SCIENTIFIC EVALUATION OF EFFECT OF YOGIC PRACTICES OVER ARDHAVABHEDAKA (MIGRAINE)

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Received on: 05/12/16 Revised on: 26/12/16 Accepted on: 23/01/17

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DOI: 10.7897/2277-4343.08113

ABSTRACT

A lot of ancient literature including Samhitas, texts etc. modern science literature and published material in various journals, magazines has been studied. For this clinical study, randomly total 50 cases of Ardhavabhedaka (Migraine) were selected based on presenting complaints as described in Ayurveda, from Neurology Medicine OPD. These 50 cases were divided in two subgroups; control and intervention consisting 25 cases in each. In control, sub-group no medication was advised but in intervention subgroup, initially light medication of 1st order was given. Yogic practices were done regularly twice a day (twenty minutes in morning and in evening time) for 3 months by the cases of both groups. Evaluation of symptoms and anxiety rating scale was done monthly for three months (three follow-up) in all cases of both groups. Paired and unpaired Friedman’s test, chi² test and Wilcoxon Signed Rank’s Test were applied to assess changes in the quantitative variables from base line to different s.

INTRODUCTION

Headache is such a common complaint and can occur for so many different reasons that its proper evaluation may be difficult. Headaches may be of acute onset and chronic in nature. Chronic headaches are commonly due to migraine, tension, or depression.1 Almost all ancient Acharyas have mentioned about the Shiro-raga of which Shiratshula (headache) as the main symptom. Shiratshula in general is one of the commonest complaints of the people. Exact cause is unknown. Acharya Charaka emphasized the role of Manah Santapa (emotional disturbance) and Rodana (Weeping) is the etio-pathogenesis of headache. In present period it may produce by overload of work related to family, occupation and job. It becomes the result of chronicity of the psychosomatic disorders. Many people are susceptible to headache at the time of emotional disturbance. Headache can be initiated or amplified by various triggers, including glare, bright lights, sounds, or other afferent stimulation; hunger; surplus stress; physical hard work; violent climate or barometric pressure changes; hormonal fluctuations during menses; lack of or excess sleep; and alcohol or other chemical stimulation. Knowledge of a patient's susceptibility to specific triggers can be useful in management strategies involving lifestyle adjustments.3

The term migraine refers to a syndrome of vascular spasm of cranial blood vessels. Symptoms of migraine may include heightened sensitivity to light and sound (sonophotophobia), nausea, auras (loss of vision in one eye or tunnel vision), difficulty of speech and intense pain predominating in one side of head. Where these symptoms have almost similarity with condition Ardhavabhedaka described in classics.4 The word Ardhavabhedaka has two components viz. Artha and Avahdaka. Artha means half side. Thus, literal meaning of Ardhavabhadaka is perforating or bursting out like pain in one half of the head either right or left. Chakrapani, the commentator of Charaka Samhita made it clear by saying Ardhavabhadaka means “Artha Mastaka Vedana (pain in half side of head)”5. It is termed as half headache by the common people and related as migraine in modern sciences. It is a severe interrupted headache, teases once in 3/5/10/15 or 30 days. As the condition one half of the head develops severe tearing and prickling pain, giddiness and piercing pain, suddenly after a fortnight or ten days. This should be diagnosed as Ardhavabhadaka caused by vitiation of all the three Doshas but chief involvement of Doshas are Vata and Kapha.

Nadi Shodhan Pranayama and Dhyana7

The word Nadi means 'energy channel' and Shodhana means 'to cleanse' or 'to purify'. Therefore, Nadi Shodhana is a practice whereby the Pranic channels are purified and regulated. Nadi Shodhana is also a complete practice and the higher stages achieve the aim of Pranayama. Nadi Shodhana is practised by alternating the inhalation and exhalation between the left and right nostrils, thus influencing the Ida and Pingala Nadas and the two part of brain cerebral hemispheres. This leads to control of the oscillations of the body-mind network, bringing balance and harmony throughout the system.

An unbroken flow of knowledge to particular object is Dhyana. The mind tries to think of one object, to hold itself to one
particular spot, as the top of the head, the heart, etc., and if the mind succeeds in receiving the sensations only through that part of the body, and through no other part, that would be Dharana (concentration), and when the mind succeeds in keeping itself in that state for some time it is called Dhyana (meditation).

Aim of study
To assess the effect of Yogic exercise (Nadi Shodhana Pranayama with Dhyana) over Ardhavahbedaka (migraine) with the help of symptoms and anxiety rating scales.

MATERIALS AND METHODS

Ethical clearance- This study was started after the ethical clearance from institutional ethical committee in accordance with ethical standards. EC registration no. is ECR/256/Inst/UP/2014

Study Design
To study the effect of Pranayama especially Nadi Shodhana Pranayama with Dhyana in stress induced migraine, total 50 cases of Ardhavahbedaka (migraine) were registered randomly following diagnostic criteria as described in Ayurveda. Cases were registered from the Neurology Medicine OPD, IMS, BHU. These 50 cases were divided in two subgroups control and intervention, consisting 25 cases in each.

Control- Only Yogic practices were done.

Intervention- Yogic practices of Pranayama (Nadi Shodhana Pranayama) with Dhyana (meditation) for three months with some very light medications of 1st order initially which were withdrawn later (after one month).

Yogic practices were done two times morning and evening for twenty minutes (Nadi Shodhana Pranayama for 10 minutes followed by Dhyana for 10 minutes), regularly for three months. This duration was equal in all age groups. Evaluation of all symptoms and anxiety rating scale was done monthly for three months (three follow-up) in cases of both subgroups. This evaluation was done based on grade of each symptom. Grade of symptoms and anxiety rating scale was noted before and after Yogic practices.

During this study, all the symptoms of Ardhavahbedaka were recorded with their grading. Along this Hamilton’s Anxiety Rating scale (HARS) grading also.

The HARS is one of the first rating scales developed to measure the severity of anxiety symptoms, and is used in both clinical and research settings. The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety).

Scoring
Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity and 25–30 moderate to severe.

Rupa (General symptoms) of Ardhavahbedaka

According to Charaka, the features of Ardhavahbedaka are i.e., severe pain in half side of the head, affecting particularly neck, eye brows temporal region, ear, eye, and forehead. The pain is like cutting by the sharp objects or piercing in nature aggravated by Pragyata (fast and cold wind), sun rays and sound.

Diagnostic criteria of Ardhavahbedaka

- Shirahshula (Headache)
- Bhrama (Vertigo)
- Bhedatoda (Pricking sensation)
- Utklesha (Nausea)
- Chardi (Vomiting)
- Duration of attack
- Frequency of attack

All the above symptoms were graded in increasing order according to severity. (0=absent, 1= mild, 2=moderate and 4=severe).

Diagnostic criteria for migraine

Classical migraine
- Paroxysmal headache
- Nausea or vomiting
- Aura (usually visual)

Common migraine
- Paroxysmal headache (with or without nausea or vomiting)
- No aura

Exclusion criteria
- Patient with co-morbidity affecting mental or physical health
- Patient with extreme age groups >65 years or <15 years
- Abuse of drugs and alcohol
- Patients with terminal illness or advanced state of disease

Inclusion criteria
- Patients & healthy male & female volunteers between age group 15 – 65 years.
- Patients diagnosed with irregular menstrual cycle, chronic pelvic pain and suffering with stress and anxiety.
- Patients of chronic headache with history of stress

Technique of Nadi Shodhana Pranayam

First sit in any comfortable meditation posture, preferably Siddhasana, Siddha Yoni Asana, Padmasana or Sukhasana. Maintain the head and spine straight. Relax the whole body and close the eyes. Practise Yogic breathing for some time. Adopt Nasagra mudra (nose tip position) with the right hand and place the left hand on the knee in chin or Gyan Mudra. Close the right nostril with the thumb. Inhale and exhale through the left nostril 5 times, keeping the respiration rate normal.

After completing 5 breaths release the pressure of the thumb on the right nostril and press the left nostril with the ring finger, blocking the flow of air. Inhale and exhale through the right nostril 5 times, keeping the respiration rate normal. Lower the hand and breathe through both nostrils together 5 times, keeping the respiration rate normal. This is one round. Practise 5 rounds. The breathing should be silent. In this way, they were prescribed with direction that they must do this breathing Nadi Shodhana Pranayam five to ten rounds (10 minutes) per day for three months.

Technique of Dhyana

Patients were advised any comfortable position may be assumed for sitting as Padmasana and Siddhasana and maintaining Chin Mudra or Gyan Mudra. Then to keep the spine erect and the chest lifted it. This slows down the flow of breath regulate the activity of the brain and leads to the cessation of all thoughts. Keep the body alert with sharp awareness. Keep the brain passive, sensitive and silent, like the thin end of leaf, which shakes even in a gentle breeze. Then advised to close the eyes and look within. Shut the ears to outward sounds. Listen to the inner vibration and follow them until they merge in their source. Any lack of awareness in the eyes and ears creates fluctuation in the mind. In the real sense Dhyana is the integration of the body, mind, intelligence, will, conscious, ego and the self. The mind
acts as the subject and the self-object; yet in reality the self is the subject. The end of the meditation is to make the mind submerge in the self so that all seeking and searching to come at an end. They were advised to stay in meditation for if they can, without any discomfort. Then they were advised to lie in Savasanas for 5-10 minutes.

In this way, they were prescribed with direction that they must do this Dhyana for 10 minutes per day for three months.

**Statistical methods**

At the end of three months’ comparison in grade of symptoms was done and observations were analyzed using statistical methods. Paired and unpaired Friedman’s test, chi² test and Wilcoxon Signed Rank’s Test were applied to assess the changes in the quantitative variables from base line to different sequences of follow up. SPSS 16 soft ware was used to analyze the study. P value <0.05 indicates insignificant result and P value <0.001 indicates highly significant result.

**OBSERVATION AND RESULTS**

Chance of incidence of *Ardhavabhedaka* (migraine) is more common in female (66%) than male (34%). In *Sharirika Prakriti* (Physical constitution) *Vata-j-Kapha Prakriti* (60%) is the most affected than others (VP=26% and PK=14%). *Sharahsula* in intervention subgroup was absent in 4.0% cases initially and was absent in 92% after 3rd follow up, statistically highly significant (p<0.001). In control subgroup *Sharahsula* was absent initially in 8.0% while in 80% after *Yogic* practices, statistically highly significant (p<0.001) also. *Bhrama* in intervention subgroup was absent in 20% initially and was absent in 96% after 3rd follow up, statistically highly significant (p<0.001). In control subgroup *Bhrama* was absent initially in 16% while in 92% after *Yogic* practices, statistically highly significant (p<0.001) also. *Bhedatoda* in intervention subgroup was absent in 12% initially and was absent in 84% after 3rd follow up, statistically highly significant (p<0.001). In control subgroup *Bhedatoda* was absent initially in 16% while in 32% after *Yogic* practices, statistically highly significant (p<0.001) also. *Utklesha* in intervention subgroup was absent in 4% initially and was absent in 84% after 3rd follow up, statistically highly significant (p<0.001). In control subgroup *Utklesha* was absent initially in 00% while in 36% after *Yogic* practices, statistically highly significant (p<0.001) also. *Chardi* in intervention subgroup was absent in 24% initially and was absent in 92% after 3rd follow up, statistically highly significant (p<0.001). In control subgroup *Chardi* was absent initially in 12% while in 64% after *Yogic* practices, statistically highly significant (p<0.001) also. Although in both subgroups results were statistically highly significant (p<0.001) but on observation better result were recorded in intervention than control.

**Table 1: Distribution of 50 cases according to grading of Duration of attack**

<table>
<thead>
<tr>
<th>Sub Groups</th>
<th>No. and Percentage of cases</th>
<th>Within the subgroups comparison Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade</td>
<td>BT</td>
</tr>
<tr>
<td>Control (25)</td>
<td>0</td>
<td>0(0%)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>02(08%)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>06(24%)</td>
</tr>
<tr>
<td>Intervention (25)</td>
<td>0</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>00(00%)</td>
</tr>
<tr>
<td>Between the subgroups comparison-Chi Square test</td>
<td>χ²=2.240</td>
<td>p=0.0087</td>
</tr>
</tbody>
</table>

Table shows initially maximum cases were found to maximum grading in relation to duration of attack and after 3rd follow up maximum cases were related to minimum grading in both intervention and control subgroups, showing statistically highly significant (p<0.001) in both subgroups.

**Table 2: Distribution of 50 cases according to grading of Frequency of attack**

<table>
<thead>
<tr>
<th>Sub Groups</th>
<th>Frequency of attack No. and Percentage of cases</th>
<th>Within the subgroups comparison Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade</td>
<td>BT</td>
</tr>
<tr>
<td>Control (25)</td>
<td>0</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00(00%)</td>
</tr>
<tr>
<td>Intervention (25)</td>
<td>0</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00(00%)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>00(00%)</td>
</tr>
<tr>
<td>Between the groups comparison-Chi Square test</td>
<td>χ²=2.060</td>
<td>p=0.356</td>
</tr>
</tbody>
</table>

Table shows that initially maximum cases were found to maximum grading in relation to Frequency of attack and after 3rd follow up maximum cases were related to minimum grading in both intervention and control subgroups, showing statistically highly significant (p<0.001) in both subgroups.
Table 3: Effect in terms of Hamilton Anxiety Rating Scale of 50 cases

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hamilton Anxiety Rating Scale (HRS)</th>
<th>1-17=1 Mild</th>
<th>18-24=2 Mild to Moderate</th>
<th>25-30=3 Moderate to severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT vs. AT</td>
<td>Control (BT)</td>
<td>2</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Control (AT)</td>
<td>10</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>BT vs. AT, Z= 1.503, p&lt;0.208</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intervention(BT)</td>
<td>4</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Intervention(AT)</td>
<td>14</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BT vs. AT, Z= 2.443, p&gt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table shows that initially maximum cases (22) were related to maximum grading of HARS and after 3rd follow up maximum cases were related to mild to moderate grading followed by minimum grading in control and in intervention initially maximum cases (19) were related to maximum grading of HARS and after 3rd follow up maximum cases were related to mild grading. This result also proved the accessory beneficial response of Yogic practices as the supportive tools of treatment.

**Scientific way of Yogic practices to develop control over Ardhamahedaka**

**Yogic practices Nadi Shodhana Paranayama and Dhyana**

1. Slow and deep breath expand lungs capacity via inhibiting stretching receptors
2. After pranayama Meditation perform which is stable the rhythm of breath
3. Max O₂ reaches inside the blood and removal of max CO₂ occurs, stimulates brain centres in hypothalamus
4. All the hypothetical thinking process of manas settles down, stress response subside
5. Cerebrum develop control over limbic system via sub thalamus
6. This control the fluctuation of mind, and it’s become stable
7. Via developing the control over limbic system, it’s balance the physiology of neuro-endocrine system
8. Proper regulation of neuro endocrine system from cerebrum via cerebral-thalamo hypophysial axis occurs

- Relax and tranquil of the fluctuation of mind
- Increase capacity of memory, cognition and paying attention
- Shifting of sympathetic to parasympathetic system and it remains dominant
- Improving the functions of right and left hemi cerebral sphere
- Balancing of Neuro endocrine system via cerebro-limbic-thalamo axis

**DISCUSSION**

Almost all headaches are disposed to make worse by emotional stressors, but the most frequent are vascular headache like migraine and tension headache. Migraine headaches frequently happen on weekends after the stress is greater than usual. Throughout this time, there is a primary constriction of blood vessels in the scalp, followed by more dilatation to carry out blood for transport away lactic acid and other products formed during the high-energy, fight or flight stage i.e. stress. The engorged vessels, in turn, stimulate the nerves in the region of them to liberate chemicals, which bring into being inflamed. The excessively extended vessels throb as the heart pumps, simulating adjoining tissue so that more chemicals are produced, contributing to the pain and nausea. Biochemical researches have made available evidence for confident physiologic characteristics in migraineurs, which have been projected as predisposing factors for Migraine as platelet serotonin (5-HT) metabolism, platelet activation, and augmented sensitivity to nitric oxide (NO) donors, reduced levels of metabolic enzymes, nonstandard opiate receptor purpose, and electro-encephalographic (EEG) abnormalities. In the present study, maximum registered cases belonged to female category which is also described by a lot of researches. In the United States and wide-reaching, women have a superior incidence of chronic pain as compared to men. Women are more possible than men to report periodic pain, pain in manifold areas
of the body, and pain that is crueler. Many chronic pain syndromes are more common in women, including fibromyalgia, migraine headaches, irritable bowel syndrome, temporomandibular disorder, a variety of neuropathic pain, and others. Women have also been reported in experimental studies to be more responsive to quite a lot of different modalities of pain and have an inferior threshold for pain. Smith et al. report that, in women, high oestrogen states were related with an increase in endogenous mu opioid neurotransmission through painful stimuli. In disparity, low oestrogen states were linked with decline in endogenous opioids in numerous areas of the brain and hyperalgesic responses to stimuli. The influence of hormones on pain awareness may be one of the reasons that gender diversity.17

Mechanisms contributing to a condition of peaceful attentiveness consist of amplified parasympathetic constrain, calming of stress comeback systems, neuro-endocrine release of hormones, and thalamic generators.18 An emergent body of proof also supports the certainty that Yoga paybacks considerable and psychosocial wellbeing during the mechanisms of down-regulation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system. As an outcome, Yoga plays a significant role in plummeting sympathetic activity, escalating parasympathetic activity, getting better quality of life, and declining pain levels. As stated, there is evidence of the benefit of Yoga in reducing pain.19 Thus grading of anxiety scale also gets reduced along with decreased frequency of attack and duration of attack.

CONCLUSION

The Yoga Techniques Pranayama and Dhyana directly affect the Agya Chakra. Concentration on the Chakras while performing Yogic practices and stimulates the flow of energy through the Chakras and helps to activate them. This in turn awakens the dormant areas in the brain and the corresponding faculties in the psychic and spiritual bodies, allowing one to experience planes of consciousness which are normally inaccessible. These practices on stimulation of Agya Chakra develop control and regulation over autonomic nervous system via sifting of sympathetic to parasympathetic nervous system and enhance relax mode of body for rest and digest.

REFERENCES


Cite this article as:


Source of support: Nil, Conflict of interest: None Declared