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Effect of Acupuncture on Acupoint Stomach 36 (ST36) in Pain Management of Osteoarthritis Knee–A Pilot Study

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Abstract

Background: Osteoarthritis of the knee joint is a most common type of joint disease. Acupuncture is one of the most important traditional and ancient therapeutic techniques. Zusanli (ST36) is an important acupuncture point; used for treating pain.

Objectives: The present study is to know the effect of acupuncture on single point ST36 is effective in treating patients with KOA.

Methods: About 60 subjects were randomly assigned aged between 33-85 years who were diagnosed with primary knee osteoarthritis. The intensity of the knee pain was recorded by using a Visual Analog Scale (VAS). Needling ST 36 point with manual stimulation for 45 minutes for 10 days brings the most significant result in relieving pain.

Results: The result shows that after applying the "t" test, we are to compare between the pre and post score of pain. Before the treatment, the mean pain level recorded by the patients was 6.1 ± 0.15. After ST36 single needle acupuncture for ten days, the mean pain level was 2.23 ± 0.14. Pain reduction was very significant.

Conclusion: Evidence-based studies support the effectiveness of acupuncture on the point that ST36 is applicable as a non-pharmacological method for controlling pain in OA knees. The current study supports the research hypothesis that needling on the point ST36 can be easily implemented to reduce pain and increases the range of motion, thereby improving the activities of daily living. On the basis of the findings of the studies reviewed, acupuncture should be considered a viable adjunct or an alternative treatment of knee pain associated with osteoarthritis of the knee.

Keywords: Acupuncture; ST36; Knee osteoarthritis; Acupuncture point ST36; OA

Introduction

Osteoarthritis of the knee joint is a degenerative joint disease in which the cartilage of the knee joint wears out or is damaged. When this happens, the knee joint bones rub each other with less shock–absorbing benefits of the cartilage that may result in pain, swelling, stiffness, decreased movement of the joint, and at the last stage, there may be the formations of the bone spur in the knee joints [1,2].

Osteoarthritis of the knee increases in prevalence with age and gender, more common in females than in males. According to many epidemiological studies, osteoarthritis of the knee is the second most common rheumatic problem with a prevalence of 22% to 39% in India [3].

However, the detailed molecular mechanisms of KOA initiation and progression remain poorly understood, and currently, there are no interventions available to restore degraded cartilage or decelerate disease progression. But around the world, several different types of medication are used for treating KOA, like oral pain relievers, topical pain relievers, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), corticosteroids, and cymbalta. In severe cases of KOA, the physician advises going for arthroplasty to replace or repair a damaged knee joint. Current treatment options for knee osteoarthritis have limited effectiveness and potential adverse side effects. But physical activity strengthens the muscles around the knee joints, and it may help relieve stiffness.

In recent times, acupuncture is believed to be more effective in treating pain. Acupuncture is one of the most ancient and characteristic therapeutic techniques of Chinese medicine. The word acupuncture comes from the Latin word "Acus-needle"; "Punctura-to penetrate". Acupuncture relieves pain through various mechanisms. The main mechanisms are thought to relieve pain through the gate-control mechanism or the release of neurochemicals.

The acupuncture point ST36 is one of the six important distal points and is also called Zusanli [4]. It is located one finger breadth lateral to the inferior (distal) end of the tibial tuberosity. Needling this point

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with manual stimulation for 45 minutes for 10 days brings the most significant result in relieving pain, which represents the most effective and low-cost treatment in treating KOA with grades 2 and 3.

Aim and objective

The main aim and objective of this study are to know the effect of acupuncture on Single Point ST36 is effective in treating patients with KOA.

Materials and Methods

Type of the design

A single-arm clinical trial.

Study setting

Subjects were recruited from the out-patient Departmentof Nandha Naturopathy and Yoga Medical College and Hospital, Erode, Tamil Nadu, India.

Study period

Study was conducted from January 2022 to November 2022.

Study population

For investigating the outcomes of ST36 acupuncture on pain in knee osteoarthritis patients. The sample consisted of patients (n=60) who were diagnosed with primary knee osteoarthritis and visited our hospital. All participants provided written informed consent.

Inclusion criteria

Participants in the study would be women and men aged between 33-85 years with clinical knee osteoarthritis according to American College of Rheumatology Clinical Criteria and Kallgren and Lawrence (KL) radiographic osteoarthritis grade 2 and 3 (mild to moderate radiographic osteoarthritis).

Exclusion criteria

Volunteers excluded who are present with, Severe knee osteoarthritis according to the KL classification (grade 4), other known major musculoskeletal impairments in the lower extremities or the back or prostheses in any joint of the lower extremities, known serious coronary heart diseases or cancer, body mass index >35, scheduled for surgery in any joint, known mental or psychological diseases, known drug abuse, contraindications for MRI. Also, excluded were those who miss two consecutive sessions without justification, as well as volunteers who are absent from 10% of the intervention sessions.

After satisfying the inclusion criteria, recruitment of the patients with initial screening will be collected covering, personal and socio-economic data, lifestyle, medications, identification of the existence of other diseases, anthropometric assessments, and baseline blood pressure. The study was conducted over a period of 10 days. Before starting the treatment protocol, we recorded pre-assessment dates of pain. Then we underwent ST36 single-needle acupuncture for ten days.

Assessment instrument

The intensity of the pain was recorded by using a Visual Analog Scale (VAS). This consists of a 10 cm line containing numbers ranging from 0 to 10, where 0 represents “no pain”, and 10 represents “worst possible pain.

Results

The results, after applying the “t” test, are to compare between the pre and post score of pain (Tables 1 and 2). Before the treatment, the mean pain level recorded by the patients was 6.1 ± 0.15. After ST36 single needle acupuncture for ten days, the mean pain level was 2.23 ± 0.14. The observed reduction in pain was statistically significant (Figure 1).

Table 1: T-test.

	N	Mean	Std. deviation	Std. error mean
VAS Day 1	60	6.1667	1.20966	0.15617
VAS Day 10	60	2.2333	1.09493	0.14135

Table 2: The “t” test, are to compare between the pre and post score of pain.

	Test value=0					
	t	df	Sig. (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
VAS Day 1	39.488	59	0	6.16667	5.8542	6.4792
VAS Day 10	15.799	59	0	2.23333	1.9505	2.5162

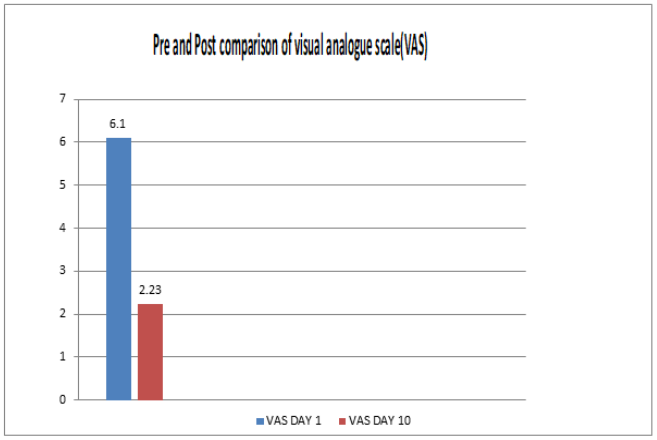

Figure 1: Pre and post-comparison of Visual Analogue Scale (VAS).

Discussion

The study aimed to examine the effects of acupuncture on stomach 36 (ST 36) in pain management of knee osteoarthritis. In addition, participants reported improved range of motion of the knee joints, relaxation effects, emotional wellbeing and overall improved quality of life. At the end of the study, the subjects show significant difference in pain. Before treatment the pain level recorded by the subjects was 6.1 ± 0.15 and after acupuncture treatment the mean pain level was 2.23 ± 0.14. The observed reduction in pain was statically significant. On the basis of the findings of the studies reviewed, acupuncture should be considered a viable adjunct or alternative treatment of knee pain associated with osteoarthritis of the knee. In Rats with Adjuvant-Induced Arthritics (AIA) were treated with Manual Acupuncture (MA) at Zusanli (ST36). Joint edema and paw withdrawal latency were monitored to observe the effects on inflammation and adaptive immune cytokines were dynamically regulated by MA [5]. Acupuncture at ST36 has clinical benefits in relieving inflammation through several mechanisms. One of them is through activation of the vagus nerve, macrophage polarisation, mitogen-activated protein kinase signalling pathway, the cholinergic anti-inflammatory pathway. The current study, designed to gather data on the research hypothesis, did not use a control group. The selection of additional patients combined with randomization to groups would have required substantial additional resources. However, future studies on acupuncture in an acute care setting may benefit from the addition of a control group. ST36 reduced both serum levels of TNF-α and IL-10, which were abnormally increased by systemic inflammation. Also, acupuncture reduced D-Lactic Acidosis (D-LA) and Double Amine Oxidase (DAO) concentration in serum, which means acupuncture may strengthen the intestinal barrier. Since the pre-splenectomy was conducted, the anti-inflammatory effect of acupuncture disappeared; this study showed that in the mechanism of acupuncture stimulation at ST36, the spleen plays an important role in regulating systemic inflammation [6,7]. Stimulation of ST36 leads to the activation of the dorsal motor nucleus of the vagus (DMV), and the activated DMV stimulates the chromaffin cells of the adrenal gland through the vagal adrenal axis. The chromaffin cells release catecholamine, which has an anti-inflammatory property. It's well-established that catecholamine's which regulate inflammatory responses derive from the adrenal medulla and from pre-synaptic neurons [8].

Conclusion

Evidence-based studies support the effectiveness of acupuncture on the point that ST36 is applicable as a non-pharmacological method for controlling pain in OA knees. The current study supports the research hypothesis that needling on the point ST36 can be easily implemented to reduce pain and increases the range of motion, thereby improving the activities of daily living.

Conflict of Interest

The authors declare no conflict of interest.

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