

Effect of Yoga practices on clinical profile of Osteoarthritis Knee: A randomized control trail

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Abstract:

Osteoarthritis of the knee is a major clinical problem. This is usually associated with modern stress full sedentary lifestyle, ill food habits and overweigh. Even with use of all possible pharmaceutical intervention the complete remedy is not possible. A growing body of evidence supports that yoga helps in attaining physical and mental health via down regulation of the hypothalamic–pituitary–adrenal axis and sympathetic nervous system . Yoga therapy involves asana which not only strengthen quadriceps muscles but also relieves stress. Present study\evaluate the functional outcome of Yoga along with traditional treatment over conventional treatment in osteoarthritis patients.

Material and Method: This study was conducted on osteoarthritis patients attending Orthopedic outdoor, KGMU, Lucknow. Thirty patients with bilateral osteoarthritis knee after satisfying our inclusion and exclusion criteria were equally randomized in two groups. Group A was given Yoga with conventional clinical treatment including physiotherapy and group B was given conventional treatment including physiotherapy only. Clinical outcomes were assessed in terms of WOMAC (Western Ontario and McMaster Universities) score before and after giving the treatment at interval of 3 months.

Result: Significant differences were observed within two groups. Evaluation by WOMAC had shown that Severity of pain was 3.267 times lower ($p=0.001$), stiffness functions was 3.198 times lower ($p=0.001$) after giving treatment with Yoga for 3 months as compared to the conventional group.

Conclusion: Yoga therapy involves asana which not only strengthen quadriceps muscles but also relieves stress. It is a good complimentary therapy and could be more beneficial than other therapy.

Key words: Osteoarthritis knee, Yoga, WOMAC score

Introduction

Osteoarthritis (OA) is most common form of arthritis, clinically characterized by pain, inflammation and joint dysfunctions. The etiology of OA is not very clear. Multiple factors including biomechanical, genetic, and environmental stress have been

elucidated to contribute to this disorder. The number of people with OA is increasing because of increase in life expectancy and old age population in society. Number of patients suffering from this disability are expected to be get doubled by the year 2020

^{1,2} Osteoarthritis (OA) is one of the commonest joint disease in India with prevalence of 22% to 39% .^{3,4} Osteoarthritis is a major toll to our modern society & there is an unmet need for an effective management of this ailment. Various treatment options are available ranging from conservative to surgical. Every treatment has its own limitations, none is gold standard. Current medical treatment have limitations in efficacy and associated with significant toxicity on prolong use. In conservative management of OA a variety of therapeutic options are available but none is comprehensive. The need for safer treatment of OA has led to research into many alternatives and complementary therapies.⁵ Yoga has received a good deal of attention in both clinical and basic research during last year's.

Yoga involves both physical and mental disciplines. Yoga helps in attaining physical and mental health via down regulation of the hypothalamic–pituitary–adrenal (HPA) axis and sympathetic nervous system (SNS). Physically it involves stretching and strengthening of various muscles in body to hold and balance through the various scientific postures called asana. It also improves circulation to joints through deep breathing. Yoga is associated with increase endurance of muscles and bone density. It is a cost effective drugless, complementary therapy. Many diseases have been treated throughout the world and more research is being explored. The purpose of this study is to evaluate the functional outcome of Yoga along with physiotherapy over conventional treatment in osteoarthritis patients.

Material and Method

Patients with OA knees attending the outdoor department of Orthopedics KGMU, UP Lucknow were enrolled in the study. We followed ACR Guidelines for diagnosis of osteoarthritis. The inclusion criteria were persistent pain for three months prior to recruitment those fully ambulant, literate and

willing to participate in the study. Those with secondary osteoarthritis due to rheumatoid arthritis, gout, septic arthritis, tuberculosis, tumor, trauma or hemophilia were excluded. The study was approved by the institutional review board and ethical committee. Signed informed consent was obtained from all the participants. The present study was carried out as a pilot study on 30 patients randomized into two groups, 15 in interventional (yoga) group and 15 in control group. The yoga group received yogic asana for 45 minutes (We selected asana in standing, sitting and supine position that would relax and strengthen the knee joint) with traditional treatment in form of wax bath and medication therapy. Control group received medication therapy, physiotherapy and wax bath. The age of patients ranged from 34 to 78 years. There were 18 females and 12 males. The patients were followed up for 3 months

Yogic Intervention

Patients who met our inclusion criteria were randomized into two groups A & B In Group -A, all patients were given 45 min of integrated yoga therapy practice along with conventional clinical treatment and group B patients were given only conventional treatment. The integrated yoga therapy practice included sukshma vyayamas sakti vikasaka (loosening and strengthening practices), Pranayama yoga asana and relaxation techniques. Traditional treatment in form of strengthening exercise Quadriceps drill, hot fomentation and paraffin wax bath to knee were given to both group. Tab- Paracetamol, orally in divided doses were given in both groups for initial ten days of treatment. Clinical outcomes were assessed in terms of WOMAC (Western Ontario and McMaster Universities) score before and after giving the treatment at interval of 3 months.

Statistical tools employed

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values

were represented in Number (%) and Mean±SD. Wilcoxon signed rank test was used to evaluate the within group change.

Result:

There were two groups: Group A was interventional group with 15 subjects and Group B Conventional group with 15 subjects with mean age who completed the study being 53.47±9.98 and 53.73±12.76 respectively. Maximum numbers of subjects in both the groups were housewives. There was only 1 subject who was a teacher. Only 4 (26.7%) subjects in Group I and 3 (20%) in Group II had BMI within normal range. A total of 8 (53.3%) subjects in Group I and 9 (60%) in Group II had BMI in overweight category while 3 (20%)

subjects in each group had BMI in obese category [Table 1] After intervention, range of movement in Group I was found to be significantly higher in Group I as compared to Group II. Values for VAS, WOMAC P, WOMAC S, WOMAC Ph, WOMAC S, WOMAC E and WOMAC in Group I were found to be significantly lower in Group I as compared to Group II (p≤0.05). There was significant improvement in all scores in both the groups [Table 1]. Comparing the percentage improvement in both groups [Table 2], it was noted that there was significant improvement on pain, stiffness function in the interventional group as compared to the conventional group at all intervals.

Table 1: Demographic & Anthropometric Characteristics of patients in two groups

Characteristic	Group I (n=15)	Group II (n=15)	Significance of difference
Mean Age±SD (Range) in years	53.47±9.98 (40-70)	53.73±12.76 (35-78)	p=0.951
Occupation			
Business	0 (0.0%)	4 (26.7%)	p=0.185
Housewife	10 (66.7%)	6 (40.0%)	
Professor	1 (6.7%)	0 (0.0%)	
Retired	2 (13.3%)	2 (13.3%)	
Service	2 (13.3%)	3 (20.0%)	
Sedentary activity	11 (73.3%)	7 (46.7%)	p=0.136
BMI (kg/m ²)			
18.0-25.0	4 (26.7%)	3 (20.0%)	p=0.904
25.0-29.9	8 (53.3%)	9 (60.0%)	
≥30	3 (20.0%)	3 (20.0%)	

Table 2: Clinical parameters in Group I

SN	Parameter	Before Intervention		After Intervention		Significance of change (Wilcoxon signed rank test)	
		Mean	SD	Mean	SD	“z”	“p”
1	WOMAC Pain	10.53	3.66	3.73	1.67	3.421	0.001
2	WOMAC Stiffness	3.67	2.16	0.53	0.92	3.198	0.001

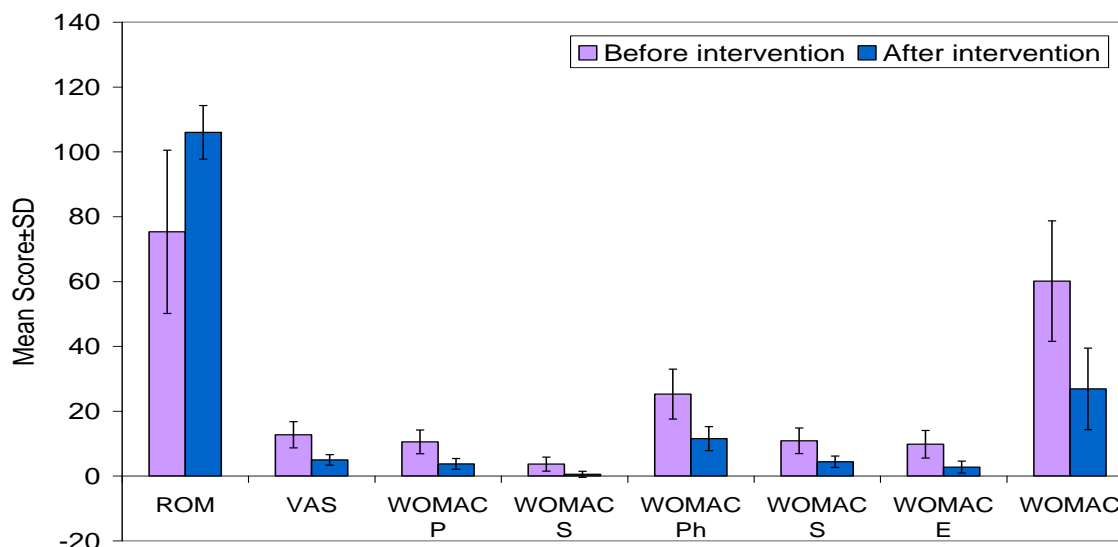


Table 3: Comparison of change in clinical parameters in Group II

SN	Parameter	Before Intervention		After Intervention		Significance of change (Wilcoxon signed rank test)	
		Mean	SD	Mean	SD	“z”	“p”
3.	WOMAC Pain	7.80	3.38	6.60	2.80	3.035	0.002
4.	WOMAC Stiffness	2.87	1.88	2.73	1.22	0.439	0.660

Discussion:

In this study, a sequence of body postures was used specifically as an add-on intervention to existing therapeutic management of primary Osteoarthritis of knee. The results of this study indicates that 90 days course of yoga can be beneficial in reducing pain and stiffness in symptomatic knee OA patients. The intervention was safe; with no injuries experienced by participants. In this study we included five set of asana and pranayam practices which work on clinical parameters of OA knee. Kolasinski *et al.*⁶ used a specific sequence of asana based on the teachings of Iyengar for eight weeks. They measured only the pain and physical functions by WOMAC with a significant reduction ($P=0.04$) in pain by 46.7 We also found in our pilot study on yoga for OA knees similar results and

obtained the significant reduction ($P=0.01$) in pain and stiffness. Ranjita *et al.*,⁷ used a set of integrated yoga therapy program in a non-residential camp set up for one week without any physiotherapy intervention, showed a 40% reduction in resting pain after yoga. but In our study, we added yoga with standard treatment which showed a reduction in resting pain scores by 71.8% after 90 days. Haslock *et al.*⁸ showed the beneficial effects of specific integrated yoga practices in patients with rheumatoid arthritis who had secondary OA in several joints. They observed better increase in hand grip strength (63%, left, 66% right) in yoga group than non yoga controls (8% left and 5% right) indicating reduced stiffness. Our study showed a reduction in early morning stiffness scores ($P=0.01$) after 90 days. None of the other yoga studies have noted

morning stiffness as an outcome variable. Similar effects of pain reduction have been observed by Garfinkel et al.⁹ in a RCT on yoga for carpal tunnel syndrome, wherein the mean NRS scores for pain decreased bAU8 significantly ($p = 0.02$) from 5.0 to 2.9mm. Tekur et al.¹⁰ studied the efficacy of IAYT in patients with chronic low back pain which included several cases of spondylosis of the spine and documented 48.8 % reduction in NRS scores in the yoga group within 1 week of A residential program without offering any physiotherapy intervention. Garfinkel et al.¹¹ looked at the effect of Iyengar yoga in OA hands. Pre-post difference in mean scores of “pain during activity” in their study was similar (4.29) to the current study (3.56 at the second week and 6.19 at 3 months). However, they did not observe a significant difference between groups in tenderness, swelling, or hand functions, whereas these variables were significantly better in yoga than controls in the current study. The study by Kolasinski et al.¹² on Iyengar yoga for OA knees did not show any improvement in the walking time whereas the current study observed significant reduction in walking

time by 27% after 15 days and 53% after 90 days of IAYT. Fisher et al.²⁹ measured the effects of a quantitative progressive exercise muscle rehabilitation program that was added to a physical therapy program and observed significant decreases in walking time and pain experienced during activities.

Conclusion:

Yoga therapy involves different body postures which not only strengthen body muscles but also relieves emotional stress. Yoga is an additional, well compliant, cost effective therapy for osteoarthritis knee, associated with better clinical, functional, it improves quality of life in patients with OA knee.

Competing interest

Authors have declared that no competing interests exist

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REFERENCES

1. Badley EM. Population projections and the effect on rheumatology. *Ann Rheum Dis* 1991;50:3–6.
2. EldersMJ. The increasing impact of arthritis on public health. *J Rheumatol* 2000; 27(Suppl.) 60:6–8
3. Chopra A, Patil J, Bilampelly V. The Bhigwan (India) COPCORD:Methodology and first information report, *APLAR. J Rheumatol* 1997;1:145-54.
4. Mahajan A, Jasrotia DS, Manhas AS, Jamwal SS. Prevalenceof major rheumatic disorders in Jammu. *JK Science* 2003; 5:63-66.
5. Luskin FM, Newell KA, Griffith M. A review of mind/body therapies in the treatment of musculoskeletal disorders withimplications for the elderly. *Altern Ther Health Med* 2000;6: 46–56.
6. Haslock I, Monro R, Nagarathna R. Measuring the effect of yoga in rheumatoid arthritis. *Br J Rheumatol.* 1994; 33:788.
7. Kolasinski SL, Garfinkel M, Tsai AG. Iyengar Yoga for treating symptoms of osteoarthritis of the knees: A pilot study. *J Altern Complement Med.* 2005;11:689–93. [PubMed]

8. Ranjitha R, Nagarathna R. Effect of yoga on pain , mobility, gait and balance in patients with osteoarthritis of the knee. Bangalore: Dissertation submitted to Swami Vivekananda Yoga Anusandhana Samastana (SVYASA); 2006.
9. Garfinkel MS, Singhal A, Katz WA. Yoga-based intervention for carpal tunnel syndrome: A randomized trial. *JAMA*1998; 280:1601–1603.
10. Tekur P, Singhpow C, Nagarathna R. Effect of short term intensive yoga program on pain, functional disability, and spinal flexibility in chronic low back pain: A randomized control study. *J Altern Complement Med* 2008;14:637–644
11. Garfinkel MS, Schumacher R, Husain A. Evaluation of a yoga based regimen for treatment of osteoarthritis of the hands. *J Rheumatol* 1994; 21:2341–2343.
12. Kolasinski SL, Garfinkel M, Tsai AG. Iyengar yoga for treating symptoms of osteoarthritis of the knees: A pilot study. *J Altern Complement Med* 2005;11:689–693.