervical fusion, or hardware insertion. There is insufficient evidence on the efficacy and effectiveness of conservative interventions for chronic non-specific neck pain. Acupuncture has been able to yield positive results and improvement in patients with other conditions like that of chronic neck pain such as: chronic back pain, knee pain, and headaches. Therefore, acupuncture is becoming a cost-effective, complementary, and attractive approach for patients with chronic neck pain.

This paper evaluates 3 double blind, randomized, controlled trials comparing the efficacy of acupuncture as a therapeutic treatment for improving quality of life in patients with chronic neck pain.

OBJECTIVE

The objective of this selective EBM review is to determine whether or not “Is acupuncture effective in improving the mental health in adults with chronic neck pain?”

METHODS

This systematic review includes three randomized control trials that focused on patients with chronic neck pain who were all aged 25-70y/o. These trials used acupuncture as the intervention comparing it to other treatment options.

Cerezo-Téllez et al and Sun et al compared traditional acupuncture to sham acupuncture. The study conducted by Liang et al compared traditional acupuncture to stretching alone. The three studies measured the impact of acupuncture on the 8 dimensions of health-related quality of life in patients with chronic neck pain. This systematic review analyzes the mental health component.

Data sources were searched using the key words “acupuncture”, “neck pain”, and “quality of life” in PubMed-NCBI. The studies were chosen based on their relevance to my clinical question, if they included patient-oriented outcomes (POEMS), as well as the effect therapy had on the health-related quality of life (HRQoL). All articles were published data in the English language and were peer-reviewed journals. The inclusion criteria included studies that were randomized control trials or controlled trials after 2010. The main exclusion criteria included patients who had received previous acupuncture treatment, had a history of cervical or thoracic vertebra trauma, received surgery on the neck, or had a systematic neurological or skeletal disorder. Summary of statistics reported or used includes mean difference and p-value.

Table 1: Demographics & Characteristics of included studies

Study	Type	# Pts	Age	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Cerezo-Téllez ⁷ (2018)	Double Blind RCT	128	36 +/- 10 years	a) Aged 18-60y/o b) Neck pain ≥ 3 mo, episodes of pain ≥ 30 min, frequency ≥ 1 x/mo c) No acupuncture within 3mo prior to study	a) No history of neck/spinal conditions, neck trauma, any chronic disease, psychologic disorder, or pregnancy	2	2weeks 4 sessions 20min each
Liang ⁶ (2011)	Double Blind RCT	178	48 +/- 15 years	a) Aged 18-60y/o b) Neck pain ≥ 6 mo, frequency ≥ 1 x/mo c) No acupuncture within last 6mo	a) Had received acupuncture in last 6mo b) History of neck conditions, neck trauma, surgery to the neck c) No history of severe medical disease, cancer, or pregnancy	2	3 weeks 9 sessions 20min each
Sun ⁸ (2010)	Double Blind RCT	34	31-66 y/o	a) Aged 18-85y/o b) Neck pain ≥ 1 mo c) No acupuncture within 2wks prior to study	a) No history of neck/spinal conditions, any chronic disease, or pregnancy	1	3 weeks 6 sessions 20min each

OUTCOMES MEASURED

All three studies used the Short Form-36 to measure the health-related quality of life. SF-36v2 is a generic instrument used to assess multidimensional HRQoL, which consists of 36 items encompassed in 8 dimensions.⁷ This scale measures HRQoL using a 36-item self-report measure associated with a physical and psychological scale that questions patients about the impact neck pain has on their day-to-day lives.⁷ Each dimension ranges from 0 (worst possible HRQoL) to 100 (best possible HRQoL).⁷ A higher score indicates a better HRQoL. There are 8 different categories to explore within the questionnaire, however, this systematic review studies the results of the mental health component. For all three studies, the outcomes were assessed before the first treatment as baseline data, immediately after the final treatment as short-term efficacy and at 1 month and 3 months after the final treatment as long-term effectiveness evaluation.

RESULTS

The three studies used for this systematic review analyze the efficacy of acupuncture in improving the mental health of patients with chronic neck pain. The inclusion and exclusion criteria of the studies are outlined in Table 1. Data from these studies were continuous data and could not be converted to dichotomous form. Therefore, results evaluating treatment efficacy could not be calculated.

Cerezo-Tellez et al had a total of 128 participants in their study, with 64 patients in the experimental group and 64 patients in the control group.⁷ Only 2 patients dropped out of the study because they moved away from the city.⁷ Baseline demographics were fairly homogenous except for sex, with more females in the control group (54) than in the experimental group (36).⁷ When the mean change in the score at 12 weeks was compared to baseline scores, within each

group, there was significant difference found in favor of the treatment group ($p=0.03498$).⁷ The mean change from baseline in the experimental group was greater than in the control group, showing that acupuncture was beneficial in improving the mental health in patients to a greater extent than the placebo. There was a small mean change between the two groups, indicating a small treatment efficacy (Table 5). There were no specific adverse events or side effects reported in this study.

Table 2: Cerezo-Tellez et al - comparison of mental health measurement between experimental and control group

	Experimental		Control	
Week 0	Median = 64.6	St. dev = 17.8	Median = 69.1	St. dev = 14.9
12 weeks post treatment	Median = 75.65	St. dev = 1.71	Median = 74.81	St. dev = 1.71
Mean change from baseline	11.05		5.71	

Liang et al had a total of 178 participants in their study, with 88 in the experimental group and 90 in the control group.⁶ 5 patients in the study group and 7 patients in the control group dropped out due to either fear of pain or inconvenient time of appointment, resulting in a total dropout rate of 6.32%.⁶ There were no differences in baseline demographics found between the two groups. There was significant difference between the study group and control group, indicating the study group showed better effectiveness than the control group ($p=0.001$).⁶ The difference between the mean changes was small, indicating a small treatment efficacy (Table 5). Adverse events during treatment included local numbness and aching and fainting during acupuncture.⁶ 7 participants fainted during their treatment, although symptoms were resolved after lying down and drinking water.⁶ 4 participants complained of numbness and aching on the treated points, but symptoms were relieved shortly after the treatment.⁶

Table 3: Liang et al - comparison of mental health measurement between experimental and control group

	Experimental		Control	
Week 0	Median = 63.50	St. dev = 15.43	Median = 59.51	St. dev = 14.41
12 weeks post treatment	Median = 67.13	St. dev = 10.04	Median = 61.64	St. dev = 10.69
Mean change from baseline	3.62		2.13	

Sun et al had a total of 34 participants in their study, with 17 patients in the experimental group and 17 in the control group.⁸ Only 1 participant dropped out of the study due to Chinese herb use.⁸ There were no significant differences found between the two groups in demographics. There was significant difference between the acupuncture group and control group, indicating the study group showed better effectiveness than the control group ($p < 0.05$).⁸ The difference between the mean changes was large, indicating a large treatment efficacy (Table 5). Although the control group shows a greater mean change from baseline compared to the experimental group, it should be taken into account that the baseline scores for the control group were much lower than that of the experimental group. The large change from baseline in the control group may indicate that therapeutic effects on pain are easily influenced by placebo effects. 1 patient in the acupuncture group developed ecchymosed over an acupoint region after the third treatment, which was treated with ice packing and disappeared completely 1 week later.

Table 4: Sun et al - Comparison of mental health measurement between experimental and control group

	Experimental	Control
Week 0	Median = 64	Median = 56
12 weeks post treatment	Median = 72	Median = 68
Mean change from baseline	8	12

Table 5: Summary of results & statistical significance from all 3 studies

Study	Mean change from baseline: Experimental Group	Mean change from baseline: Control Group	Mean difference between the two groups	P-value
Cerezo-Téllez ⁷ (2018)	11.05	5.71	5.34	0.03498
Liang ⁶ (2011)	3.62	2.13	1.49	0.001
Sun ⁸ (2010)	8	12	4	<0.05

DISCUSSION

The studies presented in this systematic review all support that acupuncture can be used to effectively treat patients with chronic neck pain. The long follow up time at 12 weeks post-treatment in all three studies shows that the intervention was effective in not only producing immediate improvement but also long-term improvement of the patient's mental health.

The review has multiple limitations that are worth mentioning. The studies had a relatively small number of patients, with Sun et al only having 34 participants, making it difficult to apply the result to the general population with chronic neck pain. This study should be performed in a larger group of patients in order to have more applicable data. The variability in the duration that patients had experienced pain can be a limitation to this study. In Cerezo-Téllez study, participants had neck pain for >3months. In Liang's study, participants had neck pain for >6months, and in Sun's study participants had neck pain >1month. Particularly, in Sun's study, the inclusion criteria is >1 month. There were no specifics provided on an average duration of pain for each study participant, however, the article uses the term "chronic" when describing the participants pain. Therefore, the reader is uncertain if this article truly evaluated patients with chronic pain based on the definition of "chronic" and the 3-month timeframe.

Acupuncture is becoming more widely popular in America, however finding a practitioner to perform this practice is still limited. It is reported that there are more than 38,000 licensed acupuncture practitioners and more than 10,000 physician acupuncturists in the United States.⁹ Nonphysicians must complete a 4-year master's degree training program accredited by the Accreditation Commission for Acupuncture and Oriental Medicine (ACAOM) in order to be trained in acupuncture.⁹ To become a licensed acupuncturist, a state board exam must be passed.⁹ In some states, additional hours spent in training is required.⁹ The FDA regulates acupuncture needles as medical devices for use by licensed practitioners and requires that needles be sterile, nontoxic, and labeled for single use by qualified practitioners only.¹⁰

Acupuncture has been shown to be most effective in treating pain and nausea and vomiting, with sustained benefits at 12 months in many studies.⁹ Other specific conditions in which acupuncture is used include postoperative pain, headaches, osteoarthritis, low back pain, TMJ pain, chronic shoulder pain, peripheral neuropathy, acute zoster pain, plantar heel pain.⁹ Acupuncture is generally safe when performed by an experienced, well-trained practitioner using sterile needles.¹⁰ When improperly performed, serious complications can result, however, this is extremely rare. Adverse events of acupuncture are reported to be as low as 1 in 100,000.⁹ Some minor side effects that are possible are presyncope, syncope, and drowsiness, all of which can be prevented by having patients lie flat on the table and monitoring them during their initial visit.¹⁰

CONCLUSION

In conclusion, all three RCTs demonstrated that acupuncture treatment is an effective therapy in improving the mental health of patients with chronic neck pain. A major benefit of using acupuncture over pharmacologic medications is the minimal side effects and safety that

acupuncture provides. For future studies, it would be interesting to see the comparison of acupuncture treatment in patients with neck pain >6months versus patients with neck pain for a shorter time period of 1-3months. It would also be beneficial to study whether a longer or shorter duration of treatment provides patients with the greatest improvement.

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