LUPINE PUBLISHERS

Orthopedics and Sports Medicine: Open Access Journal

DOI: 10.32474/OSMOAJ.2019.03.000161

ISSN: 2638-6003

Case Report

Effect of Intensive Integrative Therapies on Pain, Disability and Quality of Life in Patients with Osteoarthritis Knees: A Comparative Observational Study

Monika Gautam[1]*, Apar Saoji[1], Harish Babu[1] and Vaidya Rohit Mehta[2]

[1]*S-vyasa university, Jigani, India*

[2]*Kayakalp, Himachal Pradesh, India*

***Corresponding author:** Dr. Monika Gautam, BNYS, MD Scholar, S-vyasa university, Jigani, Bangalore, India

Received: December 12, 2019 **Published:** December 18, 2019

Abstract

Objective: To assess the differential effect of intensive yoga, yoga and naturopathy and yoga and Ayurveda management for Osteoarthritis of knees Design: Pre-post comparative study

Participants: Ninty-five individual prediagnosed with knee osteoarthritis according to ACR guidelines aged between 30-75 years were randomized into three groups, i.e., Yoga (n= 36), yoga and Naturopathy (n=30), Yoga and Ayurveda (n=29). All three group received their respective intervention for 1 week at arogyadhama, prashanti kutiram, S-VYASA.

Outcome measures: The primary outcome variables were visual analog scale (VAS) for pain on activity, Western Ontario and McMaster Universities Secondary Osteoarthritis index (WOMAC) and secondary outcome variables were anthropometric measurements and 6 min walk test were measured on day 1 and day 7.

Results: There was significant reduction in VAS scale on activity in yoga group ($p < 0.001$), whereas in Ayurveda group showed significant improvement in stiffness ($p < 0.001$), and significant reduction in weight and pain on rest ($p < 0.001$) was in naturopathy group after 7 days of intervention.

Conclusion: IAYT practices combined with other therapies had better effect than alone IAYT. There were significant changes seen within groups.

Keywords: Knee Osteoarthritis; Integrative Approach of Yoga Therapy (IAYT); VAS; WOMAC; Ayurveda; Naturopathy

Introduction

Movement is a medicine for creating change in a person's physical, emotional, and mental states. Disease is the destroyer of health wealth and mind. Lack of movement of knees leads to the later. The most common of lack of movement is Osteoarthritis (OA) OA knee mainly occurs in elders and middle age people and is more common among women and overweight subjects. The symptoms include pain, stiffness and decreased range of motion (ROM), which result in limited activity and reduced quality of life. The prevalence increases with age, and by the age of 65, approximately 80 percent of the US population is affected. It is the second most common rheumatological problem and most frequent joint disease with prevalence of 22% to 39% in India OA is a heterogenous disease, involving complex and interacting mechanical, biological, biochemical, molecular and enzymatic feedback loops with cartilage degeneration as the common, final event [1] despite this degeneration, OA is an active process and a network of mechanisms reacting to stress or injury on the joint. All joint features are affected in OA [2]. Structural changes include cartilage fibrillation, degeneration of articular cartilage, thickening of subchondral bone, osteophyte formation, synovial inflammation, degeneration of ligaments and meniscus, hypertrophy of joint capsule, cellular and molecular changes in nerves, as well as changes to periarticular muscle, bursa, fat pads [3]. The loss of cartilage and modifications to bone and synovial membrane contribute to an unfavorable biomechanical environment which increases stress on the joint and furthers the progression of cartilage degradation [4]. Non-steroidal anti-inflammatory drugs (NSAIDs), including cyclo-oxygenase II inhibitors and non-opioids analgesics such as acetaminophen have

been the most popular method of managing pain in musculoskeletal tissues. Tradational System of medicine like Ayurveda, Naturopathy and Yoga also specify the symptoms and mode of treatment. So a observational study was planned to understand the effect of this traditional system of medicine.

Aim of the Study

a. To study the differential effect of three Indian systems of medicine on the outcome of OA knee management

Objective of the Study

a. To assess the differential effect of intensive yoga, yoga and naturopathy and yoga and Ayurveda management for Osteoarthritis of knees on pain and stiffness.

b. To assess the differential effect of intensive yoga, yoga and naturopathy and yoga and Ayurveda management for Osteoarthritis of knees on physical functions.

To assess the differential effect of intensive yoga, yoga and naturopathy and yoga and Ayurveda management for Osteoarthritis of knees on anthropometric measurements.

Material and Methods

Source of data

A total of 95 participants aged 30-75 years, were registered from Arogyadhama, a home-based health centre, S- VYASA, bangalore.

Sample size

The sample size was calculated with G-power software by fixing the alpha at 0.05 powered at 0.8 and an effect size of 0.71 based on the mean and SD of an earlier study.

Inclusion criteria

The inclusion criteria were patients clinically/radiologically diagnosed with mild to moderate OA knees according to American college of rheumatology (ACR) guidelines and with associated co-morbidities were included in the study.

Exclusion criteria

Patients with severe OA knees, rheumatoid arthritis, autoimmune diseases, malignancies, knee surgery or knee-arthroscopy and knee pain caused due to congenital dysplasia were excluded.

Ethical consideration

The study was approved by the Institutional Ethics Committee of S-VYASA University (approval letter no: RES/IEC-SVYASA/107/2017 dated 23rd October 2017). Signed informed consent was obtained from all the participants included in this study.

Design

Participants were randomly divided into three groups, i.e., Yoga alone, Yoga and Naturopathy, Yoga and Ayurveda group. All three groups underwent intervention of Integrative approach of yoga therapy (IAYT) and respective therapies for 6 days and assessments and treatment plans for participants were discussed with in-charge doctor and therapists. All groups continued their medication as per prescription.

Grouping and posology

Three groups pre-post comparative study.

Group A: Table 1 Standalone Yoga group

Table 1: Time table.

Time	Schedule
5:30 AM	Om meditation
6:00 AM	Yogasana Practice
7:00 AM	Breakfast
8:00 AM	Maitrimilan
9:00 AM	Parameters & Counselling
10:00 AM	Pranayama
11:00 AM	Yogasana Practice
12:00 PM	Lecture
1:00 PM	Lunch
2:00 PM	Rest
3:00 PM	Cyclic Meditation
4:00 PM	Yogasana Practice
5:00 PM	Malt & Tuning to Nature
6:00 PM	Bhajana
6:30 PM	Trataka, Mind Sound Resonance Technique (MSRT)
7:30 PM	Dinner
8:15 PM	Happy Assembly
10:00 PM	Bedtime

Group B: Table 2 Integrative Yoga and Ayurveda group

Table 2: Time table.

Time	Schedule
5:30 AM	Om meditation
6:00 AM	Yogasana Practice
7:00 AM	Breakfast
8:00 AM	Maitrimilan
9:00 AM	Parameters & Counselling
10:00 AM	Ayurveda treatment
11:00 AM	Yogasana practice
12:00 PM	Lecture
1:00 PM	Pranayama
2:00 PM	Rest
3:00 PM	Cyclic Meditation
4:00 PM	Yogasana Practice
5:00 PM	Malt & Tuning to Nature
6:00 PM	Bhajana
6:30 PM	Trataka, Mind Sound Resonance Technique (MSRT)
7:30 PM	Dinner
8:15 PM	Happy Assembly
10:00 PM	BedTime

Group C: Table 3 Integrative Yoga and Naturopathy group

Table 3: Time table.

Time	Schedule
5:30 AM	Om meditation
6:00 AM	Yogasana Practice
7:00 AM	Breakfast
8:00 AM	Maitrimilan
9:00 AM	Parameters & Counselling
10:00 AM	Naturopathy treatment
11:00 AM	Lunch
12:00 PM	Lecture
1:00 PM	Pranayama
2:00 PM	Rest
3:00 PM	Cyclic Meditation
4:00 PM	Yogasana Practice
5:00 PM	Malt & Tuning to Nature
6:00 PM	Bhajana
6:30 PM	Trataka, Mind Sound Resonance Technique (MSRT)
7:30 PM	Dinner
8:15 PM	Happy Assembly
10:00 PM	Bed Time

Assessment criteria

Primary outcome variables

a) Visual analog scale for pain on activity

b) WOMAC Indian version

c) 6 min walking distance test - The subjects were asked to walk on a flat surface for 6 minutes and the distance covered was expressed in meters.

Anthropometric measurements

a) Height: It was measured with stadiometer in centimeters (cm), and later converted into meters.

b) Weight: Weight was measured using research grade electronic weighing scale.

c) BMI: By using formula, weight in kg/ height in meter2, calculated the body mass

index of every individual.

Observations

Table 4

Table 4: Observations.

	Ayurveda	Naturopathy	Yoga	Total
Sample size	**n=29**	**n=30**	**n=36**	**N=95**
Age	61.79±8.85	61.47±7.99	61±7.62	61.39±8.05
Male/Female	20-Sep	22-Aug	Mar-33	20/75
Height (cm)	155.48±8.96	160.5±10.6	155±2.83	156±1.41
Weight (kg)	73.24±12.03	76.90±14.99	71.23±11.63	60.65±11.81

Results

Recapitulation

In the current study, variables were taken at baseline and following one week of intensive yoga, yoga and Ayurveda and yoga and naturopathy therapies. The primary outcome variable was pain pain assessed through Visual Analogue Scale (VAS) while resting, walking on plane surface, climbing stairs up and down as well as WOAMC scores. The secondary assessments included anthropometric measurements; and 6 min walking distance. We also recorded the vital parameters such as systolic and diastolic blood pressure, pulse rate and respiratory rates at baseline and at the end of one-week intervention for all three groups.

Yoga and ayurveda group

Within group comparison revealed that as compared to the baseline following variables showed significant improvement in weight, body mass index, 6-min walk test, WOMAC global score, WOMAC-pain, stiffness and physical functioning, visual analog score on rest, walking, climbing up and down. The values of within group comparison through paired sample t test are mentioned in Table 4.

Yoga and naturopathy group

Table 5: With-in group comparison changes in yoga and ayurveda group.

Variables		t	df	Sig. (2-tailed)
Pair 1	WT-PRE - WT-POST	5.143	28	***.000
Pair 2	BMI-PRE - BMI-POST	4.898	28	***.000
Pair 3	SYS-PRE - SYS-POST	1.011	28	0.32
Pair 4	DIA-PRE - DIA-POST	1.914	28	0.066
Pair 5	PR-PRE - PR-POST	-1.02	28	0.317
Pair 6	RR-PRE - RR-POST	1.1	28	0.281
Pair 7	6-PRE - 6-POST	-5.259	28	***.000

Pair 8	WGS-PRE - WGS-POST	4.992	28	***.000
Pair 9	PAIN-PRE - PAIN-POST	5.809	28	***.000
Pair 10	STF-PRE - STF-POST	3.36	28	**.002
Pair 11	PF-PRE - PF-POST	4.243	28	***.000
Pair 12	VAS-PRE - VAS-POST	2.806	28	**.009
Pair 13	VAS-WK-Pre - VAS-WK-Post	4.105	28	***.000
Pair 14	VAS-UP-Pre - VAS-UP-Post	5.359	28	***.000
Pair 15	VAS-DOW - VAS-DW	4.914	28	***.000

Within group comparison revealed that as compared to the baseline following variables showed significant improvement in weight, body mass index, systolic blood pressure, respiratory rate 6-min walk test, WOMAC global score, WOMAC- pain, stiffness and physical functioning, visual analog scale on rest, walking and climbing up and down. The values of within group comparison through paired sample t test are given in Table 5.

Yoga group

Within group comparison revealed that as compared to the baseline following variables showed significant changes in weight, Diastolic blood pressure, Pulse rate, 6 MIN walking distance, WOMAC global scores, WOMAC-pain, stiffness and physical functioning, visual analog score on rest, walking and climbing up and down. The values of within-group comparisons through the paired samples t-test are mentioned in Table 6.

Table 6: Within group changes in yoga and naturopathy group.

Variables		t	df	Sig. (2-tailed)
Pair 1	WT-PRE - WT-POST	8.21	29	***.000
Pair 2	BMI-PRE - BMI-POST	8.137	29	***.000
Pair 3	SYS-PRE - SYS-POST	3.313	29	**.002
Pair 4	DIA-PRE - DIA-POST	1.058	29	0.299
Pair 5	PR-PRE - PR-POST	1.705	29	0.099
Pair 6	RR-PRE - RR-POST	2.269	29	*.031
Pair 7	6-PRE - 6-POST	-3.844	29	***.001
Pair 8	WGS-PRE - WGS-POST	4.987	29	***.000
Pair 9	PAIN-PRE - PAIN-POST	4.469	29	***.000
Pair 10	STF-PRE - STF-POST	3.223	29	**.003
Pair 11	PF-PRE - PF-POST	4.695	29	***.000
Pair 12	VAS-PRE - VAS-POST	4.038	29	***.000
Pair 13	VAS-WK - VAS-WK	4.793	29	***.000
Pair 14	VAS-UP - VAS-UP	6.185	29	***.000
Pair 15	VAS-DOW - VAS-DW	5.396	29	***.000

Table 7: Within group changes in yoga group.

		t	df	Sig. (2-tailed)
Pair 1	WT-PRE - WT-POST	3.44	35	**.002
Pair 2	BMI-PRE - BMI-POST	-0.402	35	0.69
Pair 3	SYS-PRE - SYS-POST	1.659	35	0.106
Pair 4	DIA-PRE - DIA-POST	2.556	35	*.015
Pair 5	PR-PRE - PR-POST	2.181	35	*.036
Pair 6	RR-PRE - RR-POST	0.44	35	0.663
Pair 7	6-PRE - 6-POST	-2.47	35	*.019
Pair 8	WGS-PRE - WGS-POST	3.86	35	***.000
Pair 9	PAIN-PRE - PAIN-POST	3.812	35	***.001
Pair 10	STF-PRE - STF-POST	3.416	35	**.002
Pair 11	PF-PRE - PF-POST	3.497	35	***.001
Pair 12	VAS-PRE - VAS-POST	4.12	35	***.000
Pair 13	VAS-WK - VAS-WK	5.718	35	***.000

Pair 14	VAS-UP - VAS-UP	8.63	35	***.000
Pair 15	VAS-DOW - VAS-DW	7.657	35	***.000

Abbreviations

WT: Weight, DBP: Diastolic Blood Pressure, PR: Pulse Rate, WGS: WOMAC Global Score, STF: Stiffness, PF: Physical Functioning, VAS: Visual Analog Scale, WK: Walking, DW: Down, BMI: Body Mass Index, SBP: Systolic Blood Pressure, RR: Respiratory Rate, WOMAC

Table 8 presents the changes in all three groups at baseline and at the end of one week. None of the variables between groups were found significant both at baseline and following the one-week intervention duration.

Table 8: Results of the study.

Variable	Ayurveda (n=29)			Naturopathy (n=30)			Yoga (n=36)		
	Pre	Post	% Change	Pre	Post	% Change	Pre	Post	% Change
Weight in Kg	73.24±12.03	72.01±11.56***	1.68	76.90±14.99	74.99±14.45***	2.48	71.23±11.63	70.05±11.13**	1.65
BMI	30.36±4.49	29.89±4.31***	1.54	31.19±4.81	30.48±4.85***	2.28	28.36±4.55	28.55±4.92	-0.67
SBP in mmHg	128.21±12.52	124.83±16.46	2.63	133.80±15.81	128.07±14.18**	4.28	127.78±14.60	123.56±13.90	3.3
DBP in mmHg	79.45±9.41	75.93±7.83	4.43	79.87±9.71	78.13±7.96	2.17	78.11±9.22	73.67±8.38*	5.68
PR in bpm	75.90±8.20	77.66±8.02	-2.32	79.13±10.04	76.10±7.13	3.83	76.47±6.88	73.50±6.10*	3.88
RR in cpm	17.55±3.11	16.83±3.22	4.1	19.23±3.36	17.77±2.61*	7.59	18.06±2.96	17.81±3.43	1.38
WGS	55.93±19.70	44.72±16.81***	20.04	57.13±20.83	43.87±19.46***	23.21	55.00±18.32	44.94±21.09***	18.29
WOMAC-Pain Subscale	7.55±3.57	5.59±3.23***	25.96	8.43±3.74	6.23±3.31***	26.09	8.03±3.53	6.08±4.19***	24.28
WOMAC-stiffness	3.21±2.09	2.34±1.58**	27.1	3.63±2.29	2.80±1.77**	22.86	3.28±1.58	2.44±1.71**	25.61
WOMAC-PF	45.17±15.36	36.79±13.54***	18.55	44.43±15.38	34.80±15.68***	21.67	43.69±14.45	36.53±16.44***	16.39
VAS-rest	2.79±2.55	1.72±1.96**	38.35	3.43±2.74	2.40±2.27***	30.02	3.19±3.04	1.91±2.18***	40.12
VAS-Walk	5.36±2.50	4.17±2.44***	22.2	5.80±2.51	4.33±2.72***	25.34	5.86±2.78	4.06±2.46***	30.72
VAS-up	7.33±1.66	5.97±1.97***	18.55	7.23±2.24	5.70±2.36***	21.16	7.25±2.18	4.86±2.38***	32.96
VAS-down	6.81±2.58	5.38±2.53***	20.99	7.27±2.49	5.47±2.80***	24.75	7.00±2.40	4.86±2.32***	30.57
6-min walk distance(m)	209.25±54.9	238.05±51.3***	13.76	211.5±83.7	241.65±67.5***	14.25	239.4±71.1	253.8±64.8*	6.01

BMI: body mass index, SBP: systolic blood pressure, DBP: diastolic blood pressure, PR: pulse rate, RR: Respiratory rate, WGS: WOMAC global score, WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index, PF: Physical function, VAS: visual analog scale.

Outcome Measures

All participants were assessed for primary and secondary outcomes twice, at baseline (day 1) and end of study period, day 7.

Primary outcomes

i. Visual Analog Scale (VAS): The visual analogue scale is a psychometric response scale which was used to assess pain on climbing stairs (20 staircases), climbing down from stairs (20 staircases) as well as following 6 min walking on flat surface. It was be used as an instrument to measure subjective quantification of pain. When responding to a VAS item, respondents was be asked to specify their level of pain by indicating a position along a continuous line between two endpoints.

ii. WOMAC: The WOMAC has been extensively evaluated in populations suffering from osteoarthritis (N Bellamy, Buchanan, Goldsmith, Campbell, & Stitt, 1988). The Indian version of WOMAC was used to assess the disability and quality of life [5]. Western Ontario and McMaster Universities Secondary Osteoarthritis index (WOMAC) is widely used in the evaluation of Hip and Knee Osteoarthritis. It is a self-administered questionnaire consisting of 24 items divided into 3 subscales assess the three dimensions of pain, disability and joint stiffness in knee and hip osteoarthritis [6].

Secondary outcome measures: Anthropometric Measurements

i. Height: Was measured in Centimeters (cm)
ii. Weight
iii. BMI: 6- min walk test
iii. BMI
iv. 6-min walk test

Discussion

Modus operandi of yoga and naturopathy therapy

Possible mechanism of improvement in yoga and naturopathy group is detoxification treatment, diet restriction and physical activity which help them more in reducing pain and improve the physical functioning. Yoga and naturopathy integrated therapies

are found to reduce inflammatory markers in patients with chronic inflammatory disorders [7]. This could be the mechanism of action for improvement in the outcomes of OA knees through Yoga and Naturopathy.

Modus operandi of ayurveda therapy

The possible mechanism of action behind reduction of all the symptoms is due to medicated oil application frequently but the long-term effects of such applications need to be studied Ayurveda and Naturopathy therapies was planned by respective doctors.

Conclusion

Although statistically insignificant, the current study revealed that integration of naturopathy to yoga therapy was effective in reducing weight, and pain, whereas integrating Ayurveda to yoga therapy could lead to better reduction in stiffness in patients with OA knees. Such non-significant trends could be tested using larger sample size with prolonged intervention period in future studies.

Strength of The Study

The strengths of the study are:

a) This multidisciplinary study encompasses the fields of yogic science, Ayurveda and Naturopathy.

b) No earlier study has reported integration of yoga with Ayurveda and naturopathy for OA knees.

c) Because the duration of intervention was short, acceptability and adherence to therapy was good

d) As integration were delivered through a standard protocol, it could be reproduced in the exact way for all cases.

References

1. Martel Pelletier J, Pelletier JP (2010) Is osteoarthritis a disease involving only cartilage or other articular tissues? Eklem Hastaliklari ve Cerrahisi 21(1): 2-14.
2. Umlauf D, Frank S, Pap T, Bertrand J (2010) Cartilage biology, pathology, and repair. Cellular and Molecular Life Sciences 67(24): 4197-4211.
3. Goldring SR, Goldring MB (2006) Clinical aspects, pathology and pathophysiology of osteoarthritis. Journal of Musculoskeletal & Neuronal 122 Interactions 6(4): 376-378.
4. Heijink A, Gomoll AH, Madry H, Drobnič M, Filardo G, et al. (2012) Biomechanical considerations in the pathogenesis of osteoarthritis of the knee. Knee Surgery Sports Traumatology Arthroscopy 20(3): 423-435.
5. Das SK, Mishra K, Ramakrishnan S, Srivastava R, Agarwal GG, et al. (2002) A randomized controlled trial to evaluate the slow acting symptom modifying effects of a regimen containing colchicine in a subset of patients with osteoarthritis of the knee. Osteoarthritis and Cartilage 10(4): 247-252.
6. Baron G, Tubach F, Ravaud P, Logeart I, Dougados M (2007) Validation of a short form of the Western Ontario and McMaster Universities Osteoarthritis Index function subscale in hip and knee osteoarthritis. Arthritis & Rheumatism 57(4): 633-638.
7. Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW (1988) Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. The Journal of Rheumatology 15(12): 1833-1840.

DOI: 10.32474/OSMOAJ.2019.03.000161