IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A RANDOMIZED CLINICAL TRIAL ON COMPARATIVE EFFICACY OF *NRIPVALLABHA GHRITA NASYA* AND *JALAUKAVACHARANA* ALONG WITH *PATHYADI GHANA VATI* ORALLY IN THE MANAGEMENT OF *ARDHAVABHEDAKA* W. S. R. TO MIGRAINE

[1]Dr. Mansi, [2]Dr. Shamsa Fiaz

[1]Associate professor, Department of Shalakya Tantra, Murari Lal Rasiwasia Ayurvedic College and Hospital, Charkhi Dadri, India

[2]Professor & HOD, P.G. Department of Shalakya Tantra, National institute of Ayurveda Deemed to be University, Jaipur, India

Abstract

Ardhavabhedaka is one among the 11 types of *Shiro-Roga* described by *Acharya Sushruta*. It can be correlated with migraine in modern science because of the similarities in their key features such as half-sided headache, and paroxysmal nature. Migraine is the second most common primary headache disorder in terms of prevalence but ranks first in term of disability. Because of its increasing prevalence, significant impact on physical, social, and psychological levels, unsatisfactory treatment, drugs side effects, and disease recurrences, the present study was designed to find a better solution through Ayurveda. To evaluate and compare the efficacy of *Nripvallabha Ghrita Nasya* and *Jalaukavacharana* along with *Pathyadi Ghana Vati* in *Ardhavabhedaka* (Migraine). 66 randomly selected patients of *Ardhavabhedaka* were divided into two groups. Group A was treated with *Nripvallabha Ghrita Nasya* and *Pathyadi Ghana Vati* orally and Group B was treated with *Jalaukavacharana* (Leech therapy) along with oral intake of *Pathyadi Ghana Vati*. Results of 60 patients who completed the trial, with 30 patients in each group, showed statistically significant results in the assessment parameters of *Ardhavabhedaka* (Migraine). However, intergroup comparison of the therapies showed statistically not significant results. During the follow-up study, recurrence of headache was observed in some patients, but the frequency, duration, and intensity of the headache were considerably reduced. Hence, *Nripvallabha Ghrita Nasya*, *Jalaukavacharana* and *Pathyadi Ghana Vati* may prove beneficial in the management of *Ardhavabhedaka* or Migraine, if they are used with proper *Pathya-Apathya sevana*.

Keywords: *Ardhavabhedaka*, Migraine, *Jalaukavacharana*, *Nasya*, *Pathyadi Ghana Vati*

I. INTRODUCTION

Shirashoola is a very common symptom that can be found in a variety of diseases described in Ayurveda. It is mentioned not only as a symptom, but also as a separate disease, termed as *Shiro Roga*, with a separate chapter in almost all Ayurveda *Samhitas*. *Ardhavabhedaka* is one of the 11 types of *Shiro-Rogas* mentioned by *Acharya Sushruta*. According to *Acharya Sushruta, Ardhavabhedaka* is a disease in which one half of the head experiences severe tearing, pricking, and piercing pain with giddiness that occurs suddenly, after a

fortnight or ten days due to the vitiated three *Doshas*.[1] *Ardhavabhedaka* is mentioned by *Acharya Vagbhatta* under *Vataja Shiro Roga*, which occurs in one half of the head, recurs every fortnight or month, and subsides on its own. When severely aggravated, it destroys the eyes (vision) and ears (hearing).[2] These features of *Ardhavabhedaka* are analogous to a clinical entity known as Migraine in modern science. Migraine is a primary headache disorder characterized by recurrent attacks of headache lasting 4–72 hours. Typical characteristics of the headache are unilateral location, pulsating quality, moderate or severe intensity, aggravation by routine physical activity and association with nausea and/or photophobia and phonophobia.[3]

Migraine is one of the most common medical complaints. Epidemiological studies have shown that it has a high prevalence as well as significant impact on patient's daily activities, and social or recreational activities. It is the third most common brain disease in the world (behind dental caries and tension-type headache) with an estimated global prevalence of 14.7% (that is around 1 in 7 people).[4] The latest analysis of Global Burden of Diseases (GBD) showed that globally headache disorders were responsible for 46.6 million or 5.4% of total YLDs (Years lived with Disabilities) in 2019. Among this burden of headache disorders, 88.2% is attributable to migraine.[5] Migraine is still undiagnosed and undertreated in at least 50% of patients, and less than half of migraine patients consult a doctor.[6] Migraine costs billions of dollars in treatment and reduced productivity at work. In treatment of migraine, mostly patients require medications during attacks (as abortive therapy) as well as some prophylactic measures (as preventive therapy) to reduce the frequency of the further attacks. All these medications have many draw backs, and their continued use leads to drug dependency, drug withdrawal syndrome, and rebound headache, gastric and hepatic complications. Furthermore, most patients do not respond to pharmacological interventions for migraine headache or are unwilling to take medications.

Considering the aforementioned factors, the present study was designed to find the best possible way to manage this disease through Ayurveda. In Ayurveda, a variety of natural medications and therapies are described to treat different types of *Shirashoola*. *Nasya* is the primary procedure in Ayurveda for balancing the vitiated *Doshas* in *Shiras*, as it is said, "*Nasa hi Shiraso Dwaram*".[7] In the current trial, *Nripvallabha Ghrita* was chosen for *Nasya* because *Ardhavabhedaka* is described in its *Phalashruti* (indications).[8] Moreover, *Ghrita* pacifies *Vata, Pitta,* and *Rakta* and also increases the resistance power against diseases. *Acharya Charaka* has mentioned that the vitiated *Vatadi Doshas* after reaching in head vitiates the *Rakta* to produce *Shiroroga*.[9] *Acharya Sushruta* has mentioned *Raktamokshana* in *Shirorogas* when they are not relieved by any of the measures/treatment described.[10] In addition, Migraine is a neurovascular disease caused by neurogenic inflammation and vasodilatation. Various studies have reported the presence of biologically active substances in the leech saliva having analgesic, and anti-inflammatory properties which are helpful in reducing the pain and inflammation. Therefore, *Jalaukavacharana* (Leech therapy) was selected as an intervention for *Ardhavabhedaka* (Migraine). Along with these, the internal administration of *Pathyadi Ghana Vati* was selected as most of its contents have *Vednasthapana, Raktashodhana, Tridoshahara,* analgesic and anti-inflammatory properties. *Pathyadi Kwatha* is a drug of choice for almost all *Shiroroga* (headaches), [11] but in this study the *Kwatha* (decoction) was converted into *Ghana Vati* (tablet) form to address the issues of palatability, shelf life and dose standardization.

Aim and objectives:

1. To study and establish a conceptual correlation between *Ardhavabhedaka* and Migraine.
2. To evaluate and compare the efficacy of trial drugs and procedures in *Ardhavabhedaka* (Migraine).
3. To study the adverse effect of trial drugs or procedures if any.

II. MATERIAL AND METHODS

This study was approved by the Institutional Ethics Committee vide letter no. IEC/ACA/2018/2/48 dated 12-11-2018 and registered on the Clinical Trial Registry of India (CTRI) portal with registration no. CTRI/2019/07/020001 dated 02/07/2019.

Study Design: The present clinical study is an interventional, open label, randomized, parallel group trial. Computer generated random number table method was used for randomization.

Selection of Patients: The patients presented with the clinical features of *Ardhavabhedaka* (Migraine) were selected randomly irrespective of their gender, occupation, religion etc. The nature of the study was explained to all the patients who were chosen for the research work on the patient information sheet and written informed consent was taken from each patient before starting the trial.

Sample size: A total of 66 patients were registered for the present study but 60 patients completed the trial.

Inclusion Criteria

1. Patients between 16 to 60 years of age from either sex.
2. Patients presenting with symptoms of *Ardhavabhedaka* (Migraine), described as per *Ayurveda* and modern science.

Exclusion Criteria

1. Secondary headaches caused by meningitis, tumors, encephalitis, head and neck trauma, trigeminal neuralgia, cervical spondylitis, refractive errors, sinusitis and other disorders of cranium, neck, eyes, ears, nose, sinuses, teeth etc.
2. Patients with complicated Migraine like status migrainosus, hemiplegic migraine and having any chronic debilitating disease with other neurological pathology.
3. Pregnant and lactating women.
4. Patients suffering from any other major systemic disorders e.g. tuberculosis, cancer, heart disease etc.
5. Patients unfit for *Jalaukavacharna* such as patients with hemorrhagic diseases (e.g. hemophilia), anemia, hypotension, severe allergic diathesis and on anticoagulant treatment.

Grouping of patients and their treatment: In this study, 66 clinically diagnosed *Ardhavabhedaka* (Migraine) patients were randomly divided into two groups, with 32 patients in Group A and 34 patients in Group B, and given the interventions listed in Table no. 1.

Table no. 1 Groups and respective interventions

Group A	Group B
1. ***Nripvallabha ghrita*** Dose - 6 drops per nostril Route of administration - nasal route Duration - *Marsha Nasya* for 7 days with 7 days gap in between two sittings 2. ***Pathyadi Ghana Vati*** Dose - 2 tablets of 500 mg in morning and evening with Luke warm water Route of administration - oral Duration - 30 days	1. ***Jalaukavacharana* (Leech therapy)** Method - Leeches were applied on right or left temporal area just above the eye brows preferably on affected side of head. Duration – once a week for four sittings 2. ***Pathyadi Ghana Vati*** Dose - 2 tablets of 500 mg in morning and evening with Luke warm water Route of administration - oral Duration - 30 days

Follow up: All the patients registered in this study were followed up at regular intervals of 20 days for a period of two months after the completion of clinical trial.

Investigations: Following investigations were carried out to rule out any systemic disease and leech therapy contraindicated diseases- C.B.C, ESR, CT, BT, HIV, HbsAg, FBS, LFT, and RFT. Routine eye checkup including visual acuity, tonometry, refraction and ear, nose, throat, and oral cavity examinations to rule out cause of headache other than migraine.

Assessment Criteria

1. Intensity of headache - The visual analogue scale (VAS) and numeric rating scale (NRS) were used for assessing the intensity of headache.
2. Duration of headache
3. Frequency of headache
4. MIDAS questionnaire - MIDAS (Migraine Disability Assessment Scale) is a clinically validated migraine-associated disability evaluating scale which is used to determine the impact of migraines on a patient's daily life. In this questionnaire, patients are asked about the frequency and duration of their headaches, as well as how frequently these headaches interfered with their ability to participate in activities at work, school, or at home in the last 3 months.[12]
5. The associated symptoms - Nausea and vomiting, *Bhrama*, *Aura*, Photophobia, Phonophobia, Tinnitus, Nasal Discharge, Transient loss/ blurring of vision, Sleep disturbance, and Stiffness of neck were analysed and graded according to the severity.

Statistical Analysis: The results were computed statistically by using SPSS Statistics V21 software. Wilcoxon matched pairs signed ranks test was used for individual group/intragroup comparison and Mann

Whitney test was used for intergroup comparison**.** The results obtained were interpreted as: Not significant (NS) with *P>0.05* and Significant (Sig.) with *P≤0.05*.

III. OBSERVATIONS AND RESULTS

In this study, a total of 66 patients were enrolled, but 6 patients dropped out from the study. Thus, observations of 66 patients and results of 60 patients (with 30 patients in each group) were evaluated. The study revealed that out of 66, the maximum number of patients were in the age group of 16-30 years (54.54%), mostly were females (69.69%), belonged to the middle class (71.21%), and had a vegetarian diet (87.87%). *Vishamashana* (71.21%), *Samashana* (63.63%), and *Adhyashana* (48.48%) were found in the majority of patients as *Aharaja Nidana* while *Vegasandharana* (34.85%) and *Dhupasevana* (25.75%) were found in maximum patients as *Vihraja Nidana*. In *Manasika Nidana, Chinta* was found in maximum (60.60%) patients. In terms of Migraine triggering factors, sunlight/bright light and noise pollution were reported by 68.18%, emotional stress by 60.60%, physical exertion/journey; lack of sleep; fast food/spicy food/chocolates/fermented eatables; and hyperacidity by 46.96%, 36.36%, 33.33%, and 25.75% of patients, respectively. The majority of patients (81.82%) reported sleep as an alleviating factor of pain. The majority of patients had gradual onset of headache (72.72%), headache for 1-3 years (40.91%), headache lasting 7-12 hours/day (50%), 1-2 attacks of the disease per month (46.97%), headache throughout the day (54.54%), unilateral head pain (50%), moderate intensity of pain (56.06%) and had little or no disability as per MIDAS questionnaire (48.48%). Associated complaints in decreasing order of percentage incidence include phonophobia in 89.39%, photophobia in 86.36%, sleep disturbances in 48.48%, nausea and vomiting in 46.97%, *Bhrama* in 45.45%, transient blurring of vision in 25.75%, and stiffness of neck in 18.18% of patients, nasal discharge, and tinnitus in 10.10% and Aura in 7.57% of patients.

The present study showed that the results of both groups were statistically significant (*P<0.05*) in terms of headache intensity, duration, frequency, and MIDAS grading as shown in Table no. 2 and 3. The effect of interventions on associated complaints of *Ardhavabhedaka* (Migraine) as per Table no. 2 and 3 displayed that the complaints of nausea and vomiting, *Bhrama*, photophobia, phonophobia, sleep disturbances, transient loss/blurring of vision and stiffness of neck showed statistically significant (*P<0.05*) results in both groups. In the complaint of nasal discharge, Group A showed statistically significant (*P=0.046*) and Group B showed not statistically significant (*P=0.317*) result. Both groups showed statistically not significant (*P>0.05*) results in aura and tinnitus. Therefore, *Nripavallabha Ghrita Nasya* in Group A, *Jalaukavacharana* **(**Leech Therapy) in Group B and *Pathyadi Ghana Vati* in both groups aided in reducing the chief and associated complaints of *Ardhavabhedaka* (Migraine).

Table no. 2 Effect of therapy on assessment parameters of *Ardhavabhedaka* in Group A

Assessment parameters	Mean		Mean Diff.	% of change	SD	SE	W	p-value	Result
	BT	AT							
Headache intensity	6.37	2.17	4.20	65.97	1.10	0.20	465	0.000	Sig.
Headache duration	2.93	0.97	1.97	67.04	0.67	0.12	465	0.000	Sig.
Headache frequency	2.67	1.17	1.50	56.25	0.94	0.17	351	0.000	Sig.
MIDAS grade	1.87	1.17	0.70	37.50	0.70	0.13	153	0.000	Sig.
Nausea and vomiting	1.07	0.40	0.67	62.50	0.76	0.14	120	0.000	Sig.
Bhrama	0.50	0.13	0.37	73.34	0.49	0.09	66	0.001	Sig.
Aura	0.17	0.03	0.13	80.02	0.43	0.08	6	0.102	NS
Photophobia	1.50	0.43	1.07	71.11	0.58	0.11	351	0.000	Sig.
Phonophobia	1.70	0.43	1.27	74.51	0.58	0.11	406	0.000	Sig.
Tinnitus	0.20	0.07	0.13	66.65	0.43	0.08	6	0.102	NS
Nasal discharge	0.23	0.10	0.13	57.14	0.35	0.06	10	0.046	Sig.
Sleep disturbance	1.07	0.50	0.57	53.13	0.63	0.11	120	0.000	Sig.
Transient loss/ blurring of vision	0.30	0.03	0.27	88.90	0.45	0.08	36	0.005	Sig.
Stiffness of neck	0.17	0.03	0.13	80.02	0.35	0.06	10	0.046	Sig.

Table no. 3 Effect of therapy on assessment parameters of *Ardhavabhedaka* in Group B

Assessment parameters	Mean		Mean Diff.	% of change	SD	SE	W	p-value	Result
	BT	AT							
Headache intensity	6.53	2.10	4.43	67.86	1.25	0.23	465	0.000	Sig.
Headache duration	2.97	0.83	2.13	71.91	0.78	0.14	465	0.000	Sig.
Headache frequency	2.30	0.73	1.57	68.12	0.94	0.17	378	0.000	Sig.
MIDAS grade	1.73	1.10	0.63	36.54	0.81	0.15	91	0.001	Sig.
Nausea and vomiting	0.87	0.23	0.63	73.08	0.81	0.15	105	0.001	Sig.
Bhrama	0.73	0.20	0.53	72.73	0.51	0.09	136	0.000	Sig.
Aura	0.07	0.03	0.03	50.07	0.18	0.03	1.00	0.317	NS
Photophobia	1.60	0.40	1.20	75.00	0.61	0.11	378	0.000	Sig.
Phonophobia	1.67	0.43	1.23	74.00	0.57	0.10	406	0.000	Sig.
Tinnitus	0.07	0.03	0.03	50.07	0.18	0.03	1.00	0.317	NS
Nasal discharge	0.07	0.03	0.03	50.07	0.18	0.03	1.00	0.317	NS
Sleep disturbance	0.83	0.30	0.53	64.00	0.68	0.12	91	0.001	Sig.
Transient loss/ blurring of vision	0.23	0.03	0.20	85.73	0.41	0.07	21	0.014	Sig.
Stiffness of neck	0.27	0.07	0.20	74.99	0.41	0.07	21	0.014	Sig.

However, intergroup comparison of the efficacy of interventions of both groups (Table no. 4) revealed statistically not significant (*P>0.05*) results in all the assessment parameters. This showed that there is no statistical difference in the efficacy of Group A and Group B treatments, indicating acceptance of the null hypothesis.

Table no. 4 Intergroup comparison of effect of therapies on assessment parameters

Assessment parameters	Group	N	Mean Rank	Sum of Ranks	Mean difference	Mann Whitney U	P-value and Result
Headache intensity	Group A	30	30.53	916.00	4.20	449.000	0.988 NS
	Group B	30	30.47	914.00	4.43		
	Total	60					
Headache duration	Group A	30	32.17	965.00	1.97	400.000	0.414 NS
	Group B	30	28.83	865.00	2.13		
	Total	60					
Headache frequency	Group A	30	34.35	1030.50	1.50	334.500	0.063 NS
	Group B	30	26.65	799.50	1.57		
	Total	60					
MIDAS grade	Group A	30	31.05	931.50	0.70	433.500	0.661 NS
	Group B	30	29.95	898.50	0.63		
	Total	60					
Nausea and vomiting	Group A	30	32.53	976.00	0.67	389.000	0.243 NS
	Group B	30	28.47	854.00	0.63		
	Total	60					
Bhrama	Group A	30	29.50	885.00	0.37	420.000	0.492 NS
	Group B	30	31.50	945.00	0.53		
	Total	60					
Aura	Group A	30	30.50	915.00	0.13	450.000	1.000 NS
	Group B	30	30.50	915.00	0.03		
	Total	60					
Photophobia	Group A	30	31.00	930.00	1.07	435.000	0.795 NS
	Group B	30	30.00	900.00	1.20		
	Total	60					
Phonophobia	Group A	30	30.50	915.00	1.27	450.000	1.000 NS
	Group B	30	30.50	915.00	1.23		
	Total	60					

Tinnitus	Group A	30	31.00	930.00	0.13	435.000	0.557 NS
	Group B	30	30.00	900.00	0.03		
	Total	60					
Nasal Discharge	Group A	30	31.50	945.00	0.13	420.000	0.305 NS
	Group B	30	29.50	885.00	0.03		
	Total	60					
Sleep disturbance	Group A	30	33.05	991.50	0.57	373.500	0.176 NS
	Group B	30	27.95	838.50	0.53		
	Total	60					
Transient loss/ Blurring of vision	Group A	30	30.50	915.00	0.27	450.000	1.000 NS
	Group B	30	30.50	915.00	0.20		
	Total	60					
Stiffness of neck	Group A	30	30.00	900.00	0.13	435.000	0.557 NS
	Group B	30	31.00	930.00	0.20		
	Total	60					

IV. DISCUSSION

Almost all *Acharyas* have explained the symptoms of *Ardhavabhedaka* as a half-sided headache with a paroxysmal nature. The various types of pain explained by various *Acharyas* (such as *Toda, Bheda, Sandhibhya eva muchyate, Sirajala Sphurana, Nishkrisyate Akshini Eva Vedana*, and so on) in various places (such as *Sankha, Karna, Akshi, Ghata,* etc.) with the paroxysmal nature indicates *Vata Dosha* dominancy. The description of *Pakshaat, Dashahat, Akasmaat,* and *Swayameva Shamyati* in *Ardhavabhedaka* shows its paroxysmal nature. Most of the *Nidana* described for *Ardhavabhedaka* are mentioned as triggers of migraine in the contemporary science. Either the triggering factors of migraine or the *Nidana* of *Ardhavabhedaka* causes *Vata Prakopa* and *Urdhwagamana* of this *Prakupita Vata* may act as trigger of pain because for pain to occur anywhere, the primary sensory neuron carrying pain sensation has to be activated. In migraine, the trigeminal nerve anteriorly and the upper cervical nerves C2 and C3 posteriorly, carry pain sensations of head, face, and upper neck. Further, this trigeminal nerve also supplies intracranial structures such as meningeal blood vessels and other large blood vessels of the brain, dural sinuses and the dura mater.[13] Consequently, the *Prakupita Vata* may activate the trigeminal vascular system, which is the primary pathway of pain development in migraine. Moreover, all movements, whether at the physical level or cellular level, are functions of the *Vata Dosha*.[14] Therefore, the transmission of pain signals from the trigeminocervical complex to the cerebral cortex in migraine pathophysiology demonstrates *Gati*, which is a crucial feature of *Vata Dosha*. The release of inflammatory mediators and resultant neurogenic inflammation in migraine can be linked to the vitiated *Pitta* and *Kapha Dosha*. According to *Acharya Vagbhatta, Shoola* (pain) cannot occur without *Vata* and *Shotha* (inflammation) cannot occur without *Kapha*.[15] The process of hyperemia and oligemia in case of cortical spreading depression, blood vessel dilatation and related release of chemicals from blood vessels indicates *Rakta Dhatu Dushti* and thus *Pitta Dosha* involvement is obvious. All these factors support the *Tridosha Prakopa* and *Rakta Dhatu Dushti* in *Ardhavabhedaka*, as well as the correlation of Migraine and *Ardhavabhedaka*.

Probable mode of action of interventions in both groups

***Nripvallabha Ghrita Nasya*:** *Acharya Charaka* has stated that *Sneho-Anilam Hanti*, which means that *Sneha* is best in pacifying the *Vata*. *Ghrita* predominates in *Jangama Sneha*, and through its *Sanskaranuvartan* properties, it acquires the properties of the ingredients while retaining its own.[16] In terms of *Doshaghnata*, 19 of the 22 contents of *Nripvallabha Ghrita* have a *Vata-shamaka* effect, 17 have a *Pitta-shamaka* effect, and 11 have a *Kapha-shamaka* effect. *Vata-shamaka* effect may regulate vessels abnormal constriction and dilation. By *Pitta* and *Kapha Shamaka* effect, it may inhibit the release of inflammatory mediators like substance P, neurokinin A, CGRP (calcitonin gene-related peptide) and nitric oxide (NO) etc. described in migraine pathophysiology.[17] The majority of the ingredients in *Nripvallabha Ghrita* have been recognized to have anti-nociceptive, adaptogenic, neuroprotective, anti-inflammatory, anxiolytic, anti-stress, analgesic, and antidepressant properties, which may all help to reduce Migraine symptomatology. *Nasya Karma*, according to *Acharya Charaka*, is the best treatment for *Shiro-Roga* because nose is the nearest available pathway for elimination of *Doshas* from the head. The trigeminal nerve innervates the respiratory and olfactory epithelium of nasal passages, and enters the brain in the pons.[18] As trigeminal nerve is actively

involved in the pain genesis mechanism of Migraine; therefore, *Nasya* with *Nripvallabha Ghrita* may work through this pathway in reducing the pain of migraine.

***Pathyadi Ghana Vati*:** Most of the contents of *Pathyadi Ghana Vati* have a *Tridosha Shamaka* effect, which aids in balancing the *Vata Dosha*, as well as *Pitta* and *Kapha*, and thus alleviating migraine pain. It contains drugs such as *Haridra, Nimba, Guduchi,* which have *Rakta Shodhana* and *Rakta Prasadana* properties that can help to normalize the vitiated *Rakta Dhatu*. *Vednasthapana, Shothahara, Nadi Tantra Balya, Medhya*, and *Rasayana Karma* of the contents, may prove beneficial in breaking the pathogenesis of Migraine. *Vata Anulomaka* property of *Haritaki, Bhibhitaki, Aamalaki* found in *Pathyadi Ghana Vati* normalizes the *Vimarggami Vayu* and helps in reducing the intensity of pain. The contents of *Pathyadi Ghana Vati* have proven anti-inflammatory, antioxidant, anti-stress, analgesic, and anti-nociceptive activities which may help in migraine pain.

***Jalaukavacharana* (Leech therapy):** *Jalaukavacharana* (Leech therapy) comes under *Ashastrakrita* type of *Raktamokshana* (bloodletting) that is suggested for all *Dosha Prakopa* but is especially beneficial for *Rakta* vitiated by *Pitta Dosha*.[19] In *Ardhavabhedaka, Rakta* is the main *Dushya* which is vitiated by all the three *Doshas*. During the trial, it was noticed that leech therapy had a very quick effect on pain. This therapeutic action of leech therapy can be explained by two mechanisms: first, the blood removed by leech sucking mechanism, and second, the contents of leech saliva poured into the host body. The removal of *Ashuddha* or *Dushita Rakta* along with the vitiated *Doshas* results in *Srotoshodhana* that leads to *Anulomana* of obstructed and aggravated *Vata*, and that, might be the cause of significant pain relief. Second, the anesthetic and anti-inflammatory substances in leech saliva, such as antistasin, hirustasin, ghilantens, eglin C, leech-derived tryptase inhibitor, complement C1 inhibitor, guamerin and piguamerin, carboxypeptidase inhibitor, bdellins, and bdellastasin, may contribute to relief in symptoms of migraine (*Ardhavabhedaka*).[20]

After completion of the clinical trial, the follow-up observations revealed that the therapies had a significant effect for about two months, including the trial and the initial follow-up period. But recurrence of pain was later observed in nearly 51.66% of the total 60 patients. Although pain recurred, the frequency, duration, and intensity of the headache were considerably reduced. During the study, no any adverse effects related to the oral intake of *Pathyadi Ghana Vati* and *Nasya* therapy were observed. However, following leech application, three patients developed localized redness and edema at the bite site.

V. CONCLUSION

It can be concluded from the present study that *Nasya therapy*, *Jalaukavacharana*, and the drug *Pathyadi Ghana Vati* were found to be effective in the treatment of *Ardhavabhedaka* (Migraine). MIDAS grading revealed statistically significant results in both groups, indicating that the treatments were effective in reducing migraine-related disability and, as a result, improving quality of life. Because *Jalaukavacharana* showed rapid pain relief, studies comparing it to migraine abortive therapy or large-sample studies on acute pain management with leech therapy can be conducted. Further studies can be carried out to substantiate the efficacy of *Pathyadi Ghana Vati* in comparison to its *Kwatha* formulation.

REFERENCES

[1] Sushruta Samhita, Uttaratantra, *Shirorogavigyaniyaadhyaya*, 25/15-16. Available from: https://niimh.nic.in/ebooks/esushruta. (Accessed on 06 June 2021)
[2] Vagbhatta, Ashtanga Hridayam, Vidyotini Hindi commentary by Kaviraja Atrideva Gupta. Uttarasthana, Reprint Edition, Chaukhambha Prakashan, Varanasi 2010, chapter 23, verse 7-8, p.726
[3] Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018 Jan;38(1):18
[4] Burch RC, Loder S, Loder E, Smitherman TA. The prevalence and burden of migraine and severe headache in the United States: updated statistics from government health surveillance studies. Headache. 2015 Jan;55(1):21-34.
[5] Steiner TJ, Stovner LJ, Jensen R, Uluduz D, Katsarava Z. Migraine remains second among the world's causes of disability, and first among young women: findings from GBD2019. J Headache Pain. 2020 Dec;21(1):137.
[6] Pavone E, Banfi R, Vaiani M, Panconesi A. Patterns of triptans use: a study based on the records of a community pharmaceutical department. Cephalalgia. 2007 Sep;27(9):1000-4.
[7] Vagbhatta, Ashtanga Hridayam, Vidyotini Hindi commentary by Kaviraja Atrideva Gupta. Sutrasthana, Reprint Edition, Chaukhambha Prakashan, Varanasi 2010, chapter 20, verse 1, p. 172.

[8] Shri Govind Das, Bhaishajya Ratnavali, Vidyotini Hindi commentry by Ambikadatta Shastri. Revised Edition, Chaukhambha Sanskrit Sansthan, Varanasi 2005, chapter 64, verse 264-270, p. 1014.
[9] Charaka Samhita, Sutrasthana, *Kiyantahshirasiyaadhyaya*, 17/11. Available from: https://niimh.nic.in/ebooks/ecaraka. (Accessed on 06 June 2021)
[10] Sushruta Samhita, Uttaratantra, *Shirorogapratishedhaadhyaya*, 26/43-44. Available from: https://niimh.nic.in/ebooks/esushruta. (Accessed on 07 June 2021)
[11] Sharangdhara, Sharangdhara Samhita, Jiwanprada Hindi commentary by Dr. Smt. Shailaja Srivastava, Madhyam Khanda, Reprint Edition, Chaukhamba Orientalia, Varanasi 2011, chapter 2, verse 145-147, p. 157.
[12] Stewart WF, Lipton RB, Dowson AJ, Sawyer J. Development and testing of the Migraine Disability Assessment (MIDAS) Questionnaire to assess headache-related disability. Neurology. 2001;56(6 Suppl 1):S20-8.
[13] Evans RW, Mathew NT. Handbook of Headache. 2nd edition, Philadelphia: Lippincott Williams and Wilkins; 2005, Chapter 2, Migraine; p. 52.
[14] Charaka Samhita, Sutrasthana, *Vatakalaakaliyaadhyaya*, 12/8. Available from: https://niimh.nic.in/ebooks/ecaraka. (Accessed on 07 June 2021)
[15] Charaka Samhita, Sutrasthana, *Snehaadhyaya*, 13/14. Available from: https://niimh.nic.in/ebooks/ecaraka. (Accessed on 06 June 2021)
[16] Vagbhatta, Ashtanga Hridayam, Vidyotini Hindi commentary by Kaviraja Atrideva Gupta. Sutrasthana, Reprint Edition, Chaukhambha Prakashan, Varanasi 2010, chapter 29, verse 6, p. 215.
[17] Goadsby PJ, Holland PR, Martins-Oliveira M, Hoffmann J, Schankin C, Akerman S. Pathophysiology of Migraine: A Disorder of Sensory Processing. Physiol Rev. 2017 Apr;97(2):553-622.
[18] Misra A, Kher G. Drug delivery systems from nose to brain. Curr Pharm Biotechnol. 2012 Sep;13(12):2355-79.
[19] Sushruta Samhita, Sutrasthana, *Jalaukavacharaniyaadhyaya*, 13/4. Available from: https://niimh.nic.in/ebooks/esushruta. (Accessed on 07 June 2021)
[20] Sig AK, Guney M, Uskudar Guclu A, Ozmen E. Medicinal leech therapy-an overall perspective. Integr Med Res. 2017 Dec;6(4):337-343.