

Yoga can improve migraine and related stress disorders – a study from Meerut, North India



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Abstract

Background

Migraine is a common disabling primary headache disorder mainly affects youth during their most productive age. Despite the need for a perfect treatment of this debilitating condition, the ideal “cure” is yet to be established. Conventional medical therapy is effective but it has different side effects. Alternative medicine researches are still in progress. Integrated therapy of conventional medicine and yoga may prove to be effective against migraine.

Methods

This study included 60 patients, with signs and symptoms of migraine without aura. Patients were divided into two groups, with each group having thirty patients. Group-A (treated with conventional medical therapy alone) and group-B, (treated with conventional medical therapy combined with yoga) for six months. Hospital anxiety and depression scale (HADS), pittsburgh sleep quality index (PSQI), and migraine disability assessment test (MIDAS) questionnaires were used in this study. Students’ t test was performed.

Results

In this study it has been observed that patients in group B showed a marked significant improvement in migraine status ($P < 0.001$), sleep ($P < 0.001$), depression & anxiety ($P < 0.001$).

Conclusion

Integrated medical therapeutic approach with yoga is beneficial in treating migraine and some selective associated mood disorders as compared to conventional medical therapy. However further studies are required.

Key words

Jalaneti, Kapalbhathi, Migraine, Pranayama, yoga



Background

Migraine is a disabling, painful, primary headache disorder which involves a dysfunctional vascular system and associated with stress. It has been mentioned that females have higher prevalence than males in adulthood but lower prevalence before puberty. The average age at onset for boys is 7.2 years and for girls is 10.9 years. Migraine is found very commonly in between the ages of 25-55 years, the most worthwhile and significant period of life. It has been also reported that migraine causes huge monetary loss in a year due to loss of work hours and less productivity [1, 2].

Migraine sufferers not only tolerate extensive pain but also suffer from different psychological mood disorders [3]. It has been observed that stress, anxiety and depression are very commonly associated with migraine patients [4, 5]. Sleep deprivation is also a seen migraine patients, so clinicians recommends them more sleep hours than healthy population [6]. It was suggested by some anecdotal evidence that migraine incident rates are becoming higher in certain places like India [7]. Pathophysiology of migraine is not clearly understood, which may leads the condition from a remitting state to more complex state [8].

Evidence based management of migraine is mostly conventional medical therapy, are effective but having clear side effects [9]. Alternative medicine research is still very less, but may prove efficacy. Yoga already proved effective and popular as a therapeutic intervention in variety of disorders and stress management, but relatively fewer articles are available on yoga in treatment of Migraine. Migraine management already has adopted by contemporary as well as various alternative therapies, but a better approach for affective interventions is still needed [6, 10].

Aim of this study was to find out the efficacy of combined approach of conventional medical therapy and yoga which may prove to be effective against migraine and related mood disorders.

Material and Methods

Study Period

The present study was done in the year 2011 from the month April to September.

Study design and the participants

The present study was done in the Department of Physiology, Subharti Medical College and Hospital, Meerut. 60 patients who had complained of migraine were selected for the study. The age groups of the subjects were between 10 to 55 years, screened by neurologist according to "International headache society" (IHS) criteria for migraine.

Subjects were obtained from OPD of Chhatrapati Sivaji Subharti Hospital, Meerut and adjoining clinics and hospitals in the Meerut city, Uttarpradesh, India.

Detailed medical history of patients were taken and they were divided equally (N=30) and randomly into two groups, group-A (treated with conventional medical therapy alone) and group-B, (treated with conventional medical therapy combined with Yoga).

Group A - Patients were treated with conventional medical therapy according to a physician for six months). For acute attack most commonest drugs used were Sumatriptan, Naratriptan, Zolmitriptan, Almotriptan, Eletriptan, Ergotamine, NSAID'S- Aspirin, Paracetamol, Diclofenac, Naproxen etc. For Prophylaxis Propranolol, Methylsergide, Cyproheptadine, Flunarizine, Clonidine, Tricyclic antidepressants, Pizotifen were used.

Group B - Patients were treated with combined conventional medical therapy with yoga) from the same physician. One of the study investigators is a professional yoga expert, who taught an integrated yogic approach to the subjects. Yoga postures include breathing practices, Pranayama (yoga breathing), relaxation practices and meditation for 5 days a week for 60 minutes. Kriya (cleansing process) was taught once in a week with deep relaxation [6]. For the better knowledge, perception and make them comfortable with the procedure, participants were given printed handouts of techniques to practice at the prodromal stage of migraine. Patients were instructed not to practice during headache, resolution, and postdrome stage.

Patients were instructed to maintain a diary for a period of six months, in which they recorded duration, frequency, pain intensity of migraine for each week. They were informed about triggering factors, types and causes of migraine. Each participant also filled a personal detail form which was based on measurement of frequency and duration of migraine attack. Average record of frequencies and durations of headache of a week before and after treatment phase were collected. All patients were filled standardized questionnaires of hospital anxiety and depression scale (HADS), Pittsburgh sleep quality index (PSQI), migraine disability assessment test (MIDAS) to measure anxiety, depression, sleep and migraine status. Yoga Postures, which was mainly focused on stretching of neck, shoulder, back muscles followed by relaxation, toning, strengthening, and flexibility.

Yogic approaches in this study were Kriya - Jananeti (nasal water cleansing) followed by Kapalbhati (forced exhalations) goes further in stimulating the nerves, glands, and organs of the entire nasal and cranial area including the eyes, sinuses,



ears, and cranium. Patients were guided to practice breathing techniques, relaxation postures, and deep relaxation techniques in the prodromal stage [6].

Jalaneti – performed two times in the morning, once in a week.

Patients were instructed to fill the neti Pot with warm salt mixed water, and then place the nose cone of the neti pot into the right nostril, which seals it to the nostril (by slight pressure). Then opening mouth and gently breathe through the mouth. Now they were instructed to bend slowly in forward direction and keeping the nose cone fully sealed into the right nostril such a way that water doesn't come out. They continued mouth breathing while the water flows. After a few seconds water ran out through the left nostril [11, 12].

Kapalbhati – performed in the morning with duration of 10–15 minutes, according to the comfortability. Patients were instructed to sit straight and crossed legs. Then take in a deep breath and exhale quickly and suddenly, which arouse a puffing sound. They were asked to focus on exhaling forcefully and not on the inhalation. They were also told to draw the abdominal muscles inward during exhalation, simultaneously. Abdomen was also noticed for rising during inhalation and fold during exhalation. They continued for 10 breaths and then took a break [13, 14].

HADS was used in this study is a self-assessment instrument of 14 items intended to evaluate anxiety and depression in physically ill populations. Each item has 4 possible answers, scored from 0 to 3. The score of clinical significant for the 2 subscales is 10 and over [6].

MIDAS was used to find out the consequences of illness on the ability to work and function. MIDAS is a seven-item questionnaire that assesses severity of migraine status [15].

PSQI – This is an effective instrument used to measure the quality and patterns of sleep in the older adult. It differentiates “poor” from “good” sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of medication, and daytime dysfunction over the last month. The patient self-rated each of the seven areas of sleep. Scoring of answers are based on a 0 to 3 scale, a global sum of “5” or greater indicates a “poor” sleeper [16, 17].

Data collection

Investigators distributed all different type of questionnaires amongst the patients and they were instructed to fill it correctly and after understanding it properly. Blood pressure, pulse rate, frequency and duration of migraine

attack were also measured before and after intervention from each patient of both groups.

Inclusion criteria

Patient's diagnosed migraine without aura was considered for this study. All religions patients included with an age group between 10 to 55 years. Subjects were agreed comply with the protocol and to give consent for participating in the study.

Exclusion criteria

Patients receiving other therapy, (Ayurveda, Reiki, Homeopathy and yoga etc.) for last one month, pregnant women, patients, suffering from significant disease, psychiatric problems, major physical impairment which, in the opinion of the therapist, may either put the subject at risk, or may influence the results, or the subjects' ability to participate in the study. Subject's history of alcohol or drug abuse was not considered. Patient's age below 10 years and above 55 years was not taken in this study.

Sample size calculation

From a pilot study it is estimated that for 95% confidence interval and, significance level $\alpha = 1\%$, $P = 70\%$, $Q = 30\%$, allowable error = 15%, required sample size was 30.

Ethical committee approval

All subjects were explained about the procedures to be undertaken and written informed consent was obtained. Ethical clearance was received for this proposed research from the ethical committee of Subharti Medical College. Sixty screened and voluntarily interested patients were selected. Consent was taken from their parents who were below 18 years.

Data management and statistical analysis

SPSS 17 was used in this study and paired 't' tests were performed to compare and analyze the data between pre and post treatment subgroup of same group, and unpaired' tests were performed in between different post treatment group. Confidence level-95% used in this study.

Results

The prevalence of migraine was found to be higher in the age group 21 to 31(71%) and lowest in the age group 10 to 20 (7%). Youths are mostly vulnerable in this context. 47 (78%) patients were totally dependent on allopathic medicine; 13 (22%) patients had tried both allopathic and alternative medicine. 42 (70%) patients were female.



It was observed that after paired “t” test in-between Group-A pre and post treatment group, diastolic blood pressure, sleep quality index were not significant in post treatment group ($P>0.001$), where systolic blood pressure Mean \pm SD became higher than pre treatment group (pre treatment-122.7 \pm 9.40, post treatment-126.2 \pm 4.8). MIDAS, Duration and frequency of migraine status were extremely significant ($P<0.001$), HADS Anxiety status was also found significant in post treatment group ($P<0.01$).

Lastly both post treatment groups of A and B were analyzed by using unpaired “t” test. All the outcome parameters were seen extremely significant in post treatment group of group-B ($P<0.001$), except SBP and DBP But improvement was seen in SBP and DBP (mean \pm SD in post treatment group of group-B). Pulse rate was also significant in group B ($P<0.05$).

Table – 1 Physiological Parameters before and after experiment

Parameter	Group A		P value	Group B		P value
	Treatment Option: conventional drugs only			Treatment option conventional drugs & Yoga		
	Pre	Post		Pre	Post	
Pulse rate	80.8 \pm 5.7	80.2 \pm 5.8	0.199 ^x	80.9 \pm 7.1	76.0 \pm 4.05	0.001 [†]
SBP	122.7 \pm 9.4	126.2 \pm 4.8	0.087 ^x	128 \pm 5.01	123.7 \pm 8.6	0.023 [*]
DBP	78.5 \pm 4.9	78.5 \pm 5.03	0.999 ^x	77 \pm 4.2	76.4 \pm 4.4	0.002 [†]
PSQ	13.5 \pm 3.2	13.2 \pm 3.17	0.103 ^x	11.7 \pm 1.5	7.9 \pm 1.4	0.000 [†]
HADS (Depression)	11.2 \pm 2.5	10.7 \pm 2.76	0.074 ^x	11.7 \pm 2.7	8.3 \pm 1.1	0.000 [†]
HADS (Anxiety)	11.3 \pm 1.8	10.9 \pm 1.7	0.013 [†]	14.3 \pm 3.3	8.8 \pm 1.3	0.000 [†]
MIDAS	15.5 \pm 1.9	8.5 \pm 1.1	0.000 [†]	19.4 \pm 1.3	5.5 \pm 1.5	0.000 [†]
Frequency	7.4 \pm 1.13	5.63 \pm 0.66	0.000 [†]	10.18 \pm 2.14	4.46 \pm 0.50	0.000 [†]
Duration	10.6 \pm 2.7	5.46 \pm 0.57	0.000 [†]	6.42 \pm 1.27	4.36 \pm 0.49	0.000 [†]

[†] P<0.01, statistically significant
^{*} P<0.05, statistically significant
^x P>0.05, statistically not significant

Group-B has been revealed that sleep quality index, HADS anxiety and depression scale, MIDAS frequency and duration of migraine status were extremely significant. ($P<0.001$), other outcome parameters pulse rate, SBP, DBP were also found to be Significant ($P<0.05$).

Table – 2 Comparison between Mean \pm S.D of post treatment part of both groups

Parameter	Group –A Post treatment	Group-B Post treatment	P value
Pulse rate	80.2 \pm 5.84	76.0 \pm 4.05	0.002 [†]
SBP	126.2 \pm 4.8	123.7 \pm 8.6	0.179 ^x
DBP	78.5 \pm 5.03	76 \pm 4.44	0.097 ^x
PSQI	13.2 \pm 3.17	7.9 \pm 1.4	0.001 [†]
HADS (Depression)	10.9 \pm 1.8	8.3 \pm 1.17	0.001 [†]
HADS (Anxiety)	10.7 \pm 2.7	8.86 \pm 1.38	0.001 [†]
MIDAS	8.53 \pm 1.10	5.5 \pm 1.5	0.001 [†]
Frequency	5.63 \pm 0.66	4.46 \pm 0.50	0.001 [†]
Duration	5.46 \pm 0.57	4.36 \pm 0.49	0.001 [†]

[†] P<0.01, statistically significant
^{*} P<0.05, statistically significant

Discussion

In the present study, we observed that apart from the conventional medicine, yoga can give comparatively more beneficial effect on various migraine parameters.

Changes in BP and pulse rate after yogic practice

A number of earlier research works for the treatment of migraine pain using yoga and a number of asanas for shoulder, back and neck, pranayamas showed beneficial effects. The main mechanism contributing in the yogic treatment of migraine is a state of calm alertness, which includes increased parasympathetic activity, calming of stress response systems and involvement of neuroendocrine system by releasing of hormones, also a positive coordination with thalamic generators [6, 18].

Drugs used to treat migraine have been associated with numerous undesirable side effects. Considering the yogic exercise and meditation, moderately intense aerobic exercise is well known to lower blood pressure. A very interesting finding demonstrated in a randomized controlled study showed that even a relatively short period of regular one hour yogic practice can be compared as effective method as medical therapy in controlling blood pressure of hypertensive individuals [19]. These findings support our



study. In the post treatment group (group - B) we got significant reduction in the blood pressure.

Research works done by Selvamurthy et al showed that Yoga significantly decreases heart rate and systolic and diastolic blood pressures [20-22]. Our study outcome also supports it. Relaxation therapy, transcendental meditation along with psychological counseling support, was found to have a convincing antihypertensive and beneficial effect on cardiovascular system [23].

The probable mechanism which reduces blood pressure may be due to autonomic influences, as in essential hypertension Impaired baroreflex sensitivity is considered as one of the major contributing factor, so blood pressure reduction in yoga practice can be explained by its advantageous effects on the autonomic neurological functions [20]. Some researches documented that yogic postures can restore baroreflex sensitivity. Asana that are equivalent to head-up or head-down tilt were the most beneficial in this context. Scientific evidences proved immediate down-regulating effect of yoga on the HPA axis responses to stress.

Changes in anxiety, depression and sleep quality

Stress management by yogic activities is also well established [24]. yoga has an immediate quieting effect on the HPA axis response to stress. Some studies has been hypothesized that specific yoga exercises cause a shift toward parasympathetic nervous system dominance by direct vagal stimulation. Apart from the pathophysiological aspects, yoga has been shown to have immediate psychological effects for decreasing anxiety and an increased emotional feelings and spiritual well-being [25-28].

A questionnaire based study done by Javnbakht et al shows that participation in a two-month yoga class can lead to significant decrease in perceived levels of anxiety among females. From the pre and post results of our study also supporting those outcomes [29]. Sushil et al stated that Kapalbhathi and breath awareness can improve the stress status, our research corroborates these findings [30].

Conclusion

The present study evaluated the effectiveness of integrated therapeutic approach of yoga and conventional medicine on migraine. In summary, this study provides preliminary evidence that integrated yoga (Jalaneti followed by Kapalbhathi) and conventional medical therapy may be used together as an effective treatment mode in migraine and related mood disorders. However further long term studies

are required in more depth to ascertain more beneficial effects.

Limitations & future scope of the study

The main drawback of this study is the sample size, which is less and it is recommended to perform a multicenter study in future, with a larger population. Long term follow up also needed to get more accurate result.

Abbreviations

Hospital anxiety depression scale (HADS), Migraine disability assessment score (MIDAS), Pittsburgh Sleep Quality Index (PSQI), International headache society (HIS)

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

SS and BM distributed the questionnaire, interpreted the data, drafted the manuscript, and revised it. BR conceived of the study with NS, DV, AB, AA and VJ, acquired & interpreted the data and revised the manuscript. SS, RM took part in data analysis, interpreted the data, and revised the manuscript.

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