AYU

Clinical Research

Clinical evaluation of selected *Yogic* procedures in individuals with low back pain

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Abstract

The present study has been conducted to evaluate selected *yogic* procedures on individuals with low back pain. The understanding of back pain as one of the commonest clinical presentations during clinical practice made the path to the present study. It has also been calculated that more than three-quarters of the world's population experience back pain at some time in their lives. Twelve patients were selected and randomly divided into two groups, viz., group A *yogic* group and group B control group. Advice for life style and diet was given for all the patients. The effect of the therapy was assessed subjectively and objectively. Particular scores drawn for *yogic* group and control group were individually analyzed before and after treatment and the values were compared using standard statistical protocols. *Yogic* intervention revealed 79% relief in both subjective and objective parameters (i.e., 7 out of 14 parameters showed statistically highly significant $P < 0.01$ results, while 4 showed significant results $P < 0.05$). Comparative effect of *yogic* group and control group showed 79% relief in both subjective and objective parameters. (i.e., total 6 out of 14 parameters showed statistically highly significant ($P < 0.01$) results, while 5 showed significant results ($P < 0.05$).

Key words: *Asana*, low back pain, *pranayama, yoga.*

Introduction

History of practicing of *yoga* goes since time immemorial. Ancient sages had practiced *yoga* for the purpose of self-realization. They have realized the necessity of steady posture for a steady mind which is essential for spiritual uplift. The impossibility to disregard the greater benefits gained by the *yoga* practice for preserving the health has also been realized.[1]

Among the innumerable *yogasanas*, there are some which work specially on back. These *asanas* help in relaxing the tight muscles, reducing the tension and strengthening them. *Yoga* practices such *asana* and *pranayama* correct the vertebral curvatures, with respective angles and strengthen thoracic and abdominal cavities along with respiratory muscles supporting the maintenance of proper posture.

Aims and objectives

1. To formulate a new feasible therapeutic approach in the management of low back pain using certain *yogic* practices.

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2. To evaluate the efficacy of the above formulated treatment plan in the management of low back pain patients and conduct a comparative study between *yogic* management group and control group.

Materials and Methods

1. Patients attending the OPD of M.P.I.Y.N.E.R. and I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, were selected for this study.
2. Patients were questioned and examined on the basis of proforma and clinical tests such as straight leg raising test, femoral stretch test, etc.[2]

Criteria for selecting patients

Inclusion criteria

1. Patients having back pain for more than 3 weeks were selected, irrespective of their religion, sex, occupation, caste and socioeconomic status.
2. Age limit 30–60 years.

Exclusion criteria

1. Patients suffering from any major concurrent illness which affects one or more systems of the body were excluded, e.g., ischemic heart disease, diabetes mellitus, tuberculosis, bone malignant tumors, etc.

2. Patients having back pain due to non-spinal illnesses were excluded, e.g., Urinary tract infection (UTI), gastrointestinal GI diseases, uterine diseases.
3. Patients having positive neurological signs were excluded.
4. Patients of age below 30 years and above 60 years were excluded.

Plan of the study

Selected patients were randomly categorized into two groups:
Group A patients were treated as per the *yogic* treatment plan and
Group B patients were advised on proper diet and lifestyle.

Management of patients

The *yogic* treatment plan is given in Table 1.

Lifestyle and diet plan[9]

Patients of both the groups were advised to stick to the following lifestyle and diet plan.

1. *Morning*: Wake-up, drinking a glass of lukewarm water
- Attend natural calls.
- Exercises and prayer.
- *Breakfast* - Daliya/pauva/sprouts/upma/oats/fresh fruits.

- Herbal tea/fruit juice/milk/butter milk.

2. *Afternoon - Lunch* - Roti, boiled vegetables, salad with raw vegetables, vegetable curry, small quantity of rice and dhal, fresh fruits, butter milk.
- After lunch, sit in *Vajrasana* for a few minutes.

3. *Evening* - Fruits/fruit juice/mamra/kakhra/milk/herbal tea.

4. *Night - Dinner* - Khichadi/daliya, vegetable soup/mung soup, green leafy vegetables.
- After dinner walking for few minutes.
- Prayer in *Vajrasana.*
- Retire to bed.

Advice to the patients

Following advice was given regarding maintaining the correct posture, while bending, lifting objects, walking, standing, sitting and sleeping.

1. Don't lift by bending over. Instead, bend your hips and knees and then squat to pick up the object. Keep your back straight, and hold the object close to your body.
2. Don't twist your body while lifting.
3. Push, rather than pull, when you must move heavy objects.

Table 1: Group A: *Yogic* treatment plan[3-8]

First week	Min.	Second week	Min.	Third week	Min.
Pranadharana prayer in *Vajrasana*	10	*Pranadharana* prayer in *Vajrasana*	10	*Pranadharana* prayer in *Vajrasana*	10
Sukshma Vyayama		*Sukshma Vyayama*		*Sukshma Vyayama*	
Rotation/stretches	15	Rotation/stretches	15	Rotation/stretches	15
Crocodile exercises 1,2,3	10	Crocodile exercises 1,2,3,4	10	Crocodile exercises 1,2,3,4,5,6	10
*Asana**				*Asana**	
Standing postures		Standing postures		Standing postures	
1. *Tadasana*	02	1. *Tiryak Tadasana*	02	1. *Vrikshasana*	02
		2. *Kati Chakrasana*	02	2. *Kati Chakrasana*	02
Supine postures		Supine postures		Supine postures	
1. *Ardha-halasana* with a bent leg	02	1. *Ardha-halasana* with both legs raising	02	1. *Halasana*	02
2. *Setubandhasana*	02	2. *Setuasana*	02	2. *Setuasana*	02
		3. Pavanamuktasana	02	3. *Pavanamuktasana*	02
Prone postures		Prone postures		Prone postures	
1. *Ardha-śhalabhasana*	02	1. *Ardha-śhalabhasana*	02	1. *Śhalabhasana*	02
2. *Niralambasana*	02	2. *Bhujañgasana*	02	2. *Bhujañgasana*	02
				3. *Sarpasana*	02
Sitting postures		Sitting postures		Sitting postures	
1. *Vakrasana*	02	1. *Vakrasana*	02	1. *Gomukhasana*	02
2. *Śhaśhankasana*	02	2. *Śhaśhankasana*	02	2. Śhaśhankasana	02
				3. *Ardha-matsyendriyasana*	02
Shatkriya		Shatkriya		Shatkriya	
Kapaalabhati	02	*Kapalabhati*	02	*Kapalabhati*	02
Pranayama		Pranayama		Pranayama	
1.*Ujjayi in Vajrasana*	03	1.*Ujjayi in Vajrasana*	03	1.*Ujjayi* in *Vajrasana*	03
2. *Anuloma-Viloma*	03	2. *Anuloma-Viloma*	03	2. *Anuloma-Viloma*	03
Aumkar	05	*Aumkar*	05	*Aumkar*	05
Śhanti mantra	02	*Śhanti* mantra	02	*Śhanti* mantra	02

*After every asana, 2 minutes rest was given to the patients.

4. If you must sit for long periods, take frequent breaks and stretch.
5. Wear flat shoes or shoes with low heels.
6. Exercise regularly. An inactive lifestyle contributes to lower back pain.

Clinical assessment and grade of total effect

The improvement in the patients was assessed mainly on the basis of relief in the cardinal symptoms of the disease. To assess the effect of therapy objectively, all the signs and symptoms were given scoring pattern depending upon their severity as below:

Subjective criteria

The subjective criteria for assessment of pain are as follows.[10]

1. Pain Intensity
   No pain: 0
   Mild pain: 1
   Moderate pain: 2
   Severe pain: 3
   Worst possible pain: 4

2. Sleeping
   Perfect sleep: 0
   Mildly disturbed sleep: 1
   Moderately disturbed sleep: 2
   Highly disturbed sleep: 3
   Totally disturbed sleep: 4

3. Personal care (washing, dressing, etc.)
   No pain; no restrictions: 0
   Mild pain; no restrictions: 1
   Moderate pain; needs to go slowly: 2
   Moderate pain; needs some assistance: 3
   Severe pain; needs 100% assistance: 4

4. Travel (driving, etc.)
   No pain on long trips: 0
   Mild pain on long trips: 1
   Moderate pain on long trips: 2
   Moderate pain on short trips: 3
   Severe pain on short trips: 4

5. Work
   Can do usual work plus unlimited extra work: 0
   Can do usual work; no extra work: 1
   Can do 50% of usual work: 2
   Can do 25% of usual work: 3
   Cannot work: 4

6. Recreation
   Can do all activities: 0
   Can do most activities: 1
   Can do some activities: 2
   Can do a few activities: 3
   Cannot do any activity: 4

7. Frequency of pain
   No pain: 0
   Occasional pain; 25% of the day: 1
   Intermittent pain; 50% of the day: 2
   Frequent pain; 75% of the day: 3
   Constant pain: 4

8. Lifting
   No pain with heavy weight: 0
   Increased pain with heavy weight: 1
   Increased pain with moderate weight: 2
   Increased pain with light weight: 3
   Increased pain with any weight: 4

9. Walking
   No pain till any distance: 0
   Increased pain after 1 mile: 1
   Increased pain after 1/2 mile: 2
   Increased pain after 1/4 mile: 3
   Increased pain with all walking: 4

10. Standing
    No pain after several hours: 0
    Increased pain after several hours: 1
    Increased pain after 1 hour: 2
    Increased pain after 1/2 hour: 3
    Increased pain with any standing: 4

$$\text{To calculate score} = \frac{\text{total score of 10 items}}{40} \times 100\%$$

Objective criteria

The objective criteria for assessment of pain are as follows.[8]

1. Forward flexion: ....cm
2. Left lateral flexion: ....cm
3. Right lateral flexion: ....cm

General Observations

In this study, 12 individuals having low back pain were registered, irrespective of their socioeconomic status, gender, religion, etc. They were randomly divided into two groups. The distribution of patients according to various factors is given in Tables 2–19.

Effects of the treatments

Subjective and objective parameters were used to assess the severity of the disease and its impact on the quality of life of the patients. Subjective parameters were evaluated by using a system of 10 individual scores and their total score, while objective parameters were assessed with a system of three individual scores. These subjective and objective categories were analyzed and compared using statistics. Particular scores drawn for *yogic* management group (Group A) and control group (group B) were individually analyzed before and after treatment and values of both the groups were compared using standard statistical protocols, such as paired and unpaired Student's *t*-test. The following details were drawn based on the results of statistical analysis and comparison.

In *yogic* management group, the following was found as the progress after the treatment [Table 20].

These results indicate the need for an improvement in those insignificant subjective and objective parameters such as sleeping, walking, and right lateral flexion.

In control group, the following was extracted as statistical results [Table 21].

Table 2: Distribution of registered individuals

Category	Group A	Group B	Total
Registered	6	6	12
Completed	6	6	12
Discontinued	—	—	—

Table 3: Age wise distribution

Age (in years)	Group A	Group B	Total
30–39	4	6	10
40–49	2	—	2
50–59	—	—	—

Table 4: Gender wise distribution

Sex	Group A	Group B	Total
Male	1	1	2
Female	5	5	10

Table 5: Marital status wise distribution

Marital status	Group A	Group B	Total
Married	3	1	4
Unmarried	3	5	8

Table 6: Religion wise distribution

Religion	Group A	Group B	Total
Hindu	4	3	7
Jain	1	-	1
Buddhist	-	2	2
Christian	1	1	2

Table 7: Occupation wise distribution

Occupation	Group A	Group B	Total
Student	2	6	8
Farmer	—	—	—
Housewife	2	—	2
Shopkeeper	—	—	—
stocker	—	—	—
Cleaner	1	—	1
Housemaid	1	—	1

Table 8: Education wise distribution

Education	Group A	Group B	Total
Illiterate	—	—	—
Primary	1	—	1
Secondary	3	—	3
Graduate	2	6	8

Table 9: Socioeconomic status wise distribution

Socioeconomic status	Group A	Group B	Total
Poor	2	—	2
Lower middle	1	1	2
Middle		2	2
Rich	3	3	6

Table 10: Diet wise distribution

Diet	Group A	Group B	Total
Vegetarian	4	2	6
Non-vegetarian	2	4	6

Table 11: Addiction wise distribution

Addiction	Group A	Group B	Total
Tobacco	—	—	—
Tea	1	—	1
Coffee	—	—	—
Alcohol	—	—	—
Steroid	—	—	—

Table 12: Deha Prakriti wise distribution

Deha Prakriti	Group A	Group B	Total
Vata–Pitta	4	3	7
Kapha–Pitta	1	3	4
Kapha–Vata	1	-	1

Table 13: Agni wise distribution

Agni	Group A	Group B	Total
Tikshna	1	2	3
Sama	2	1	3
Vishama	—	3	3
Manda	3		3

Table 14: Kostha wise distribution

Kostha	Group A	Group B	Total
Mridu	1	1	2
Sama	2	2	4
Krura	3	3	6

Table 15: Habitat wise distribution

Habitat	Group A	Group B	Total
Urban	6	6	12
Rural	—	—	—

Table 16: Family history wise distribution

Family History	Group A	Group B	Total
Positive	4	4	8
Negative	2	2	4

Table 17: Onset wise distribution

Onset	Group A	Group B	Total
Acute	3	3	6
Insidious	3	3	6

Table 18: Desha wise distribution

Desa	Group A	Group B	Total
Jangala	—	—	—
Sadharana	6	6	12
Anoopa	—	—	—

Table 19: Chronicity wise distribution

Chronicity (in years)	Group A	Group B	Total
<1	2	2	4
1 to 2	—	2	2
2+ to 3	1	1	2
3+ to 4	—	—	—
>4	3	1	4

Table 20: Results of *yogic* treatment group

Result	No. of subjective parameters (out of 11)	No. of sbjective parameters (out of 03)
Highly significant	07	—
Significant	02	02
Insignificant	02	01

Table 21: Results of control group

Result	No. of subjective parameters (out of 11)	No. of objective parameters (out of 03)
Highly significant	—	—
Significant	—	—
Insignificant	11	03

Table 22: Comparison between *yogic* management group and control group

Result	No. of subjective parameters (out of 11)	No. of objective parameters (out of 03)
Highly significant	06	—
Significant	02	03
Insignificant	03	—

A comparison made between the *yogic* management group and the control group yielded the following results [Table 22].

Once again, there is a point of caution here. Among the 11 subjective parameters, 3 are found to be statistically insignificant and they are sleeping, work and walking. It again confirms the previous result by being incapable to produce proper effect for the parameters of sleeping and walking.

Discussion

Disease (low back pain) occurrence was observed maximally at the age of 30–39 years. It may be due to more physical activity during this age and maintaining wrong body postures while working, sitting, standing, or sleeping. Furthermore, there may be fast food (wrong food combination) intake in this busy period of life, and lack of judiciously selected curative exercises can also be considered as causes of this disease. Highest incidence of low back pain was observed among female gender. This may be due to excessive household work, lack of rest and relaxation and also maintaining wrong

body postures, especially while working. Students were mostly affected by this disease. When considering the students, they may be studying for long hours in one position due to extreme competition; moreover, they are not willing to spend time for physical exercises. This sitting position also may be incorrect. One of these facts or all factors together contribute in causing low back pain among students. Majority of patients were found from rich background. Two things can be taken into consideration here. Firstly, sedentary lifestyle and work-related stress of these people and, secondly, the institute being a self-financed one, the treatment was limited to patients who could afford. Obviously due to this reason it has restricted the people of low socioeconomic status, registering in this study.

Effect of the therapy
Overall effects of group A (yogic group)
*Y*ogic treatment provided 79% relief in both subjective and objective parameters [i.e., 7 out of 14 parameters showed statistically highly significant ($P < 0.01$) results, while four showed significant results ($P < 0.05$)].

Comparative effect of group A (yogic group) and group B (control group)
*Y*ogic treatment provided 79% relief in both subjective and objective parameters [i.e., 6 out of 14 parameters showed statistically highly significant ($P < 0.01$) results, while 5 showed significant results ($P < 0.05$)].

Conclusion

At the end of the study, the following points can be concluded on the basis of the observations drawn and the results achieved.
- Low back pain can be prevented in a majority of cases, provided maintaining of correct posture, regular and proper exercises, intake of proper selections of food and preserving proper mental health are all followed.
- Causes of back pain are understood as multifactorial. Highly successful management of multifactorial disease depends on multi-focus treatment approach. Since *yoga* is a holistic method, it is equipped with multi-target approaches. Hence, testified successful results have been obtained.
- Results of this study are encouraging but a trial should be conducted on a large sample in a long duration of time with clinical investigations for a final conclusion.

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हिंदी सारांश

अधः पृष्ठशूल में विशिष्ट योगिक क्रियाओं के प्रभाव का चिकित्सकीय अध्ययन

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प्रस्तुत अध्ययन में अधः पृष्ठशूल के १२ रूग्णों को दो वर्गसमूहों में बाँटा गया । प्रथम वर्गसमूह में विशिष्ट योगिक क्रियाएँ और द्वितीय वर्गसमूह में विशिष्ट आहार एवं जीवनशैली प्रयुक्त की गयी । इन दोनों समूहों में परिणामों का तुलनात्मक अध्ययन करने पर योगिक चिकित्सा द्वारा उत्साहवर्धक लाभ मिला ।