Original Article

Acupuncture versus Homeopathy as A Complementary Therapy in Patients with Knee Osteoarthritis

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ABSTRACT

Background: Osteoarthritis of the knee is a major cause of disability with treatment focused only on control of symptoms. Despite the popularity of both acupuncture and homeopathy, evidence of their efficacy for treatment of osteoarthritis remains controversy. **Aim of the Work:** To assess the efficacy of Acupuncture compared with Homeopathy and with the usual conservative treatment (analgesics and physiotherapy) in patients with knee osteoarthritis. **Patients and Methods:** Seventy-five patients who had had chronic pain for at least 6 months due to osteoarthritis of the knee (American College of Rheumatology [ACR] criteria and Kellgren-Lawrence score of 2), all continue on their conservative therapy remained unchanged all-through the study. They were divided into three groups; Group I (Acupuncture group): Included 25 patients who were subjected to acupuncture at the standardized acu-point stimulation treatment without electrical stimulation. Sessions were done twice weekly from base line visit to week six. Group II (Homeopathy group): Included 25 patients who were given oral doses of homeopathic remedies that were commonly used for the treatment of osteoarthritis (Arnica Montana, Ruta graveolans and Rhus toxicodendron). Group III (Control group): Included 25 patients who continued only on their pre-study medications .Pain intensity on visual analog scale (VAS), the Health Assessment Questionnaire (HAQ) score and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score were recorded for each patient before the beginning of treatment, during each visit and at the end of the sessions. The results were statistically analyzed. **Results:** Pain has improved statistically on both VAS and pain subscale of the WOMAC in group I. Also, the number of tender points decreased significantly and there was significant decrease in the number of patients receiving analgesics for pain control at the end of the study ($p<0.05$). In addition, a statistically significant improvement in knee function was detected ($p<0.05$) on the total WOMAC score for knee osteoarthritis and both the function and stiffness subscales of the WOMAC, in addition a statistically significant decrease in knee swelling (knee circumference) was detected in this group, as well as the patient quality of life assessed by the HAQ score in comparison to the control group. There was a statistically significant improvement in the total WOMAC score, both VAS and pain subscale of the WOMAC, number of tender points in group II. Moreover, a significant decrease in the number of patients receiving analgesics for pain control was reported in this group ($p<0.05$).However, the decrease in knee swelling assessed by the knee circumference was statistically insignificant in this group. In addition, we found that the improvement of pain and function was statistically significant ($p<0.05$) in comparison to the control group (group III). **Conclusions:** Both Acupuncture and Homeopathy were effective in reducing pain and improving function of the knee but acupuncture was significantly more effective than homeopathy. Moreover, Acupuncture significantly decreased the knee circumference while homeopathy did not decrease it significantly. **[Egypt J Rheumatology & Clinical Immunology, 2014; 2(1): 45-51]**

Key Words: Osteoarthritis, Knee, Acupuncture, Homeopathy.

INTRODUCTION

Osteoarthritis (OA) is the most common type of arthritis in humans. It is a major cause of pain and disability and has significant consequences for public health. The burden of OA is expected to increase with aging of the population and the present obesity epidemic.[1] The hip and knee are two commonly affected joints, having a significant impact on walking and other daily activities. The prevalence of OA is on the rise, and this trend is expected to continue.[2]

Optimal management of patients with OA requires a combination of non-pharmacological and pharmacological therapies.[3] The pharmacological modalities of treatment including acetaminophen, oral NSAIDs, topical NSAIDs, Tramadol and intra-articular injections of corticosteroids. While the non-pharmacological modalities including: education, aerobic and aquatic exercises, weight reduction, walking aids, footwear, and complementary therapies

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like thermal therapy, Tai Chi programs and, transcutaneous electrical stimulation and acupuncture.[4] The pharmacologic therapies used in treatment of OA may often cause unwanted and dangerous side effects.[5]

Many studies have documented that acupuncture has a beneficial effect when treating many diseases and painful conditions, and therefore is thought to be useful as a complementary therapy or to replace generally accepted pharmacological intervention.[6] It is proposed that acupuncture produces its effects by the conduction of electromagnetic signals at a greater-than-normal rate, thus aiding the activity of pain-killing biochemicals , such as endorphins and immune system cells at specific sites in the body.[7] In addition, acupuncture may alter brain chemistry by changing the release of neurotransmitters and neurohormones and affecting the parts of the central nervous system related to sensation and involuntary body functions, such as immune reactions and processes whereby a person's blood pressure, blood flow, and body temperature are regulated.[8]

Homeopathy is a system of medicine which involves treating the individual with highly diluted substances, given mainly in tablet form, with the aim of triggering the body's natural system of healing. [9] Homeopathy is based on the principle that an illness can be treated 'like with like', that is, a substance which causes symptoms when taken in large doses, can be used in small amounts to treat those same symptoms. The major difference between de-sensitization and Homeopathy is that with homeopathic medicines the substances are used in ultra-high dilutions, which makes them non-toxic.[10] The use of homeopathy is widespread worldwide and growing. Its use by those with chronic problems such as chronic pain, arthritis, and neurodegenerative diseases is extensive.[11]

The aim of the present study was to evaluate the efficacy of Acupuncture compared with Homeopathy and with the usual conservative treatment (analgesics and physiotherapy) in patients with knee osteoarthritis.

PATIENTS AND METHODS

Seventy five (75) Egyptian patients with knee osteoarthritis in one or both knees, diagnosed according to American College of Rheumatology (ACR) criteria[12], who had chronic pain for at least 6 months, were included in this study. Staging of the knee OA was graded according to (Kellgren-Lawrence grade 2).[13]

The patients were recruited from Ain Shams University Hospital rheumatology outpatient clinics, and the Outpatient Acupuncture Clinic of the Medical Service Unit of the National Research Centre, Cairo, Egypt. A written informed consent was obtained from all subjects participating in this study, after explaining its nature in details.

Patients with other diseases affecting the knee, neurologic and psychiatric diseases, severe coagulopathy, pregnancy, or previous acupuncture treatment for osteoarthritis, or had underwent knee surgery or intra-articular steroid injection within four weeks preceding the study, together with cases of arthritis due to other inflammatory condition or patients experiencing other medical causes of pains rather than knee OA that may interfere with our results, were excluded from this study.

All patients were subjected to:

- Full medical history and thorough clinical examination (general, systemic and musculoskeletal). Special emphasis was given to knee examination and knee circumference.
- The body mass index (BMI): was calculated for each patients using the following equation: BMI= Weight\ (Height)^2 with weight in kilograms and height in meters.[14]
- Standard laboratory investigations were done including: complete blood picture (CBC), Erythrocyte sedimentation rate [ESR], C-reactive protein [CRP], kidney function (BUN- serum creatinine), liver enzymes (AST-ALT), complete lipid profile, and urine analysis.
- Plain X-ray of both knees (antro-posterior and lateral views) to determine the grade of knee osteoarthritis.[13]
- The patients were subdivided into three groups. All the patients in the three groups continued on the same dose and type of analgesic medications used before the study (including paracetamol or NSAID) according to patients` needs.
- Group I (Acupuncture group): Included 25 patients who were subjected to acupuncture at the standardized acupoint stimulation treatment without electrical stimulation (Table 1). Sessions were done twice weekly from base line visit to week six. All acupuncture treatments for a given patient were completed by the same physician. The patient first laid supine with a pillow under both knees, retained needles for 15-20 minutes. The acupuncture needles used for treatment were 3 cm, 30 gauge solid disposable filiform stainless steel. The depth of needle insertion varied with thickness of the skin and subcutaneous fatty tissues at the site of the acupuncture points; it was usually 1 to 1.5cm. Manual acupuncture treatment was given for 10 minutes for each site.

Table 1. Standardized acupoints stimulation treatment (Berman et al., 1999).[15]

Acupoints	Location	Needle manipulation
Stomach 35 (ST35) (Dubi)	With knee flexed, point at lower border of patella, in a depression lateral to the patellar ligament (the point is the lateral foramen of the patella)	0.5 to 1 cun obliquely in medial direction
Stomach 36 (ST36) (Zusanli)	3 cun below ST35, one finger breadth from anterior crest of tibia, on tibilalis anterior muscle.	Vertical 1 to1.5 cun
Gall bladder 34 (GB34) (yanglingquan)	On a depression anterior and inferior to the small head of fibula.	Vertical 1 to1.5 cun
Spleen 9 (SP 9) (yinlingquan)	On the lower border of the medial condyle of tibia, with the level of tibial tuberosity, in the depression posterior and inferior to medial condyle of tibia. 2 cun below the patella	Vertical 1 to1.5 cun
Spleen 10 (SP 10) (xuehai)	With knee flexed 2 cun above mediosuperior border of patella, on the bulge of medial portion of quadriceps femoris muscle (vastus medialis).	Vertical 1 to1.5 cun

N.B.: 1 Cun is equal to the space between distal and proximal inter-pharyngeal joint on the middle finger.

Group II (Homeopathy group): Included 25 patients who were given oral doses of homeopathic remedies of:

- Arnica Montana 30 c (5 drops in 30 ml water three times daily). This remedy was concerned specially with patients complained of pain.
- Ruta graveolans 30 c, Rhus toxicodendron 30 c (5 drops in 30 ml water once daily). These two remedies were concerned specially with patients who complained of stiffness.

The original form was in (pellets) prepared in National Research Centre, the pellets dissolved in 250 ml sterile water. The dose is given oral or sublingual of oral solution for 2 weeks, then patients come back for follow up the degree of pain and degree of improvement of knee function, then repeated same dose for another 2 weeks. Patients were not allowed to eat, smoke, and drink tea, coffee, or any food with special flavor half an hour before and after taking the drug. They were not allowed to put the drug in high temperature or in the sun light, and not beside any other drug.

Group III (Control group): Included 25 patients who continued only on their pre-study medications (NSAID and paracetamol).

Pain intensity on visual analog scale (VAS)[16], the Health Assessment Questionnaire (HAQ) score[17], and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score [18], were recorded for each patient before the beginning of treatment, during each visit and at the end of the sessions.

Statistical Analysis

Analysis of data was done by an IBM compatible computer using SPSS (statistical program for social science software version 12) as follows: Description of quantitative variables as mean, SD and range. Description of qualitative variables as number and percentage. Chi-square test was used to compare qualitative variables between groups (%). The unpaired *t*-test was used to compare two groups regarding quantitative variables. One way ANOVA test (analysis of the variance) was used to compare more than two groups as regard quantitative variable. Paired t-test was used to compare variables in the same group before and after.

P value $\leq$ 0.05 was considered statistically significant, p>0.05 was statistically insignificant and p$\leq$0.001 was considered highly statistically significant.

RESULTS

Seventy-five osteoarthritis patients were included in the study (61 females and 14 males). Their age ranged from 44 to 57 years.

There was statistically significant difference (P <0.001) between the three studied groups at the end of the study as regards: Pain on VAS, stiffness and physical function subscales of WOMAC, and the HAQ score. In contrast, there was non-significant difference between the three groups regarding the knee circumference (by one way ANOVA test) (Table 3).

There was statistically significant difference at the end of week 6 compared to the time of the beginning of the study in both the acupuncture and the homeopathy groups as regards: Pain on VAS of Pain, stiffness and physical function subscales of WOMAC, and the HAQ score (P<0.001). Only in the acupuncture group, there was significant difference regarding the knee circumference (by paired t-test test) (Table 4).

Table 2. Demographic data of the different studied groups.

Variables	Acupuncture group I (n=25)	Homeopathy group II (n=25)	Controls group III (n=25)
Age (years) Mean±SD	49±7.6	51±6 .0	50.5±5.2
BMI (kg/m^2) Mean±SD	31.7±5.8	30.9±3.O	31.3±5
Gender			
Male no (%)	6(24%)	5(20%)	3(12%)
Female no (%)	19(76%)	20(80%)	22(88%)

Data are expressed as mean ± standard deviation or number with percent within parenthesis; ***BMI*** body mass index.

Table 3. Comparison between the outcomes of the studied groups at the end of week 6.

Characteristic	Acupuncture group I (n=25) Mean±SD	Homeopathy group II (n=25) Mean±SD	Controls group III (n=25) Mean±SD	P-value, 1-way ANOVA	group I vs. group II	group I vs. group III	group II vs. group III
VAS	2.74±0.98	5.16±0.79	8.90±1.03	<0.001*	<0.001*	<0.001*	<0.001*
WOMAC total	25.04±0.62	34.00±0.99	41.81±0.93	<0.001*	<0.001*	<0.001*	<0.001*
WOMAC pain	4.72±0.62	8.04±0.99	12.06±0.93	<0.001*	<0.001*	<0.001*	<0.001*
WOMAC stiffness	0.35±0.62	2.06±0.99	4.06±0.93	<0.001*	<0.001*	<0.001*	<0.001*
WOMAC physical function	20.16±0.62	24.92±0.99	25.88±0.93	<0.001*	<0.001*	<0.001*	0.305
HAQ score	0.94±0.45	1.68±0.48	1.84± 0.37	<0.001*	<0.001*	<0.001*	0.403
Knee circumference	45.19±1.90	45.30±1.89	44.27±3.09	0.057	-	-	-

Data are expressed as mean ± standard deviation; ***ANOVA*** analysis of variance; ***VAS*** visual analogue scale for pain; ***WOMAC*** Western Ontario and McMaster University Osteoarthritis Index; ***HAQ*** health assessment questionnaire.

Table 4. Comparison between the means of the studied parameters (before and after treatment) of the studied groups

Characteristic	Acupuncture group I (n=25)			Homeopathy group II (n=25)			Controls group III (n=25)		
	Before Mean±SD	After Mean±SD	P-value	Before Mean±SD	After Mean±SD	P-value	Before Mean±SD	After Mean±SD	P-value
VAS	9.38±0.81	2.74±0.98	<0.001	9.66±0.62	5.16±0.79	<0.001	9.50±0.50	8.90±1.03	>0.05
WOMAC total	43.40±0.49	25.04±0.62	<0.001	44.20±0.41	34.00±0.99	<0.001	43.28±0.50	41.81±0.93	>0.05
WOMAC pain	12.82±0.51	4.72±0.62	<0.001	13.52±0.51	8.04±0.99	<0.001	13.02±0.51	12.06±0.93	>0.05
WOMAC stiffness	4.64±0.49	0.35±0.62	<0.001	4.42±0.41	2.06±0.99	<0.001	4.30±0.50	4.06±0.93	>0.05
WOMAC physical function	26.08±0.70	20.16±0.62	<0.001	26.58±0.64	24.92±0.99	<0.001	25.94±0.62	25.88±0.93	>0.05
HAQ score	2.01±0.28	0.94±0.45	<0.001	1.80±0.00	1.68±0.48	0.003	1.98±0.00	1.84±0.37	0.051
Knee circumference	45.88±1.97	45.19±1.90	<0.001	45.51±1.82	45.30±1.89	0.054	44.40±3.23	44.27±3.09	0.052

Data are expressed as mean ± standard deviation. ***VAS*** visual analogue scale for pain; ***WOMAC*** Western Ontario and McMaster University Osteoarthritis Index; ***HAQ*** health assessment questionnaire.

Table 5. Comparison between the studied groups (before and after treatment) regarding the number of patients using analgesics and the number of patients having tender points using the Chi square test.

Variable		Acupuncture group I (n=25)	Homeopathy group II (n=25)	Controls group III (n=25)	X^2	P-value
Patients using analgesics	Before no (%)	25(100%)	25(100%)	25(100%)	144	>0.05
	After no (%)	3(12%)	10(40%)	25(100%)	59.83	<0.001
Patients having tender points	Before no (%)	25(100%)	17(68%)	17(68%)	7	>0.05
	After no (%)	5(20%)	6(24%)	17(68%)	30	<0.001

Data are expressed as number with percent within parenthesis.

DISCUSSION

Osteoarthritis is the most common joint disease, with many patients having persistent disability due to pain and stiffness. Analgesic and anti-inflammatory therapy are limited by side effects and not all patients are adequately controlled with life style changes.[19] In cases in which pharmacological treatment is ineffective and the criteria for surgery are not fulfilled, or when surgery is refused by the patient, alternative methods for pain relief such as Acupuncture and Homeopathy can be considered.[5]

In this study, pain has improved statistically on both VAS of pain and pain subscale of the WOMAC in group I (acupuncture treated group). The number of tender points decreased significantly, and moreover, there was significant decrease in the number of patients receiving analgesics for pain control ($p<0.05$). This finding was in agreement with a pilot study by Berman et al., where among 12 patients with knee osteoarthritis, pain showed statistically significant improvement with acupuncture.[20] Tukmachi et al., documented pain relief on applying acupuncture on 30 patients with symptomatic knee osteoarthritis.[19] Similarly, in another study that was conducted on 736 patients who received acupuncture for their knee osteoarthritis, a statistically significant improvement in pain was observed.[21]

In our thesis, a statistically significant improvement in knee function was found in group I ($p<0.05$) on the total WOMAC score for knee osteoarthritis and both the function and stiffness subscales of the WOMAC. In addition, a statistically significant decrease in knee swelling (knee circumference) was detected in this group. These findings agreed with Dai et al., where among 49 cases who completed their study, acupuncture affected both the VAS and the WOMAC in a significant manner.[22] Tukmachi et al., found that both manual and electro-acupuncture showed a significant improvement in the WOMAC pain and stiffness scores and the VAS score, either alone or as an adjunctive therapy to their symptomatic medications.[19] Also, acupuncture caused a decrease swelling and improved range of motion in patients with knee osteoarthritis.[20]

In the present study, the acupuncture group showed significant decrease in pain intensity (VAS scores and pain subscale of WOMAC score) and better improvement in knee function (both stiffness and function subscales of WOMAC score), as well as the patient quality of life assessed by the HAQ score in comparison to the control group (patients receiving their usual analgesics and\ or NSAIDs).

Interestingly, a significant decrease in the number of patients that continued on their usual medications was observed in the acupuncture group compared to the control group. This occurred in agreement with Berman et al., who found that patients on acupuncture improved on both WOMAC and Lequesne indices compared to those who received standard treatment alone.[15]

The results of the present study are also consistent with the findings of Vas et al., who compared acupuncture plus diclofenac with sham acupuncture plus diclofenac and found that the former treatment was more effective in pain relief, stiffness reduction, physical function improvement and had better quality of life. Moreover the true acupuncture group exhibited a significant reduction of diclofenac consumption during treatment period.[23]

A more recent single blinded, three armed, sham controlled study on 120 patients with knee osteoarthritis concluded that acupuncture as adjunctive therapy to pharmacological therapy with etoricoxib is more effective than sham acupuncture plus etoricoxib or etoricoxib alone in reducing pain and improving knee function after eight weeks and the benefits persisted for at least one month after the completion of treatment.[24]

In the present study, the homeopathy treated group (group II) showed a statistically significant improvement in pain on both VAS and pain subscale of the WOMAC and significant decrease in the number of tender points ($p<0.05$). Moreover, a significant decrease in the number of patients receiving analgesics for pain control was reported in this group ($p<0.05$). Also, a statistically significant improvement in knee function was noticed in this group ($p<0.05$) on the total WOMAC score for knee osteoarthritis and both the function and stiffness subscales of the WOMAC. However, the decrease in knee swelling assessed by the knee circumference was statistically insignificant in this group. In addition, we found that the improvement of pain and function was statistically significant in comparison to the control group (group III).

Our results go in agreement with the results of a previous controlled, double-blind clinical study that proved the clinical efficacy of Zeel compositum medication which contains (Arnica montana 4X, Rhus toxicodendron 4X, Sanguinaria canadensis 4X, Solanum dulcamara 5X and Sulphur 8X) to be equivalent to that of diclofenac in relieving pain of osteoarthritis of the knee, and has no dangerous side effects.[25] Another study by Binesser et al., who examined the effectiveness of Zeel versus Celebrex and Vioxx (cox-2 inhibitors) in 592 patients with osteoarthritis of the knee and found that after six weeks of treatment, scores indicated that the homeopathic medication and the cox-2 inhibitors were equally effective. Moreover, the test medication (Zeel) scored significantly higher regarding to tolerability ($p<0.001$) than the cox-2 inhibitors and costs less.[26]

Different studies had documented the efficacy of Arnica gel preparation in osteoarthritis: Knuesel et al. investigated the efficacy and safety of Arnica Montana fresh plant gel applied twice daily in mild to moderate osteoarthritis (OA) of the knee. After 6 weeks, significant decreases in median total scores on the WOMAC by 12.6, (P<0.0001), and decreased VAS score by 57% (P<0.005).[27] Similarly, Wriding et al., compared the effects of ibuprofen (5%) and arnica gel preparations in patients with osteoarthritis of inter-phalangeal joints of the hands. The mean of pain (VAS), number of tender joints , duration of morning stiffness and hand function all showed significant improvement.[28] Also, the results of the study conducted by Ross in 2008 that compared the efficacy of arnica gel with non steroidal anti-inflammatory gel in osteoarthritis of the hand showed that Arnica gel and ibuprofen gel were similar in their effect on osteoarthritis of the hands regarding hand function, pain, morning stiffness and number of tender joints with significant decrease in median total scores on the WOMAC by (P<0.0001), also decreased VAS score (P<0.005).[29]

In conclusion, both Acupuncture and Homeopathy were effective in reducing pain and improving function of the knee but acupuncture was significantly more effective in both. Moreover, Acupuncture significantly decreased the knee circumference while Homeopathy did not. To our present available knowledge, this is the first study to compare the efficacy of acupuncture versus homeopathy in treatment of knee osteoarthritis. Further studies on in a broad spectrum of the representative population is recommended.

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