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Comparative clinical study of *Nasya Karma* and *Shirodhara* with *Prapaundarikadi Taila* in *Ardhavabhedaka* w.s.r. to Migraine

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ABSTRACT

Background: *Ardhavabhedaka* is a type of *Shiroroga* with the cardinal feature of unilateral headache, which if left untreated leads to complications like blindness and hearing loss. This disease can be correlated to Migraine head-ache based on the clinical manifestations. *Nasya Karma* and *Shirodhara* are the prime treatment modalities for Shirorogas. **Objectives:** To evaluate the effects of *Nasyakarma* and *Shirodhara* in the management of *Ardhavabhedhaka*. **Material and Methods:** Patients presenting with the classical features of *Ardhavabhedaka* and between the age group of 18 to 60 years irrespective of sex were selected and allotted in Group A and B with 20 patients in each group. Group A was administered with *Nasya* with *Prapaundarikadi Taila* and Group B with *Shirodhara* with *Prapaundarikadi Taila* for 7 days. **Result:** Data was tabulated and analyzed using Student t-test, paired proportion test, which showed marked improvement in patients with *Ardhavabhedaka* in both the groups. *Nasya* and *Shirodhara* with *Prapaundarikadi Taila* is proved effective in all patients. According to percentage wise relief in the symptoms of *Ardhavabhedaka* in Group A and B, Group A showed comparatively better relief. **Conclusion:** On the basis of the results of this study, it can be clearly concluded that *Nasya* performed with *Prapaundarikadi Taila* provided significant relief in the signs and symptoms of *Ardhavabhedaka* than *Shirodhara* performed with *Prapaundarikadi Taila.*

Key words: *Migraine, Ardhavabhedaka, Prapaundarikadi Taila, Nasya, Shirodhara.*

INTRODUCTION

Shiras (head) is considered as the *Utthamanga* of the body because it is seat of *Prana* and the *Indriyas*. So the diseases pertaining to the *Shiras* should be treated with utmost care.[1] The diseases in which headache is the prime symptom are grouped under *Shirorogas*. *Ardhavabhedaka* is one type of *Shiroroga* which has been mentioned by almost all the *Acharyas*.

The causes for *Ardhavabhedaka* are excessive intake of *Rukshapadarthas*, *Adhyashana, Purvavatasevana, Atimaithuna* (excessive coitus), *Vegadharna* (suppressing of natural urges), *Athishrama* (excessive work) in which pain is appreciable in one half of the *Shiras*, *Shanka, Bru, Kapala*, and in *Karna Pradesha.*[2] The attacks of *Ardhavabhedaka* will be once in three days, once in fifteen days or once in a month as per classics. *Ardhavabhedaka* if left untreated leads to complications like deafness and blindness. Hence an early intervention is needed for *Ardhavabhedaka*. It can be correlated with migraine based on the similarity in etiology, pathology, symptoms.

The headache is mainly classified into primary and secondary types of Headaches. Migraine is one among the most common complaint encountered in

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neurology practice. Migraine being a type of primary headache is the second most common cause of headache that afflicts 15% of the women and 6% of men. It is usually an episodic headache that is associated with certain features such as sensitivity to light, smell or movement, other features like nausea, vomiting.[3]

Migraine doesn't shorten the life, but in severe cases a state of chronic exhaustion may occur. Very rarely persistent cerebral symptoms with some irreversible vascular changes have occurred. The negative impact of migraine on quality of life, families and even work productivity is significant and often underated as a serious complication. Though migraine treatment and preventive strategies have greatly improved there is enormous gap between the treatment that is available and the treatment that is actually delivered for migraine. Therefore a better understanding of migraine and the development of better therapeutic alternatives are required.

Ayurveda has mentioned various therapeutics in the management of *Ardhavabedaka* where *Nasya Karma* and *Shirodhara* both are considered as prime treatment modalities in all types of *Shirorogas*.[4]

In *Astanga Hridaya* there is an indication of *Prapaundarikadi Taila*[5] for *Shirashoola*. By looking into the individual herbal constituents of *Prapaundarikadi Taila*, it appears that these combinations may be very effective in relieving the science and symptoms associated to *Ardhavabedhaka*.

Hence the study entitled – "A Comparative clinical study of *Nasya Karma* and *Shirodhara* with *Prapaundarikadi Taila* in *Ardhavabedhaka* w.s.r. to Migraine" was selected with the aim to provide significant effect to improve the quality of life.

OBJECTIVES OF THE STUDY

1. To evaluate the effect of *Nasya Karma* with *Prapaundarikadhi Taila* in the management of *Ardhavabhedhaka*.
2. To evaluate the effect of *Shirodhara* with *Prapaundarikadhi Taila* in the management of *Ardhavabhedhaka*.
3. To compare the effects of *Nasyakarma* and *Shirodhara* in the management of *Ardhavabhedhaka*.

MATERIALS AND METHODS

Source of data

Patients for the present study were selected from out patient department and in patient department of RAMCH & RC and from various camps conducted by RAMCH & RC Bangalore.

Method of collection of data

Patients who fulfilled the criteria for diagnosis and inclusion were selected for the present study irrespective of sex.

Diagnostic Criteria

According to International Headache Society

1. At least 5 attacks fulfilling the following criteria 'b to d'
2. Headache attacks lasting 4-72 hours.
3. It must have at least one of the following symptoms
   a. Pain in one side of the head
   b. Pulsating or throbbing type of pain
   c. Pain severe enough to impair daily activities
   d. Pain intensified by exertion such as walking
4. During attack one or more of the following symptoms
   a. Nausea or vomiting
   b. Photophobia or Phonophobia

Inclusion Criteria

- Patients diagnosed with *Ardhavabhedaka* aged between 18 to 50 years.
- Patients with chronicity with > 3 months
- Either sex
- Patients fit for *Nasya Karma* and *Shirodhara*

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Exclusion Criteria

- Migraine with aura.
- Severe depression or psychiatric disorders.
- Sinusitis, cluster headache, trigeminal neuralgia.
- Headache arising due to malignancy.
- Pregnant lady, lactating mother.
- *Suryavartha, Ananthavata, Adhimantha*

Treatment Group

40 patients of *Ardhavabhedaka* (Migraine) fulfilling the criteria for inclusion were randomly selected and divided 2 groups (Group A & Group B) of 20 patients each. Group A were subjected to *Prapaundarikadi Taila Nasya* once daily in the morning for a period of seven days and Group B subjected to *Shirodhara* for 7 days and evaluated after 7, 14 and 21 days.

Assessment Criteria

Assessment was done on the basis of improvement in symptoms.

Patients were assessed with subjective parameters formulated for *Ardhvabhedaka* w.s.r. to migraine before and after treatment.

Subjective Parameters

a. Severity of pain

b. Duration of pain

c. Frequency of attack

d. Nausea

e. Vomiting

f. Phonophobia

g. Photophobia

Study Design

The patients of either gender of the age 18 years and above fulfilling the diagnostic, inclusion and exclusion criteria were selected for the study. The selected patients were divided into 2 groups A and B with 20 patients in each group. 20 patients were treated with *Nasya* and 20 patients were treated with *Shirodhara* for duration of 45 minutes for 7days.

Nasya (Group A)

Poorva Karma

- *Stanika Abhyanga* with *Murchita Tila Taila.*
- *Swedana* with *Nadi Sweda* on *Jatrudhwa Pradesha*

Pradhana Karma

- *Prapaundarikadhi Taila* is administered
- Dose - 8 *Bindus* each nostril

Paschath Karma

- *Gandhusa* with *Ushna Jala*
- *Haridra Varti Dhoomapana*
- *Laghu Ahara*

Shirodhara (Group B)

Poorva Karma

- *Abhyanga* to head and body with *Murchita Tila Taila*, eyes and ears covered with cotton.

Pradhana Karma

- *Prapaundarikadhi Taila* is poured continuously and slowly on the forehead of the patient with mild oscillation for 45 minutes.

Paschath Karma

- Oil from head removed
- Eyes washed with cold water
- Rest, Hot water bath

Assessment Criteria

- Effect of the therapies was assessed by the symptoms before and after the treatment
- It was done on the basis of grading.

Assessment criteria for *Ardhavabhedaka*

1) Severity of Pain

- Grade 3 = Unable to perform activities like walking

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- Grade 2 = Disturbs the normal work
- Grade 1 = Does not disturb the normal work
- Grade 0 = No pain

2) Duration of pain

- Grade 3 = >12 hr
- Grade 2 = 6 to 12 hr
- Grade 1 = 4 to 6hr
- Grade 0 = No pain

3) Frequency of Attack

- Grade 3 = 1-5 days
- Grade 2 = 6-10 days
- Grade 1 = >10 days
- Grade 0 = Absent

4) Nausea

- Grade 3 = Present and it disturbs the normal work
- Grade 2 = Present but does not disturb the normal work
- Grade 1 = Occasionally
- Grade 0 = No nausea

5) Vomiting

- Grade 3 = More than 6 episodes and forced to take medicine to stop vomiting
- Grade 2 =2 to 5 episodes
- Grade 1 = 1 to 2 episodes
- Grade 0 = None

6) Photophobia

- Grade 3 = Unable to resist dim light
- Grade 2 = Unable to resist normal light
- Grade 1 = Unable to resist bright light
- Grade 0 = No photophobia

7) Vertigo

- Grade 3 = Vertigo in which patient gets blacking
- Grade 2 = Patient feels as if surrounding is revolving
- Grade 1 = Feels giddiness
- Grade 0 = No vertigo

8) Phonophobia

- Grade 3 = Irresistant to low intensity sound
- Grade 2 = Unable to resist normal sound
- Grade 1 = Unable to resist loud sound
- Grade 0 = No Phonophobia

Statistical Analysis

- SPSS Version - 22.0 & R environment ver.3.2.2
- Student t test (two tailed, independent) - to find the significance of study parameters.
- Chi-square / Fisher exact test - to find significance of study parameters on categorical scale between two groups.
- Paired proportion test - to find the significance of proportion in paired data.

OBSERVATIONS AND RESULTS

In the present study, 40 patients fulfilling the inclusion criteria of *Ardhavabhedhaka* were studied. Group A was treated with *Nasya* and Group B was treated with *Shirodhara*.

Age: In this study, the incidence of migraine was found to be higher in the age group between 18-30 years which was 57.5% and minimum was in the age group of 41-60 years which was 7%.

Gender: In this study, the incidence of *Ardhavabhedaka* was found to be higher in females with 65% patients and 35% in males.

Religion: In this study, the incidence of *Ardhavabhedaka* was found to be higher in Hindus with 85%, Christians with 2.5% and Muslims with 12.5%.

Education status: In this study, the incidence of *Ardhavabhedhaka* was found to be maximum in samples who are literates with 97%.

Socio-Economic status: In this study the incidence of *Ardhavabhedaka* was found to be higher in samples of

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middle class with 65% and less in samples of lower class with 7.5%.

Marital status: In this study, the incidence of *Ardhavabhedaka* was found to be high in married samples with 55.% while in unmarried it was 45%.

Occupation: In this study, the incidence of *Ardhavabhedaka* was found to be maximum in students with 40% and other professionals with 22.5% and in housewives with 15%.

Family history: The observation on family history in the study shows maximum samples that is 77.5% had no history of Migraine in family while 22.5% of the samples had history of migraine in family.

Chronicity of disease: The observation on chronicity of disease in the study show maximum chronicity of 1-3 years with 60% of samples, 25% having 4-6 years and minimum of 15% having 7-10 years of chronicity.

Prakriti: The observations in the sample in the study shows 40% were *Vata-Kapha Prakriti,* 30% were *Vata-Pitta Prakriti* and 30% were *Kapha-Pitta Prakriti.*

Treatment History: The observations in the sample in the study shows maximum samples i.e. 62.5% were taking anti migraine drugs, 20% were taking pain killers and minimum samples 17.5% had no habit of taking medicines.

Nausea: 62.5% of patients had nausea as the associated symptom and 37.5% had no complaints of nausea.

Vomiting: On observation of the symptoms 35% had vomiting as the associated symptoms and 65% had no complaints of vomiting

Photophobia: 92.5% of the patients had photophobia as the associate symptoms and remaining 7.5% didn't have.

Phonophobia: 85% of the patients had photophobia as the associate symptoms and remaining 15% didn't have.

Effect of *Nasya* on Severity of Pain

Before treatment the number of patients having Grade 3 of severity of pain (*Threvratha* of *Vedhana*) was 35% Grade 2 in 60% Grade 1 in 5% and Grade 0 in 0% of the patients . After the 7days of *Nasya* Grade 3 was not seen in any of the patients. Grade 2 was found in 20% Grade 1 was found in 10% and Grade 0 was found in 70% of the patients. At 14th day of follow up, Grade 1 was seen in 50% and Grade 0 was seen in 50%. While at 21st day of follow up Grade 2 was seen in 10% Grade 1 was seen in 55% and Grade 0 was seen in 35%.

Table 1: Effect of *Nasya* on *Teevrata* of *Vedhana* in Group A.

Teevrata* of *Vedhana	**Before Treatment**	**At 7th day**	**F1 14th day**	**F2 21st day**	**% difference**
0	0 (0%)	14 (70%)	10 (50%)	7 (35%)	35.0%
1	1 (5%)	2 (10%)	10 (50%)	11 (55%)	50.0%
2	12 (60%)	4 (20%)	0 (0%)	2 (10%)	-50.0%
3	7 (35%)	0 (0%)	0 (0%)	0 (0%)	-35.0%
n=20, Group A: Improvement of 85% at 0 &1 grade is significant with P<0.001**, paired Proportion test					

Effect of *Shirodhara* on *Teevrata* of *Vedana*

Before treatment the number of patients having Grade 3 of severity of pain (Threvratha of Vedhana) was 45% , Grade 2 in 50% ,Grade 1 in 5% and Grade 0 in 0% of the patients . After the 7days of Shirodhara Grade 3 was not seen in any of the patients. Grade 2 was found in 35%, Grade 1 was found in 25% and Grade 0 was found in 40% of the patients. At 14th day of follow up, Grade 3 was seen in 5%, Grade 2 was seen in 15% and Grade 1 was seen in 45% and Grade 0 was seen in 35%. While at 21st day of follow up Grade 2 was seen in 25%, Grade 1 was seen in 65% and Grade 0 was seen in 10%.

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Table 2: Effect of *Shirodhara* on *Teevrata* of *Vedana* in Group B.

Teevrata of *Vedhana*	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0(0%)	8 (40%)	7 (35%)	2 (10%)	10.0%
1	1 (5%)	5 (25%)	9 (45%)	13 (65%)	60.0%
2	10 (50%)	7 (35%)	3 (15%)	5 (25%)	-25.0%
3	9 (45%)	0 (0%)	1 (5%)	0 (0%)	-45.0%
n=20, Group B: Improvement of 70% at 0 &1 grade is significant with P<0.001**, paired Proportion test					

Effects of *Nasya* on *Vedana Pravritti Kala*

Before treatment the number of patients having Grade 3 of Duration of Attack (*Vedana Pravritti Kala*) was 35%, Grade 2 in 20%, Grade 1 in 45% and Grade 0 in 0% of the patients. After the 7days of *Nasya* Grade 3 was not seen in any of the patients. Grade 2 was found in 25%, Grade 1 was found in 5% and Grade 0 was found in 70% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 5% and Grade 1 was seen in 50% and Grade 0 was seen in 45%. While at 21st day of follow up Grade 2 was seen in 10%, Grade 1 was seen in 40% and Grade 0 was seen in 50%.

Table 3: Effect of *Nasya* on *Vedana Pravruti Kala* in Group A.

Vedana Pravruti Kala	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	14 (70%)	9 (45%)	10 (50%)	50.%
1	9 (45%)	1 (5%)	10 (50%)	8 (40%)	-5.0%
2	4 (20%)	5 (25%)	1(5%)	2(10%)	-10.0%
3	7 (35%)	0 (0%)	0 (0%)	0 (0%)	-35.0%
n=20, Group A: Improvement of 50.0% at 0 &1 grade is significant with P=0.038*, paired Proportion test					

Effect of *Shirodhara* on *Vedana Pravritti Kala*

Before treatment the number of patients having Grade 3 of Duration of Attack (*Vedana Pravritti Kala*) was 45%, Grade 2 was seen in 15%, Grade 1 in 40% and Grade 0 in 0% of the patients . After the 7days of *Shirodara* Grade 3 was not seen in any of the patients. Grade 2 was found in 45%, Grade 1 was found in 15% and Grade 0 was found in 40% of the patients. At 14th day of follow up, Grade 3 was seen in 5%, Grade 2 was seen in 15% and Grade 1 was seen in 45% and Grade 0 was seen in 35%. While at 21st day of follow up Grade 3 was seen in 10%, Grade 2 was seen in 20%, Grade 1 was seen in 60% and Grade 0 was seen in 10%.

Table 4: Effect of *Shirodhara* on *Vedana Pravritti Kala* in Group B.

Vedana Pravruti Kala	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	8 (40%)	7 (35%)	2 (10%)	10.0%
1	8 (40%)	3 (15%)	9 (45%)	12 (60%)	20.0%
2	3 (15%)	9 (45%)	3 (15%)	4 (20%)	5.0%
3	9 (45%)	0 (0%)	1 (5%)	2 (10%)	-35.0%
n=20, Group B: Improvement of 30.0% at 0 &1 grade is significant with P=0.099+, paired Proportion test					

Effects of *Nasya* on Frequency of Attack

Before treatment the number of patients having Grade 3 of Frequency of Attack was 30%, Grade 2 in 25%, Grade 1 in 45% and Grade 0 in 0% of the patients. After the 7days of *Nasya* Grade 3 was not seen in any of the patients. Grade 2 was found in 25%, Grade 1 was found in 20% and Grade 0 was found in 55% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 15% and Grade 1 was seen in 25% and Grade 0 was seen in 60%. While

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at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 10%, Grade 1 was seen in 45% and Grade 0 was seen in 45%.

Table 5: Effect of *Nasya* on Frequency of Attack in Group A.

Frequency of Attack	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	11 (55%)	12 (60%)	9 (45%)	45.0%
1	9 (45%)	4 (20%)	5 (25%)	9 (45%)	0.0%
2	5 (25%)	5 (25%)	3 (15%)	2 (10%)	-15.0%
3	6 (30%)	0 (0%)	0 (0%)	0 (0%)	-30.0%
n=20, Group A: Improvement of 45.0% at 0 grade is significant with P<0.001**, paired Proportion test					

Effects of *Shirodhara* on Frequency of Attack

Before treatment the number of patients having Grade 3 of Frequency of Attack was 35%, Grade 2 was seen in 25%, Grade 1 in 40% and Grade 0 in 0% of the patients. After the 7days of *Shirodara* Grade 3 was not seen in any of the patients. Grade 2 was found in 40%, Grade 1 was found in 30% and Grade 0 was found in 30% of the patients. At 14th day of follow up, Grade 3 was seen in 5%, Grade 2 was seen in 15% and Grade 1 was seen in 35% and Grade 0 was seen in 45%. While at 21st day of follow up Grade 3 was seen in 5%, Grade 2 was seen in 20%, Grade 1 was seen in 60% and Grade 0 was seen in 15%.

Table 6: Effects of *Shirodhara* on Frequency of Attack in Group B.

Frequency of Attack	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0(0%)	6 (30%)	9 (45%)	3 (15%)	15.0%
1	8(40%)	6 (30%)	7 (35%)	12 (60%)	20.0%
2	5(25%)	8 (40%)	3 (15%)	4(20%)	-5.0%
3	7(35%)	0(0%)	1(5%)	1(5%)	-30.0%
n=20, Group B: Improvement of 35.0% at 0 &1 grade is significant with P=0.067+, paired Proportion test					

Effects of *Nasya* on Nausea

Before treatment the number of patients having Grade 3 of Nausea was seen in 30%, Grade 2 in 55%, Grade 1 in 15% and Grade 0 in 0% of the patients. After the 7days of *Nasya* Grade 3 was not seen in any of the patients. Grade 2 was found in 15%, Grade 1 was found in 25% and Grade 0 was found in 60% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 0% and Grade 1 was seen in 45% and Grade 0 was seen in 55%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 0%, Grade 1 was seen in 50% and Grade 0 was seen in 50%.

Table 7: Effects of *Nasya* on Nausea in Group A.

Nausea	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	12 (60%)	11 (55%)	10 (50%)	50.0%
1	3 (15%)	5 (25%)	9 (45%)	10 (50%)	-35.0%
2	11 (55%)	3 (15%)	0 (0%)	0 (0%)	-55.0%
3	6 (30%)	0 (0%)	0 (0%)	0 (0%)	-30.0%
n=20, Group A: Improvement of 80.0% at 0 grade is significant with P<0.001**, paired Proportion test					

Effects of *Shirodhara* on Nausea

Before treatment the number of patients having Grade 3 of Nausea was 30%, Grade 2 was seen in 60%, Grade 1 in 10% and Grade 0 in 0% of the patients. After the 7days of *Shirodara* Grade 3 was not seen in any of the patients. Grade 2 was found in 30%, Grade 1 was found in 35% and Grade 0 was found in 35% of the patients. At 14th day of follow up, Grade 3 was

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seen in 0%, Grade 2 was seen in 15% and Grade 1 was seen in 40% and Grade 0 was seen in 45%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 10%, Grade 1 was seen in 50% and Grade 0 was seen in 40%.

Table 8: Effects of *Shirodhara* on Nausea in Group B.

Nausea	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0(0%)	7(35%)	9(45%)	8(40%)	40.0%
1	2(10%)	7(35%)	8(40%)	10(50%)	40.0%
2	12(60%)	6(30%)	3(15%)	2(10%)	-50.0%
3	6(30%)	0(0%)	0(0%)	0(0%)	-30.0%
n=20, Group B: Improvement of 50.0% at 0 &1 grade is significant with P<0.001**, paired Proportion test.					

Effects of *Nasya* on Vomiting

Before treatment the number of patients having Grade 3 of Vomiting was seen in 0%, Grade 2 in 40%, Grade 1 in 15% and Grade 0 in 9% of the patients. After the 7days of *Nasya*, Grade 3 was not seen in any of the patients. Grade 2 was found in 0%, Grade 1 was found in 25% and Grade 0 was found in 75% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 0% and Grade 1 was seen in 5% and Grade 0 was seen in 95%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 0%, Grade 1was seen in 15% and Grade 0 was seen in 85%.

Table 9: Effects of *Nasya* on Vomiting in Group A.

Vomiting	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	9 (45%)	15 (75%)	19 (95%)	17 (85%)	40.0%
1	3 (15%)	5 (25%)	1(5%)	3 (15%)	0.0%
2	8 (40%)	0 (0%)	0(0%)	0 (0%)	-40.0%
3	0 (0%)	0 (0%)	0(0%)	0 (0%)	0.0%
n=20, Group A: Improvement of 45% at 0 grade is significant with P=0.055+, paired Proportion test					

Effects of *Shirodhara* on Vomiting

Before treatment the number of patients having Grade 3 of Vomiting was 0%, Grade 2 was seen in 30%, Grade 1 in 30% and Grade 0 in 40% of the patients. After the 7days of *Shirodhara* Grade 3 was not seen in any of the patients. Grade 2 was found in 10%, Grade 1 was found in 30% and Grade 0 was found in 60% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 0% and Grade 1 was seen in 20% and Grade 0 was seen in 80%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 0%, Grade 1 was seen in 15% and Grade 0 was seen in 85%.

Table 10: Effects of *Shirodhara* on Vomiting in Group B.

Vomiting	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	8 (40%)	12 (60%)	16 (80%)	17 (85%)	45.0%
1	6 (30%)	6 (30%)	4 (20%)	3 (15%)	-15.0%
2	6 (30%)	2 (10%)	0 (0%)	0 (0%)	-30.0%
3	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.0%
n=20, Group B: Improvement of 40% at 0 grade is significant with P=0.032+, paired Proportion test					

Effects of *Nasya* on Photophobia

Before treatment the number of patients having Grade 3 of Photophobia was seen in 20%, Grade 2 in 45%, Grade 1 in 35% and Grade 0 in 0% of the patients. After the 7days of *Nasya*, Grade 3 was seen in 5%, Grade 2 was found in 15%, Grade 1 was found in 20% and Grade 0 was found in 60% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 0% and Grade 1 was seen in 40% and Grade 0 was seen in 60%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen

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in 0%, Grade 1was seen in 40% and Grade 0 was seen in 60%.

Table 11: Effects of *Nasya* on Photophobia in Group A.

Photophobia	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	12 (60%)	12 (60%)	12 (60%)	60.0%
1	7 (35%)	4 (20%)	8 (40%)	8 (40%)	5.0%
2	9 (45%)	3 (15%)	0 (0%)	0 (0%)	-45.0%
3	4 (20%)	1 (5%)	0 (0%)	0 (0%)	-20.0%

n=20, Group A: Improvement of 65.0% at 0 &1 grade is significant with P=0.003**, paired Proportion test

Effects of *Shirodhara* on Photophobia

Before treatment the number of patients having Grade 3 of Photophobia was 20% , Grade 2 was seen in 45% ,Grade 1 in 35% and Grade 0 in 0% of the patients . After the 7days of Shirodara Grade 3 was not seen in any of the patients. Grade 2 was found in 15%, Grade 1 was found in 45% and Grade 0 was found in 40% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 5% and Grade 1 was seen in 50% and Grade 0 was seen in 45%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 0%, Grade 1 was seen in 60% and Grade 0 was seen in 40%.

Table 12: Effects of *Shirodhara* on Photophobia in Group B.

Photophobia	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	8 (40%)	9 (45%)	8 (40%)	40.0%
1	7 (35%)	9 (45%)	10 (50%)	12 (60%)	25.0%
2	9 (45%)	3 (15%)	1 (5%)	0 (0%)	-45.0%
3	4 (20%)	0 (0%)	0 (0%)	0 (0%)	-20.0%

n=20, Group B: Improvement of 65.0% at 0&1 grade is significant with P=0.003**, paired Proportion test

Effects of *Nasya* on Phonophobia

Before treatment the number of patients having Grade 3 of Phonophobia was seen in 15%, Grade 2 in 40%, Grade 1 in 45% and Grade 0 in 0% of the patients. After the 7days of *Nasya*, Grade 3 was seen in non of the patients. Grade 2 was found in 10%, Grade 1 was found in 20% and Grade 0 was found in 70% of the patients. At 14th day of follow up, Grade 3 was seen in 0%, Grade 2 was seen in 0% and Grade 1 was seen in 30% and Grade 0 was seen in 70%. While at 21st day of follow up Grade 3 was seen in 0%, Grade 2 was seen in 0%, Grade 1was seen in 45% and Grade 0 was seen in 55%.

Table 13: Effects of *Nasya* on Phonophobia in Group A.

Phonophobia	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	14 (70%)	14 (70%)	11 (55%)	55.0%
1	9 (45%)	4 (20%)	6 (30%)	9 (45%)	0.0%
2	8 (40%)	2 (10%)	0 (0%)	0 (0%)	-40.0%
3	3 (15%)	0 (0%)	0 (0%)	0 (0%)	-15.0%

n=20, Group A: Improvement of 55% at 0 grade is significant with P=0.0003**, paired Proportion test

Effects of *Shirodhara* on Phonophobia

Before treatment the number of patients having Grade 3 of Photophobia was 15%, Grade 2 was seen in 45%, Grade 1 in 40% and Grade 0 in 0% of the

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Table 14: Effects of *Shirodhara* on Phonophobia in Group B.

Phonophobia	Before Treatment	At 7th day	F1 14th day	F2 21st day	% difference
0	0 (0%)	8 (40%)	10 (50%)	7 (35%)	35.0%
1	8 (40%)	8 (40%)	8 (40%)	12 (60%)	20.0%
2	9 (45%)	4 (20%)	2 (10%)	1 (5%)	-40.0%
3	3 (15%)	0 (0%)	0 (0%)	0 (0%)	-15.0%
n=20, Group B: Improvement of 55% at 0 & 1 grade is significant with P=0.0135*, paired Proportion test					

DISCUSSION

Ardhavabhedaka is a *Shiroroga* which is occurring due to *Nidanas* like *Rathri Jagarana*, *Manahsanthapa*, *Adhyasana*, *Anasana* leading to severe breaking type of pain in half of the head associated with other features. Based on the etiology and symptoms *Ardhavabhedaka* can be correlated to migraine. Migraine is one of the most common as well as painful of the chronic pain disorders of head.

Intensity of pain

The result of Intensity of pain (*Teevratha* of *Vedana*) in both group showing statistically significant result individually which indicates both the group A & B are effective.

Percentage wise relief of symptom in Group A (85%) is better than Group B (70%).

Nidanas of *Ardhavabedhaka* show that there will be vitiation of *Tridoshas*. The constituents used in the *Taila* are *Tridosha Shamakas* and there by relives pain. Serotonin uptake inhibitor helps to bring serotonin to the synapses. Thereby maintains regular contraction of blood vessels and proper neurological transmission is maintained.

Duration of Pain

The result on Duration of pain (*Vedana Pravritti Kala*) in Group A is showing statistically significant effect of 50% which indicates group A has better effects than Group B (30%).

As the drug is directly acting on the *Shiras* by the *Nasyakarma*, the local effect is attained there by the duration of pain is decreased. Bioavailability of the drug enhanced by lipid media which is proven to cross Blood Brain Barrier producing a sustained action of the drug. Hence the reduced duration is seen in Group A.

Frequency of the attack

The result of Frequency of attack in Group A is showing statistically significant effect of 45% which indicates group A has better effects than Group B (35%).

The *Snigdha* and *Jeevaneeya* action of the drug imparts the *Sthirathwam* and thereby the frequency is decreased to some extent in both the groups.

Effect on Nausea and Vomiting

The result of Nausea in Group A is showing statistically significant effect of 80% which indicates group A has better effects than Group B (50%).

The result of vomiting in both group showing statistically significant result individually which indicates both the group A & B are effective.

Percentage wise relief of symptom in Group A (45%) is better than Group B (40%).

Shiras is the seat of *Pranavayu*. When *Pitta Dosha* does the *Avarana* of this *Pranavata* there will be vomiting. The same pathology might have occurred here also. *Nasya Karma* with *Ghritha* processed with

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Nirgundi may have corrected the *Avarana*. Once the pain is subsided by the proper transmission of neurological impulses, the hyper excited sympathetic nerves might have become normal and thus the nauseacontrolled.

Photophobia

The result on Photophobia in both group showing statistically significant results equally i.e. percentage improvemwnt in both the Groups A & B is 65% which indicates both the group A & B are equally effective.

This may have occurred due to the *Vataprakopa* and *Rasa Dusti.* So *Prapaunadarikadi Taila* used for treatment may have brought shamana to the *Prakupitavata*.

Phonophobi

The result on Photophobia in both group showing statistically significant results equally i.e. percentage improvement in both the Groups A & B is 55% which indicates both the group A & B are equally effective. This may have occurred due to the *Vataprakopa* and *Rasa Dusti*. So *Prapaunadarikadi Taila* used for treatment may have brought *Shamana* to the *Prakupitavata*.

Probable mode of action of *Nasya Karma*

Penetration of blood brain barrier: Intra nasal delivery provides a practical, non invasive method of by passing the blood brain barrier (BBB) to deliver therapeutic agents to the brain and spinal chord. This is possible because of the unique connections that the olfactory and trigeminal nerves provide between the brain and external environment.[6]

Reaches brain in < 10 minutes: Extra cellular delivery, rather than axonal transport, is strongly indicated by the short time frame < 10 minute observed for intra nasal therapeutics to reach the brain from the nasal mucosa**.** Possible mechanism of transport may involve bulk flow and diffusion within perineural channels, perivascular spaces or lymphatic channels directly connected to brain tissues or cerebrospinal fluid.[7]

Lipophilic substances cross BBB: There is a good correlation between the lipid solubility of a drug and the blood brain barrier penetration in humans. The Lipophilic pathways also provides a large surface area for drug delivery. These tight endothelium junctions of BBB can be 100 times tighter than the junctions of other capillary endothelium. Thus, the barrier has many properties similar to a continuous cell membrane, allowing lipid soluble molecules transport across the membrane where hydrophilic solutes demonstrate minimal permeation.[8]

Increased bio availability: Intra nasal route administration , bio availability is usually higher than orally. This bio availability occurs due to the quick absorption of molecules into the blood stream through the soft tissues in the mucus membrane of the sinus cavity.

Constituents of *Prapaundarikadi Taila* having the properties of *Tridoshahara* and also it is having properties like *Indriya Balavridhikara, Rasayana* and indicated for *Nasya* in *Shiroroga*.[9]

Discussion on *Shirodhara*

In the treatment of *Vatika Shirahshoola, Acharya Sushruta* and *Vagbhata* have mentioned *Shirodhara*, *Ardhavabheka* is *Shoola Pradhana Vyadi* and there will be involvement of *Vata Dosha* predominantely. *Shirodhara* is a safe and effective, treatment, hence it was selected for the study. It was also selected to evaluate whether the procedural effect or the therapeutic effect of the medicament is acting in this disease.

Probable mode of action of *Shirodhara*

Shirodhara is effective in following two ways;

1. Therapeutic effect of medicaments
2. Procedural effect of the process

Therapeutic effect of medicament

The therapeutic effect is partially attributed to the medicaments viz. the medicated oil, *Ghrita*, butter milk, *Kwatha* etc. which exchange through the fine pores present over the scalp and forehead. As it is said by *Acharya Susrutha* that that the effect and potencies of the articles of *Abhyanga, Parisheka, Udvartana*, etc. which are digested by the skin, enter

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into the *Shareera* through the orifices present in the skin. The modern physiology and biochemistry say that it is possible to produce a certain amount of absorption by the application of substances conveyed in fatty vehicles.

PROCEDURAL EFFECT

Stimulatory Effect

Bhrumadhya is the area which corresponds to that external anatomy over the forehead, which is concerned with the fundamental endocrine glands like the Pineal and Pituitary gland. In *Shirodhara*, potential energy of medicament is propagated and converted to mechanical waves to forehead. It then passes to mid brain where pineal gland lies and stimulates the secretion of Seratonin whose absence produces the disease.

Also the nerve endings of Opthalmic branch of trigeminal, facial and dermatomes are arranged over surface of frontal skin and forehead gets stimulated during *Dhara Chikitsa* and impulse is transmitted to CNS which results in the subsistence of tension, neuralgia and vascular headache.

Regulatory effect

Action of *Dhara* also mediates through tactile and thermo receptive sensations. *Shirodhara* induce tactile stimulation over forehead and may activate supra chiasmatic nuclei located in Hypothalamus and regulates the Circadian Rhythm.

Thermal effect

Warm liquid used for *Dhara* stimulate efferent vasodilator nerve and causes peripheral vasodilatation and results in increase of filtration co-efficient & lipid water co-efficient of drug.

Pressure effect

If prolonged pressure is applied to a nerve impulse conduction by that nerve is interrupted & part of body may go to sleep. In *Dhara Chikitsa*, prolonged and continuous pressure produced due to trickling of medicated liquid cause tranquility of mind and induces natural sleep.

Massage effect

Gentle massage over forehead, improves circulation to head relaxes the muscles and nerve endings. It increase fresh O2 & glucose supply to brain and increase CSF circulation around brain & spinal cord. It also increases release of hormones & enzymes by stimulating pineal & pituitary gland.

Nasya being a *Shodhana Karma* eliminates the morbid *Dosha* of *Urdhwa Jatru* and expels them from the uttamanga and nutritive part of *Nasya* is nourishes the *Shirah* (head).

Shirodhara where in continuous pouring of *Prapaundarikadi Taila* in relaxed and comfortable position has sedative and soothing effect to the brain. Also the *Taila* enters into the circulation does the *Tridoshashamana*.

Thus over all both therapies pacifie *Vata, Vata Kapha* or *Tridosa* and hence does the *Samprapti Vighatana* of *Ardhavabhedaka.*

CONCLUSION

The study showed significant results for both treatments, *Nasya* and *Shirodhara* with *Prapaundarikadi Taila* in *Ardhavabhedaka*. Both the treatments, *Nasya* and *Shirodhara* had long term effects in *Ardhavabhedaka* as the symptoms were found to reduce even during the follow up periods**.** Group treated with *Shirodhara* showed a significant reduction of symptoms by the 7th day and later even though reduction was seen, much difference was not appreciated (more of instant effect). While in the group treated with *Nasya*, relief of all the signs & symptoms was not predominant on the 7th day, but results were found better during the follow up period (more of long term effect). It was also found that there was statistically significant result seen in both the groups while comparing the symptoms before and after the treatments. However, the results obtained for *Nasya* on clinical side was encouraging when compared to *Shirodhara*. But on applying the test of significance no difference could be made out between the two procedures.

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