EFFECT OF ACUPRESSURE VERSUS PHYSIOTHERAPY ON SYMPTOMS OF OSTEOARTHRITIS KNEE: A COMPARATIVE STUDY

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Abstracts: ***Objectives:*** To determine the effect of acupressure and physiotherapy in reducing symptoms of osteoarthritis knee with comparison of the effectiveness of acupressure and physiotherapy. ***Methods:*** *60* Patients with symptomatic osteoarthritis of the knee were randomized to two treatment groups. Group one had acupressure and group second received physiotherapy. Patients in both groups were taking their stable dose of NSAIDs. Interventions: Patients receiving acupressure or physiotherapy were treated twice weekly over two months. Patients were assessed before treatment and after two months treatment, using visual analogue pain scale (VAS), oxford knee score (OKS) questionnaire and Western Ontario and McMaster (WOMAC) questionnaire for osteoarthritis knee. ***Results:*** After acupressure and physiotherapy sessions of two months there was a statistically significant ($p<0.05$) drop in the VAS and WOMAC pain scores, and very significant ($p<0.01$) drop in OKS scores for both treated groups. There were no significant differences between the two groups at intergroup comparison. ***Conclusions:*** We conclude that acupressure and physiotherapy are effective and adjunctive therapy with medication to relieve the symptoms of knee osteoarthritis. In present study we cannot demonstrate any superiority in between acupressure and physiotherapy.

Key Words: Acupressure, knee, osteoarthritis, physiotherapy.

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Introduction:

Osteoarthritis (OA) is a degenerative joint disease that mostly affects the cartilage of the knee joint. OA causes the cartilage to fray, wear or disappear completely. OA of the knee is the most common type of OA and its prevalence is rising in parallel with the increasing age of the population. Pain and functional limitations are the primary clinical manifestation of osteoarthritis of the knee. OA of the hip or knee is particularly disabling because it limits ambulation, but the affliction also strikes the hands, and the feet with the same destructive joint process. The end point of the OA disease process is the total loss of joint cartilage in the affected area and the need for joint replacement[1]. Incidences are reported globally approximately 250 million people have osteoarthritis of the knee (3.6% of the population) [2].

Osteoarthritis (OA) is the second most common rheumatologic problem and is most frequent joint disease with prevalence of 22% to 39% in India[3, 4]. Long term use of oral NSAIDs is discouraged and studies shows that patients generally do not like taking drugs[5]. People with osteoarthritis of knee want non-pharmacological options for pain relief and often choose alternative therapies.

Acupressure is an ancient healing art using the fingers to gradually press key healing points, which stimulate the body's natural self-curative abilities. Acupressure was developed in Asia over 5,000 years ago. Acupressure releases tension, increases circulation, reduces pain, and develops spirituality[6] and vibrant health.

Berman and colleagues have recently investigated the effectiveness of acupuncture for patients with OA of the knee in a randomized trial[7]. This study found acupuncture to be of benefit as an adjunctive therapy. A

review of non pharmacological therapy for OA has emphasized the need for continued research in this field.

Physiotherapy (Strengthening exercise) is commonly recommended. Patients with knee OA tend to have reduced muscle strength as a consequence of reductions in physical activity and pain inhibition. It has proven that exercise based physiotherapy is more important than usual primary care for older adults with knee pain[7].

Slemenda C et al. (1997)[9] conducted a study on 462 volunteers, 65 years of age or older and concluded that quadriceps muscles weakness may be present in patients who have osteoarthritis but do not have knee pain or muscle atrophy, this suggest that the weakness may be due to muscle dysfunction. The data are consistent with the possibility that quadriceps weakness is a primary risk factor for knee pain, disability and progression of joint damage in persons with osteoarthritis of the knee. Quadriceps exercise increases strength and it may have beneficial effects on pain and function.

International guidelines for the assessment of therapies for OA have been published and were followed in this study. The visual analogue scale (VAS) for pain, oxford knee score (OKS) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) are validated methods for monitoring symptom changes in OA.

Aims and objectives:

The aim of this study was to determine the effect of acupressure and physiotherapy in reducing symptoms of osteoarthritis knee, and to compare the effectiveness of acupressure and physiotherapy in patients of osteoarthritis knee.

Material and Methods:

After taking approval of ethical committee we recruited patients for this study from OPD of orthopaedic department, JLN hospital, Ajmer (Rajasthan) for duration of September 2013 to December 2013. Patients who had a history of knee OA for more than six months were recruited. They were invited to take part in the study and given a full clinical examination, and their medical records were fully reviewed. Those who fulfilled the selection criteria were then randomly assigned to one of three treatment groups. Patients with bilateral knee involvement were asked to indicate which the more painful knee was, and this one was treated.

Inclusion Criteria

Patients selected from age group 40 to 70 years with no gender discrimination. BMI <35 kg/m^2, having knee pain, taking stable treatment with NSAIDs and analgesics in the previous month, having good to satisfactory general health and are willing to complete the study protocol.

Exclusion Criteria

1) *Subject having intra-articular corticosteroid injections in the knee joint 8 weeks prior the study.*
2) Subject had any knee injury that preventing him/her to perform physical exercise.
3) Subject had knee replacement in the past.
4) Subject with an autoimmune disease.

Randomisation

The study group was allotted on the basis of their OPD Nos. Even number for acupressure and Odd number for physiotherapy.

Treatment groups

After taking written consent 70 patients were registered. 10 were excluded out of which 6 were excluded because of not meeting inclusion criteria and 4 were excluded because of denying in taking part. Total 60 numbers were categorized into two groups with diagnosed osteoarthritis of knee either on basis of radiological findings with clinical sign and symptoms. Group 1 received acupressure therapy with medication in the acupressure centre at Ajmer. Patients in group 2 were given physiotherapy with medication in the JLN Hospital, Ajmer.

1. Acupressure Procedure

Thirty patients were given acupressure treatment at the *"Maharishi Dayanand Acupressure and Vaikalpic Chikitsa Shodh Sansthan, Ajmer."*The expert presses the acupressure points (acu-points) selected according to standardized acupressure formulae, traditionally used for treatment of osteoarthritis of the knee. A combination of local and distal classical chineseacu-points were used in supine position [SP-9, ST 36, LR 3, GB 34, Xiyan (eyes of the knee)], in prone position (BL40, BL57), and in sitting position (L14)(Figure)

Pressure applied on these acu-points by the fingers (manual stimulation), some special wooden objects of acupressure and by the battery operated vibrator (electro stimulator). Pressure applied on these acu-points for 15 to 20 seconds, twice a week for two months.

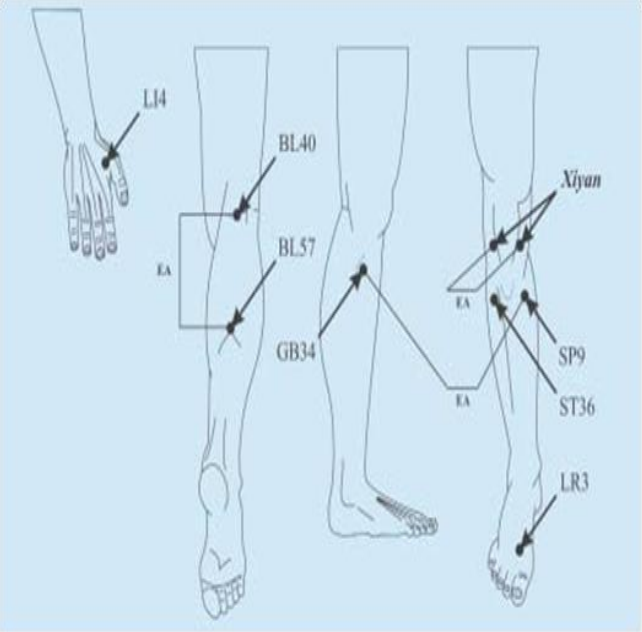

Figure: Showing the acu points

2. Physiotherapy Procedure:

Thirty patients were given physiotherapy treatment for two months one hour daily twice a week. It was done under the supervision of an expert and recognized instructor of *Department of Physiotherapy, JLN Hospital, Ajmer*. The following physiotherapy exercises were carried out**:** Static Quadriceps contraction, half straight leg raising (SLR) in supine position, Full Straight leg raising (SLR) in supine position, Half straight leg raising (SLR) in sitting position**,** Full straight leg raising (SLR) in sitting position and Step ups. After two months the second set of assessment was done.

Assessment Methods:

We registered the patients and gave them international pain scales in the form of questionnaire (VAS, OKS and WOMAC) to complete as pre intervention assessment. All questionnaires were translated to Hindi language for patient's convenience. After two months patients were analyzed on the basis of these same international pain scales (for measuring the pain, disability, and quality of life) as post intervention assessment which includes:-

1. The Visual Analogue Scale (VAS), operationally a VAS is usually a horizontal line, 100 mm in length, anchored by word descriptors at each end. The patient marks on the line the point

that they feel represents the perception of their current state[10, 11].

2. Oxford Knee Score (OKS), The OKS consists of twelve questions covering function and pain associated with the knee. Each question having five options carrying 0-5 scoring. Range of score carrying 0-60, 0 denotes a healthy knee without any pain and 60 denotes the worsening pain[12.]

3.Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) ,The Western Ontario and McMaster Universities Arthritis Index (WOMAC) is a widely used, proprietary set of standardized questionnaires used by health professionals to evaluate the condition of patients with osteoarthritis of the knee and hip. There are three parameters of pain, stiffness and physical functions of the joint in the WOMAC[13]. These parameters carrying a questionnaire format of objective questions, total scoring 0-96 (0 for the healthy knee without pain and 96 denotes the worsening condition).

Result: After acupressure and physiotherapy sessions of two months there was a large and statistically significant ($p<0.05$) drop in the VAS and WOMAC pain scores, and very significant ($p<0.01$) drop in OKS scores for both treated groups (Table 1, 2 and 3).

There were no significant differences between the two groups at intergroup comparison although the reduction in symptoms of osteoarthritis knee occurred in both groups.

The results of our study demonstrate that true traditional Chinese acupressure and physiotherapy are safe and effective for reducing pain and improving physical function in patients with symptomatic knee osteoarthritis who have moderate or greater pain despite background therapy with analgesic or anti-inflammatory therapy. We interpret that no superiority of acupressure compared with physiotherapy in improvements in symptoms of osteoarthritis knee.

Results of our study correlates with Hochberg MC[14] study results which showed that acupressure may have an important role in adjunctive therapy as part of multidisciplinary integrative approach to treating symptoms related to knee osteoarthritis. We have demonstrated that patients with knee osteoarthritis can achieve a short term reduction in VAS, OKS and WOMAC pain scores when treated with acupressure and physiotherapy.

Table 1: VAS score in Acupressure and Physiotherapy

S. No.	Group	No. of cases	Mean±S.D.		t	p value
			Before	After		
1	Acupressure	30	5.88±0.75	5.27±0.74	2.64	<0.05 (S)
2	Physiotheraphy	30	5.83±0.78	5.27±0.74	2.60	<0.05 (S)

(S-Significant)

Table 2: OKS in Acupressure and Physiotherapy

S. No.	Group	No. of cases	Mean±S.D.		t	p value
			Before	After		
1	Acupressure	30	37.97±1.61	34.30±1.51	3.57	<0.01 (VS)
2	Physiotheraphy	30	37.33±1.95	34.40±1.57	3.12	<0.01 (VS)

(VS-Very Significant)

Table 3: WOMAC index in Acupressure and Physiotherapy

S. No.	Group	No. of cases	Mean±S.D.		t	p value
			Before	After		
1	Acupressure	30	50.83±2.95	44.03±2.47	2.09	<0.05 (S)
2	Physiotheraphy	30	51.10±2.50	44.17±2.41	2.71	<0.05 (S)

(S-Significant)

Discussion: In 1999, clinical researchers reported that inserting acupuncture needles into specific body points triggers the production of endorphins[15]. In another study, higher levels of endorphins were found in cerebrospinal fluid after patients underwent acupuncture[16]. Studies of acupressure and massage therapy have shown that

both of these techniques can stimulate endorphin secretion. Endorphins are defined as hormone-like substances that are produced in the brain and function as the body's natural painkillers.

The Physiological basis of decrease in pain is gate control theory. Gate control theory suggests that the spinal cord contains a neurological "gate" that either blocks pain signals or allows them to continue on to the brain. Unlike an actual gate, which opens and closes to allow things to pass through, the "gate" in the spinal cord operates by differentiating between the types of fibres carrying pain signals. Pain signals travelling via small nerve fibres are allowed to pass through, while signals sent by large nerve fibres are blocked. The activation of large types of nerve fibres can modify or block the sensation of pain. Treatment such as massage and acupressure can change a pain message due to some of these differences in nerve fibres and activation of large fibres.

In our study the improvement seen immediately following intervention could reflect the natural history of the disease. Symptoms associated with chronic conditions such as knee osteoarthritis typically fluctuate over time with patients often seeking medical care or enrolling in research when the symptoms are at their worst.

Conclusion: Participants in our study showed statistically significant improvement in both self reported pain and physical function, as well as performance measures of physical function after two months of acupressure and physiotherapy as compared with their baseline.

The present study supports that acupressure and physiotherapy are effective and adjunctive therapy with medication to relieve the symptoms of knee osteoarthritis. In present study we cannot demonstrate any superiority in between acupressure and physiotherapy. As the advancement in the acupressure (For example acupuncture and electro acupuncture) further studies are required to establish the comparative effectiveness of acupressure and physiotherapy.

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References:

1. Moseley JB, O'Malley K, Petersen NJ, et al. A controlled trial of arthroscopic surgery for osteoarthritis of the knee. N Engl J Med. 2002; 347 (2) : 81-88.

2. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V, et al.. "Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010". Lancet, December 2012; 380 (9859): 2163–96.

3. Chopra A, Patil J, Bilampelly V, Relwane J, Tandle HS. Prevalence of rheumatic disease in rural population in Western India: A WHO-ILAR-COPCORD study. J Assoc Physicians India 2001; 49: 240-46.

4. Mahajan A, Jasrotia DS, Manhas AS, Jamwal SS. Prevalence of major rheumatic disorders in Jammu. JK Science 2003; 5 : 63-66.

5. Griffin MR, Piper JM, Daugherty JR, Snowden M, Ray WA. Nonsteroidal anti-inflammatory drug use and increased risk for peptic ulcer disease in elderly persons. Ann Intern Med 1991; 114 (4):257-63.

6. Acupressure.com, The official website of acupressure by Michael Reed Gach, Ph.D.

7. Berman BM, Lao L, Langenberg P, Efficacy of traditional Chinese acupuncture in the treatment of symptomatic knee osteoarthritis: a pilot

study. Osteoarthritis cartilage.1995; 3: 139-42.

8. Fransen M, Crosbie J, Edmonds J. Physical therapy is effective for patients with Osteoarthritis of the knee: a randomized controlled trial. J Rheumatol 2001; 28: 156–64.

9. Slemenda C, Brandt KD, Heilman DK, Mazzuca S, Braunstein EM, Katz BP, Wolinsky FD. Quadriceps weakness and osteoarthritis of the knee. Ann Intern Med. 1997; 127:97–104.

10. Huskisson EC. Measurement of pain. Lancet 1974; 2 (7889):1127-31.

11. Huskisson EC. Visual analogue scales. In: Melzack R, eds. Pain measurement and assessment. New York: Raven Press, 1983:33–7.

12. Dawson J, Hitzpatric R, Murry D, Carr A. Questionnaire on the perception of patients about total knee replacement. J bone joint surg. 1998; 80-B: 63-9.

13. Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to ant rheumatic drug therapy in patients with osteoarthritis of the hip or knee. J Rheumatol 1988; 15: 1833–40.

14. Hochberg MC. Multidisciplinary integrative approach to treating knee pain in patients with osteoarthritis. Ann Intern Med. 2003; 139:781-3.

15. Napadow V, Ahn A, Longhurst J, Lao L, Stener-Victorin E, Harris R, Langevin HM (September 2008). "The status and future of acupuncture clinical research". Journal of alternative and complementary medicine 14 (7): 861–9.

16. Clement-Jones V, McLoughlin L, Tomlin S, Besser G, Rees L, Wen H (1980). "Increased beta-endorphin but not met-enkephalin levels in human cerebrospinal fluid after acupuncture for recurrent pain". Lancet 2 (8201): 946–9.

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