



Research Article

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SCIENTIFIC EVALUATION OF EFFECT OF *YOGIC* PRACTICES OVER *ARDHAVABHEDA* (MIGRAINE)

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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 sequences of follow up. In this study, most of the symptoms of *Ardhavabhedaka* improved in both subgroups significantly (p<0.001) but better results were observed in intervention subgroup. *Yoga* practices (*Nadi Shodhana Pranayama* (NSP), *Dhyana*/meditation) affecting positively to *Agya Chakra* (hypothalamo-cerebral system) improves quality of life in *Ardhavabhedaka* patients by improving symptoms.

Key words: *Ardhavabhedaka*, *Pranayama*, *Dhyana*.

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-roga* of which *Shirahshula* (headache) as the main symptom. *Shirahshula* 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.² 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. *Ardha* and *Avabhedaka*. *Ardha* means half side. Thus, literal meaning of *Ardhavabhedaka* 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 *Ardhavabhedaka* means "*Ardha Mastaka Vedana* (pain in half side of head)"⁵. It is termed as half headache by the common public 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 pricking pain, giddiness and piercing pain, suddenly after a fortnight or ten days. This should be diagnosed as *Ardhavabhedaka* caused by vitiation of all the three *Doshas*⁶ but chief involvement of *Doshas* are *Vata* and *Kapha*.

*Nadi Shodhan Pranayama and Dhayan*⁷

The word *Nadi* means 'energy channel' and *Shodhana* means 'to cleanse' or 'to purify'. Therefore, *Nadi Shodhana* is a practice whereby the *Pranaic* 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 Nadis* 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 *Ardhavabhedaka* (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 *Ardhavabhedaka* (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 practice 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 *Ardhavabhedaka* were recorded with their grading. Along this Hamilton's Anxiety Rating scale (HARS) grading also.

The HARS⁸ 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 *Ardhavabhedaka*⁹

According to *Charaka*, the features of *Ardhavabhedaka* 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 *Pragvata* (fast and cold wind), sun rays and sound.

Diagnostic criteria of *Ardhavabhedaka*¹⁰

- *Shirashula* (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)¹¹.

Diagnostic criteria for migraine¹²

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 >65years or <15years
- 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*^{13,14}

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 *Gyana 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 Sodhana Pranayam* five to ten rounds (10 minutes) per day for three months.

Technique of *Dhyana*¹⁵

Patients were advised any comfortable position may be assumed for sitting as *Padmasana* and *Siddhasana* and maintaining *Chin Mudra* or *Gyana 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, χ^2 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 software was used to analyze the study. P value >0.05 indicates insignificant result and P value <0.05 indicates significant result. 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) *Vataja-Kaphaja Prakriti* (60%) is the most affected than others (*VP*=26% and *PK*=14%). *Shirahsula*

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 *Shirahsula* 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

Sub Groups	No. and Percentage of cases					Within the subgroups comparison Friedman test
	Grade	BT	FU1	FU2	FU3	
Control (25)	0	0(00%)	02(08%)	07(28%)	12(48%)	$\chi^2=70.159$ $p < 0.001$
	1	02(08%)	07(28%)	08(32%)	05(20%)	
	2	10(40%)	06(24%)	04(16%)	04(16%)	
	3	13(52%)	10(40%)	06(24%)	04(16%)	
Intervention (25)	0	0(0%)	02(08%)	08(32%)	19(76%)	$\chi^2=71.170$ $p < 0.001$
	1	03(12%)	11(44%)	09(36%)	04(16)	
	2	10(40%)	05(20%)	03(12%)	01(04%)	
	3	12(48%)	07(28%)	05(20%)	01(04%)	
Between the subgroups comparison- Chi Square test		$\chi^2=0.240$ $p=0.887$	$\chi^2=1.350$ $p=0.510$	$\chi^2=0.348$ $p=0.840$	$\chi^2=5.290$ $p=0.0214$	

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

Sub Groups	Frequency of attack No. and Percentage of cases					Within the subgroups comparison Friedman test
	Grade	BT	FU1	FU2	FU3	
Control (25)	0	0(00%)	04(16%)	06(24%)	13(52%)	$\chi^2=67.344$ $p < 0.001$
	1	04(14%)	08(32%)	10(40%)	06(24%)	
	2	08(32%)	04(16%)	04(16%)	03(12%)	
	3	13(52%)	09(36%)	05(20%)	03(12%)	
Intervention (25)	0	00(0%)	05(20%)	09(36%)	21(84%)	$\chi^2=68.313p$ $p < 0.001$
	1	06(24%)	09(36%)	08(32%)	03(12%)	
	2	11(44%)	07(28%)	06(24%)	01(04%)	
	3	08(32%)	04(16%)	02(08%)	0(0%)	
Between the groups comparison- Chi Square test		$\chi^2=2.060$ $p=0.356$	$\chi^2=2.900$ $p=0.235$	$\chi^2=2.510$ $p=0.474$	$\chi^2=6.450$ $p=0.040$	

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

Groups		Hamilton Anxiety Rating Scale (HRS)		
		1-17=1 Mild	18-24=2 Mild to Moderate	25-30=3 Moderate to severe
BT vs. AT	Control (BT)	2	1	22
	Control (AT)	10	12	3
BT vs. AT, Z= 1.503, p=0.208				
Wilcoxon Signed Rank's Test	Intervention(BT)	4	2	19
	Intervention(AT)	14	10	1
BT vs. AT, Z= 2.443, p<0.001				

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 *Ardhavabhedaka*²⁰⁻²¹

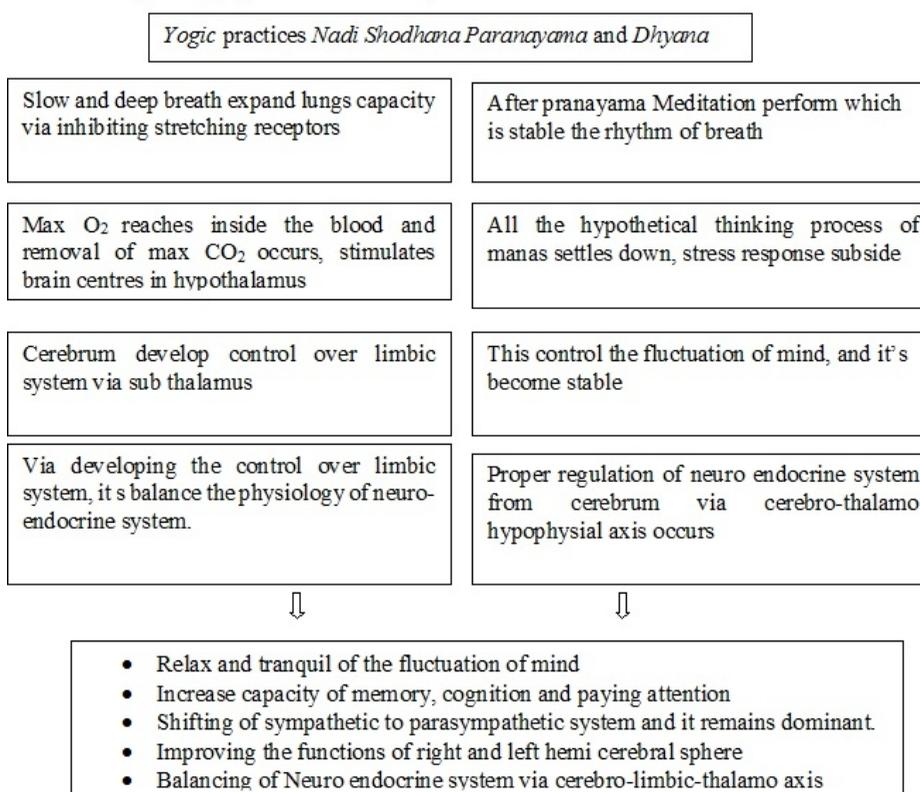


Figure 1: Diagram of the series of events that occur during the autonomic shift present in *Yogic* practices *Nadi Shodhana Pranayama* and *Dhyana*

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 blood 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.¹⁶

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.

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