MANAGEMENT OF ARDHAVABHEDAKA WITH PATHYASHADANGA AND PRANAYAMA

Thesis submitted to the
Sree Sankaracharya University of Sanskrit
Kalady, Kerala
for the award of the Degree of

DOCTOR OF PHILOSOPHY IN AYURVEDA

by

M.G. RAMACHANDRAN

Under the Supervision of
Dr. JACOB THOMAS PUTHUPALLIL MD(Ay), PhD
Head of the Department, Faculty of Ayurveda

DEPARTMENT OF AYURVEDA
Sree Sankaracharya University of Sanskrit
Sree Sankarapuram, Kalady, Kerala

2011

DEPARTMENT OF AYURVEDA
SREE SANKARACHARYA UNIVERSITY OF SANSKRIT
SREE SANKARAPURAM, KALADY
KERALA

Certificate

This is to certify that this thesis embodies the outcome of original observation made by ***M.G.Ramachandran*** *on* **"MANAGEMENT OF ARDHAVABHEDAKA WITH PATHYASHADANGA AND PRANAYAMA"** *under my guidance. He has taken keen interest and brought out new ideas and original thoughts. His findings are valuable and have contributed substantially to the present knowledge on the subject.*

I strongly recommend this thesis to be forwarded to the adjudication for the acceptance as a partial fulfillment for awarding the Degree of Doctor of Philosophy in Ayurveda of the Sree Sankaracharya University, Kalady, Kerala.

Dr. JACOB THOMAS PUTHUPALLIL *MD(Ay), PhD*
Head of the Department
Faculty of Ayurveda

Declaration

I, Dr. M.G.Ramachandran, hereby declare that this thesis work entitled "**MANAGEMENT OF ARDHAVABHEDAKA WITH PATHYASHADANGA AND PRANAYAMA**" is a bonafide record of research work done me under the guidance of **Dr. JACOB THOMAS *PUTHUPALLIL*** *MD(Ay), PhD, Head of the Department, Faculty of Ayurveda,* Sree Sankaracharya University, Kalady, Kerala that no part thereof has been presented earlier for any degree / diploma or similar title of any other University.

Thrissur

Dr. M.G.Ramachandran

Acknowledgment

I enjoy the pleasure of writing this acknowledgement as it gives me opportunity to remember how meaningful each individual's contribution had been each and every person named below and many others had made an important difference to me by their direct or indirect help. Due to confinement of my vocabulary really I am failing to express my sincere gratitude towards all of them. However I try to owe and express my sense of gratitude towards them with the few words, which I know.

I extend my deepest sense of gratitude and indebtedness to my honourable guide **Dr. Jacob Thomas puthupallil** *MD(Ay), PhD, Head of the Department of Ayurveda, Sree Sankaracharya University of Sanskrit, Kalady for his expert guidance, supervision, advice, motivational inspiration, encouragement and kind co-operation extended throughout the study.*

I owe a special debt of gratitude to my respected Dr. Rajagopalan DAM, MBBS for his scientific advice, constructive suggestions, constant encouragement and guidance given from time to time while carrying out the research work.

I am obliged to Dr. E.T. Narayanan Mooss, Manager, Vaidyaratnam Ayurveda College, Thaikkattussery for his kind co-operation extend.

I shall remain indebted to my teacher Dr. R.Vijayakumar Varma MD(Ay) for the valuable guidance and critical suggestions given, regarding the discussion of the subject.

I am indebted to my teacher Dr. P.V.Prasanna, Former Principal, Vaidyaratnam Ayurveda College, Thaikkattussery for their suggestions and favours.

I shall remain idebited to Dr. Anandan MBBS, DLO for the valuable guidance and critical suggestions given regarding the discussion of the subject.

My sincere thanks are to Dr. T.Sreekumar MD(Ay), PhD, Associate Professor, Dept. of Kriyasareera, Vaidyaratnam Ayurveda College,Thaikkattussery for his kind co-operation and wealth of experience provided, which helped me considerably in the research work.

I am ever indebted to my friends Dr. B.Syamala MD(Ay), PhD, Dr. Iqbal MD(Ay),PhD and Dr. P.S.Sudhakumari MD(Ay), who has been sources of inspiration always.

My deepest regards are due to Dr. P.N.Mohankumar MD(Ay), for his continuous co-operation and constant support given.

I also take this opportunity to thank Smt. P.Jayasree, Librarian, for their constant support.

I offer my special thanks to Yoga instructors Sri. V.P.Kesavan and Guruji Atmaprabothi for the inspiration help and support extended in terms of information on pranayama in the completion of my study.

Thanks are also due to Riju Hari for his in valuable help.

I wish to thank all my patients, who were very co-operative and enthusiastic in voluntarily undergoing the therapy and without whose active participation the present study wouldn't have existed.

Finally the vocabulary is not sufficient to express my deep love and affection towards my respected parents, my wife Sreeja, beloved daughter Anisha and son Athulkrishna.

Dr. M.G.Ramachandran

Contents

List of Tables & Graphs

List of Figures

Introduction

Ardhavabhedaka is a peculiar type of head ache mentioned in *sirorogas* of *Salakyathantram*, which is the branch of Ayurveda deals with the diseases of head, neck, ears, eyes, and oral cavity and their treatment. *Salaka* (probe) in the principal instrument used in this branch, hence the name *Salakya*.

Ardhavabhedaka gains its name from the specific nature of pain. Literally, the word '*ardhavabhedaka*' means tearing or piercing pain on the half of the head. *Acharya Charaka* explains it as either *vathika* or *vatha kaphaja* in origin. Interstingly, *Acharya Vaghbata* conclusively states that

Ardhavabhedaka is a *vathika* disease. The clinical features also support *Vaghbata*'s claims. The presentation will be with various types of pain sensations, which are severe in intensity. The sites of pain are, normally, the temporal region, forehead, eyebrows, eyeballs, ears and sides of neck. Either left or right half of the head will be affected in single episode. The pain establishes the *vathakopa*. The attacks are recurring nature, and the temporal pattern is specific, either once in fifteen days or once in a month. Due to the involvement of *Prana*, the*Indriyas*, especially the *Nayana* (vision) or *Srothra* (hearing), may be damaged if the disease is of severe intensity and chronic in nature.

Siras (head), in *Ayurveda* is explained as *uthmanga* (vital organ). Being the seat of life, intellect and sense organs, it is also one among the three major *marmas*. Though all the three *doshas* can be located in head, predominantly it is the seat of kapha. The *tarpaka kapha* nourishes the *indriyas*; the *prana vayu* controls the functions of *indriyas,manas* and *hridaya*. The perception of vision is brought about by *chakshurvaiseshika pitha* and the *budhirvaiseshika* variety has its vital role in brain function.

The deranged function of *thridoshas* is manifested as neurological, vascular, metabolic and psychological disturbances.

In various *samhitas* of *Ayurveda*, the aetiopathogenisis, clinical features and management of a primary headache (*swathantra sirasoola*)

namely *Ardhavabhedaka* is explained. *Ardhavabhedaka* refers to a hemi cranial headache. Videha elicites the samprapthy of vatha kopha due to obstruction by kapha in one half of the head. Acharya Vaghbata postulates that the involvement of kapha and pitha also should be considered while formulating the treatment of Ardhavabhedaka. Hence it becomes evident, clinically also, that *Ardhavabhedaka* is a *sannipathika sirasoola* with a predominance of *vatha* and *kapha*.

Apart from the common etiological factors of sirasoola there are certain specific causes those trigger (vyanjaka nidana) Ardhavabhedaka. These are consumption of excessively dry or fried food; intake of food before digesting the previous meal, over exposure to wind and fog, over indulges in sex, suppression of urges and physical exertion. These *nidanas* provoke *vatha* and *agnimandya* is essentially followed by *rasadhathu dushti*. That is why patients of *Ardhvabhedaka* exhbits *rasadhathu vikrithi lakshanas* such as vertigo, nausea, photo phobia and fatigue.

The clinical features of Ardhavabhedaka clearly coincide with those of migrain. The nature of severity of pain is described as pricking, piercing and excruciating which is episodic and tend to occur fortnightly or monthly. The sites of pain sensation are the temporal region, forhead, eyes, ears, and neck, vertigo, tinnitus,hearing loss, photophobia and rhinorrhoea are the associated symptoms given by vaghbata. Hearing loss and blindness can occur as complications in severe cases of Ardhavabhedaka.

Treatment of Ardhavabhedaka includes sodhana, samana, and rasayana. Treatment aims at relieving urdhwanga srodhorodha by theekshana sodhana followed by pacifying vatha through samana therapy. This line of management can be successfully practiced in migraine. As condition of adhimantham, vathika karnasoola, vathika prathisyaya etc produce hemicranial head ache, migraine head ache should be differentiated from all other secondary head aches with the parameters of assessment of migraine. In each patient the treatment strategy may vary according to the involvement of *anubandha doshas*.

After attaining *agnideepthy* the patient is subjected to *snehapana* and *virechana*. *Urdhwanga sodhana* is done by *teekshna avapeeda nasya* . This can be followed by *samana/ brimhana nasya, moordha thaila, upanaha sweda,karma poorana, netra tharpana and vasthy* which ever is relavent to the particular case. Severe cases may need *dahakarma* over *lalata* for alleviation of pain.

As *oja kshayakaranidanas* like stress and strain trigger migraine, milk, *mamsarasa*, and drugs of *jeevaneeya gana* are very beneficial in regaining total physical and mental health *Rasayana* nourishes the *sapthadhathus* and reduces the chance of inheritance of this disease into future generations. Patients should also be encouraged to avoid precipitating factors and to follow *pathyakrama* to prevent the recurrence of migraine.

To sum up, *Ayurveda* provides a treatment for migraine that relieves the disease without a recurrence.

Ardhavabhedaka can be compared to Migraine mentioned in modern medicine. Migraine is a common neurovascular disorder characterized by periodic commonly unilateral throbbing head ache. The condition affects about 18% of women and about 6% of men across their life span.

Pathyashadanga is a medicinal compound contains seven drugs inclusive of *pathya,* hence*pathyashadangam.* Thismedicinal yoga mentioned in *Sarngadharasamhitha. Pathyashadanga*isveryeffectivein all*salakya*diseases especially in *Ardhavabhedaka.* This medicinal compound can be used either as decoction or *nasya* or even as oil applied on the head.

Yoga helps to attain a deep relaxation of body and mind leading to the promotion of the positive health which shows that it has an ancient and conceptual linkage to *Ayurveda.* All the yogic practices may be classified as *asanas, pranayamas, bandas and mudras, kriyas,* meditation and attitude training practices.

Pranayama practices bring control over the respiratory impulses which form one of the channels of the flow of autonomic nerve impulses. Holding of the breath for a prolonged and comfortable time is essential.

The word *pranayama* is the union of two words i. e. *'Prana'* and *'Ayama'*. *Prana* means a subtle life force which provides energy to different organs including mind and also many vital life processes. *Ayama* signifies the voluntary effort to control, and direct this *prana*.

Pathyashadanga is a medicinal compound contains seven drugs inclusive of *pathya*, hence *pathyashadangam*. Thismedicinal yoga mentioned in *Sarngadharasamhitha*. *Pathyashadanga*isveryeffectivein all *salakya*diseases especially in *Ardhavabhedaka*. This medicinal compound can be used either as decoction or *nasya* or even as oil applied on the head.

Problem of the study

The problem of the study is to asses the prevention of *Ardhavabhedaka* with the help of *pathyashadanga* and *pranayama*. Included also in the study is comparison of the efficacy of three treatment groups.

Purpose of the study

Purpose of the study is to provide satisfactory new option for prophylactic therapy in *Ardhavabhedaka*, which is affordable to the common man of the society.

Need for the study

Ardhavabhedaka is a common problem in primary health care, it remains an under diagnosed and under treated disorder. This can be

attributed to the low importance given by patient for *ardhavabhedaka*. The most likely reason for this is the lack of specific and effective treatment for *ardhavabhedaka*. Unfortunately patients who do see a doctor do not always feel that they get what they need. *Ardhavabhedaka* patients primarily wants pain relief. Patients are naturally more interested in an explanations about how medication works and possible side effects some thing that the physicians

Failed to mention at all. They long term burden of disease high lights the lack of effective treatment for this disabling condition. The development of new methods of management prevention of attacks of *ardhavabhedaka* continues to be an active area of research in neurology.

Preventive treatment is indicated only for patients who have sufficiently frequent attacks that are not relieved by treatments for acute attacks.

It is there for pertinent in considering the new options for prophylactic therapy to consider the ways in which new agents might reduce the direct and indirect costs attributable to the disease and lead to a reduction in suffering, increased productivity and decreased economic burden.

Deliminations of the study

The study is delimited to

1. 180 patients, who are randomly selected from the special

O.P. for *Ardhavabhedaka* of *Salakya* department, Vaidyaratnam Ayurveda College Hospital, Poochinnippadam.

2. Patients, who are diagnosed as suffering from *Ardhavabhedaka*.

3. Patients are selected in the age group of 10–60 years.

Group A	–	10 – 30 years
Group B	–	30 – 50 years
Group C	–	51 – 60 years

4. Patients without any other known systemic diseases. In this study, the following conditions are not entertained pregnancy, *soothika*, tuberculosis, heart diseases, children below 10 years, geriatrics above 60 years, and sexual transmitted diseases.

5. There is no sex discrimination.

6. The duration of the study period 18 months.

7. The subjects are randomly assigned to three group as Group A (treatment with *pranayama and* placebo), Group B (treatment with *pathyashadangam kashayam and* placebo), Group C (treatment with *pranayama and pathyashadangam*). To assess the effectiveness the possible symptoms are assigned scores according to the gravity of the condition. The scores are considered for the statistical

analysis. In order to test the hypothesis is the statistical tests like chi–square test, paired t–test and student t–test are employed.

Hypothesis

"MANAGEMENT OF *ARDHAVABHEDAKA* WITH *PATHYASHADANGA* AND *PRANAYAMA*"

Hypothetical conclusion of the present study is it is expected that a combination of *pathyashadangam* and *pranayama* would give promising results and prove the superiority of Indian Medicine and Philosophy over the currently utilized Western Medical Practice. *Pathyashadanga* and *pranayama* are more superior and result oriented in the management of *Ardhavabhedaka* than any other mode of treatment. This superiority and efficacy are in tune with treatment practices offered by *Keraleeya Vaidyas*.

Part – I
Review of Literature

- Ardhavabhedaka Ayurveda Perspective
- Ardhavabhedaka Modern Perspective
- Siras
- Sirasoola (Pain)
- Para nasal sinuses
- Marma in head and neck
- Nasya karma
- Pranayama

1. ARDHAVABHEDAKA
ayurveda perspective

1.1. Nirukthi

"Ardhe tu moordhah so ardhavabhedaka"

As it appears in half of the head it is called *Ardhavabhedaka.*

Ardhavabhedaka is the most excruciating disease among the diseases of head causing headache. *Ardhavabhedaka* is experienced by women more than men in the ratio 3: 2 and the mean age of onset is 19 years. The initial attack of this disease is mostly in the first decade of life in almost 20% of cases. Almost 60% of these cases have a family

history. Though there are not many variations in the personality of *ardhavabedaka* patients, it is mostly seen among the persons who are more anxious, intelligent ambitious and tidy ones ie, *pittakaphaja prakriti*. Its significance is that it affects only one part of the head or only half of head.

1.2. Aetiological factors

While the etiological factors of Shirorogas are considered, *Charaka* describes these in detail for each specific *siroroga* where as a detail description is not seen in *Susrutha samhitha*. *Vaghbata* mentions the causative factors of *siroroga* in general.

Suppression of natural urges, day sleeping, night awakening, intoxication, speaking aloud, exposure to frost and easterly wind, excessive sexual indulgence, inhalation of undesirable smell, exposure to dust, smoke, snowfall and sun, intake of heavy sour food and rhizomes including tubers etc. in excessive quantity, excessive drinking of cold water, injury to head, vitiation of *ama*, lamentation, suppression of tears, cloudy atmosphere, anxiety and adaptation of regimen contrary to those prescribed for the locality and season; predisposes to vitiation of *dosas* like *vata*, which get aggravated resulting in the vitiation of *raktadhatu* in the head. This causes diseases with various symptoms in head (Ch.Su.17/8–11), one of which is our current day study problem, *ardhavabhedaka*.

The etiological factors relating to *aahara* and *vihaara* of *sirasoola* is narrated in *Charaka samhitha, Ashtangasamgraha, Ashtangahridaya* and *Madhavanidana.*

1.2.1. Dosha Hethu

Charaka have called this disease as a *vataja* or *vatha kaphaja* disease. *Vaghbhata* have classified this disease as a type of *vataja sirasoola.* In this disease, *vatadosha is obstructed by kapha dosha* producing pain in half the region of the cranium. Some of the writers considers this disease as a *vata pittaja condition.* The disease is described among *sannipathaja* diseases, so some other writers project it as *tridoshaja* disease.

But the study of etiology and symptoms of this disease proves this to be a *vataja* or *vata–kaphaja* disease. But due to *vyadhiswabhava* (nature of disease) it speedily progress into *sannipatika* disease, so the above diversities of opinion about the pathogenesis and doshaswabhava of this disease are to be considered on the merit of individual cases alone and hence is to be approached likewise. Texts are on the concerted opinion that *prakupit vayu* is obstructed by the *kapha* so this *vata dosha* dries the *kapha.* For the process of drying up, *Ooshma* is necessary which is maintained by *pitha dosha. Prakupitha vatha* present in the cervical; supra orbital and temporal and frontal regions produces penetrating pain in the head. In this way the combination of *pitta dosha* is necessary in the dryness of *kapha,* and this should be the probable explanation of *Susrutha*'s

classification of this disease as *tridoshatmaka*.

Susrutha	Tridosha
Charaka	Vata, Vata kapha
Vaghbhata	Vata

1.2.2. Aahara hethu

Pungent and non–nutritious food, stomach full diet, alcoholism, *langanam*.

1.2.3. Vihaarahethu

Purovayu (Eastern wind), excessive coitus, holding *wegas*, film seeing, exercise, mental stress. etc.

1.2.4. Parambarya Hethu

Heriditory +++

Ardhavabedaka occurs due to the affection of vitiated *vata* on blood vessels cause constriction of blood vessels of *masthishkavaranakala* (meninges), *Kapala* (extra cranial) or *Masthulunga* (brain) . Initially the blood vessels will be constricted followed by their dilatation causing vasodilatation. Sleeping late and mental stress can also evoke this type of headache. *Shirobhighata* (head injury) can also provoke the same. Fatty foods, chocolates and oranges, tomatoes, onions, pineapples are also said

to precitate this head ache. Hormonal changes occurring during menstruation can also cause this.

The *prakupitha vayu* due to the aetiological factors indepently or due to *kapha bandha* becomes more powerful and resides in the region of the cranium producing *ardhavabhedaka*.

Rooksha aharam
+
Stomach full diet
↓
Vata
+
Kapha
↓
Vatarodha
↓
Pain in the temporal region
↓
Half region of the cranium
↓
Ardhavabhedaka

1.2.5. Specific aetiological factors

In take of rough *(rooksha)* food, over eating during indigestion, exposure to easterly wind and dews, excessive coitus, suppression of urges exertion and physical exercise.

1.2.6. Symptomatology

Severe pain like cutting and churning in half of carotid region, eyebrow, temple, ear, eye, forehead (Ch.Si.9/75–76). A violent and excruciating pain or aching nature felt in one half of the cranium making the patient feel giddy (Su.Ut25/12). Severe pricking pain in temples, feeling of severe pain as though the *ghata* (area above the temples) gets open, the center of he brows and forehead fall out, ears are painful and have

noise in them, eye feel as though being plucked out, the head feels loose in all its joints, there is severe pulsation in the net work of veins (blood vessels), rigidity of the lower jaw and the shoulders, intolerance to light, running nose, relief of pain with out any reason occasionally and reduction in its severity by massaging anointing with oil and fomentation. All these symptoms appear in half of the head in *Ardhavabhedaka*. (A.H.Ut.23/4–7b).

Symptoms of Ardhavabhedaka

Symptoms	CS	SS	AS	AH	MN
Severe pain in the cervical region	+	+	+	–	–
Severe pain in supra orbital region	+	+	–	–	+
Severe pain in the temporal region	+	+	–	–	+
Ear ache	+	+	–	–	+
Pain of the eyes	+	+	–	–	+
Severe pain in the half of the frontal region	+	+	–	–	+
Pain in the temporal region	+	–	–	–	+
Manyathovata pida	–	–	–	–	+
Burning pain	+	–	–	–	+
Netrendriya nasa	+	–	+	+	+
Karnendriya nasa	+	–	+	+	+
Penetrating pain the half region of the cranium	–	+	–	+	–
Brama	–	+	–	–	–
Pakshata akramanam	–	+	–	–	–
Swayam pida shamanam	–	–	–	–	–

1.2.7. Samprapthi

Vata vitiated due to the aetiological factors mentioned previously singly or accompanied by *Kapha* seizes the of the head and then produces the symptoms of *Ardhavabhedaka* (Ch.Si.9/74–75) .

Contents of samprapthi

Place of origin	***Masthishka***
Region of spreading	Half region of the cranium
Adisthanam	*Ardhamasthishkam*
Vyakthi	*Ardhamasthishkam*
Dosha	*Vatha (kapaja)*
Dushya	*Majja*
Srothasa	*Majjavaha srothas*
Types of *Dushti* (infection)	*Sanga* (obstruction)

1.2.8. Involvement of doshas in Ardhavabhedaka

Vagbhata states *Ardhavabhedaka* as a division of *vataja sirasoola* claiming that only vata is involved.According to *Charaka vata* alone or *vatha* and *kapha* may be involved. According to *Sushrutha* it is *tridoshajanya. Vatha pitha kapha,* three *doshas* are involved.

1.2.9. Course and Prognosis

It occurs either by a fortnight or a month and subsides of its own

accord. When greatly aggravated it destroys either the eye (sight) or ears (hearing) (A.H.Ut.23/8). According to *Susrutha* this disease either follows no distinct periodicity or recurs at regular intervals of ten days or of a fortnight (Su.Ut.25/12)

1.2.10. Differential diagnosis

Ardhavabhedaka by term itself means that it is unilateral pain felt in head region.The differentiation from the *vataja sirasoola* is done by its pattern of distribution. In *vataja sirasoola* the symptoms mentioned in *Ardhavabhedaka* occur bilaterally.

In *pittaja sirasoola* there is a feeling of hot fumes coming out from the head, fever, profuse sweating, burning sensation in the eyes, fainting, pain becomes less at night and by cold things.

In *kaphaja sirasoola* there is loss of taste, feeling of heaviness of the head, rigid and cold veins, non pulsating, lassitude, mild pain during day severe pain at nights, stuper, sweating of eye sockets, itching inside the ears and vomiting.

In *suryavartha, vata* followed by *pitta* produces severe throbbing pain in temples, eyebrows and forehead commencing with the rise of the sun, increase in severity in he midday and on being hungry of uncertain comfort to hot or cold and subsides later (after the sun sets).

1.3. Line of treatment

Chathursnehas in the maximum dose, evacuation, purgation, tubular fomentation, old ghee, unctuous enema, upanaha, cranial pouch and cauterization are recommented (Ch.Si.9/77–78).

The head should be anointed and ghee should be consumed at night followed by drinking warm water. *Masha, kulatha,* or *mudga* may be consumed with milk. Application of poultice or fomentation with balls of meat and corns (well cooked) are beneficial. Pouring warm milk boiled with *dasamul* and other drugs mitigating *vata* should be done.

In *ardhavabhedaka,* the same treatment together with those relevant to the increased *dosha* is to be done.

1.3.1. Pathyapathya

Pathyam

1. ***Kriyakarma*** *: Swedana, nasya, dhoomapana, vamana, virechana, sirolepa, langana, seka, sirovasthi, raktamokshana, agnikarma, upanaha.*
2. ***Ahara*** (Diet) : *Puranaghritham, shali, shashtikadhanyam, yusha* (soup), *dugdha* (milk), *jangalamamsa, sanyyab, madhumastha, thilathaila,* coconut water, *kanjika, thakra.masham, kulatham, mudgam.*

3. ***Vegetables*** *: Sigru, patolam, vastuka, karavellaka.*

4. ***Fruits*** *: Amraphalam, amalaki, dadima, mathulunga, jambeera, draksha,* coconut.

5. ***Medicines*** *: Hareethaki, amalaki, bhoonimba, nimba, amritha, nisa, kushta, bringaraja, kumari, mustha, useera, karpoora, gandhasara.*

"Swedho nasyam dhoomapanam vireko
lepa chardi langanam seershavasthi:|
Rakthomukthirvahinkarmopanaho jeernam sarpi:
salaya: shashtikacha||
Yusho dugdham dhanwamamsam padolam
sigru draksha vasthukam karavellakam|
Amra dhatri dadimam mathulungam
thailam thakram kanjikam narikelam||
Pathya kushtam bringarajam kumari
musthoseeram chandrika gandhasara:|
Karpoorajava ranyathimanena varga:
sevyo marthye: seersharoge yadhaswam||"

(Baishajyaraknavali)

"Kshavajrimgamootrabashpanidra vit vegamajjanam|
Dhushtam neeram virudhannam sahyavindhya sarijanam.||
Danthakashta dhivanidra sirorogae parithyajel |"

(Baishajyaraknavali)

Ardhavabhedaka mention in *Ayuevdic* classics can be compared

to the migraine. The salient features of *Ardhavabhedaka*, which are in resemblance to Migraine, are

Apathyam

1. ***Vegadharanam*** : Sneezing, yawning, micturition, sleep, lacrimation, stool excretion.
2. ***Aharam*** (Diet) : Consuming cooked and uncooked food, impure water, curd, lassie, cool drinks, water of rivers of *Sahya, Vindhyas, Kadal, kapha* producing diet.
3. ***Viharam*** : *Diwaswapana, ratrijagaranam, danthadhavanam, etc.*

1.3.2. Prevention of *Ardhavabhedaka*

1. Natural urges are not to be suppressed
2. Day sleep is to be avoided
3. Night awakenings is also contra indicated
4. Exposure to sun, smoke snow, dew, should be restricted
5. The food which is excessive rough (athirooksha) is to be avoided
6. Eating only when the food taken previously is digested
7. Regular following of dhinacharya, rithucharya and other regimens.
8. Following the general code of ethics.

2. ARDHAVABHEDAKA
modern perspective

Migraine is one of the most common complaints encountered by primary care physicians and neurologists. It is a condition that causes disability, be it often temporary, and strains the personal and professional development. Mankind, through writings since the dawn of recorded history, knows this painful condition. If it was a scourge or an encouragement to Caesar, Paul, Kant and Freud, it is also a daily fact of life to anonymous millions who suffer in secrecy and silence.

In the first century of Christian era Aretaeus of Cappadocia

described it as heterocrania. The French word Migraine is said to be derived from "megrim" which in turn was derived from the Latin word "hemi crania".

Migraine is an episodic headache separated by headache -free intervals with any two of unilateral distribution, aura symptoms, nausea and family history of similar headaches (Vahlquist1955)

Migraine is an episodic headache with or without cerebral disturbance with intervening periods of relative freedom from headache and without evidence of any primary structural abnormalities. (W. Lance) Migraine is a paroxysmal disorder with relative freedom from symptoms between attacks. The attacks consist of transient focal neurological symptoms and/or headache. The transient focal neurological symptoms are almost always sensory is nature, generally visual and some times somato-sensory. However, the headache is usually so intense that interferes with the ability to function and is associated with other symptoms such as light and noise sensitivity, nausea and vomiting. These symptoms usually follow the onset of the headache and increase in intensity as the headache progresses. The transient focal neurological symptoms on the other hand, almost always precede the onset of the headache or occur during its initial phase. These symptoms are often referred to as aura symptoms.

The attacks of migraine generally last less than one hour when

they merely consist of transient focal neurological symptoms but last from hours to days when headache is present. When the transient focal neurological symptoms occur without headache, the condition is referred to as isolated migraine aura or migraine aura without headache.

When both the transient focal neurological symptoms and headache occur, the condition is referred to as classic migraine or migraine with aura. When the headache occurs by itself, the condition is referred to as common migraine or migraine without aura. According to the International headache society the simplified diagnostic criteria for migraine with and without aura are:-

2.1. Migraine without Aura

- Attacks lasting 4 to 72 hours
- At least two of the following for headache characteristics
  - Unilateral
  - Pulsating
  - Moderate to severe
  - Aggravated by movement
- At least one associated symptom:
  - Nausea or vomiting
  - Photophobia
  - Phonophobia

To fulfill criteria of IHS, patient must have had at least five such attacks and have no other medical problem. Duration applies to untreated or unsuccessfully treated attacks with moderate to severe intensity, in the sense disturbing or precluding daily activities.

2.2. Migraine with aura

One or more transient focal neurological aura symptoms Gradual development of aura symptoms over>4min, or several symptoms in succession

- Aura symptoms last 4-60 minutes
- Headache follows or accompanies aura with 60 minutes.

2.3. Epidemiology

Migraine is a very common disorder across the life span, with highest prevalence during the peak productive years between the ages of 25 and 55 years. Prevalence is greater in females than in males after the age of 12 yrs but the sex ratio varies with the age. The female to male

ratio is 3:2. Migraine is inversely associated with income perhaps because loss of jobs or inability to study due to frequent attacks.

Prevalence of migraine in general population is estimated as 6% in men and 15% -18% in women.

The incidence of migraine was lower in males than in females and occurred at an earlier age. The incidence of migraine with aura in males was 6. 6 per 1000 person -years and peaked at 5 to 6 years of age. The peak incidence of migraine without aura in males was 10 per 1000 person -years and peaked between the ages of 10 and 11 years.

For females, the incidence of migraine with aura was 14. 1 per 1000 person - years, with a peak at ages 12 to 13 years. The incidence of migraine without aura was 18. 9 per 1000 person- years and peaked at the ages 14 to 17 years.

2.4. Synonyms

Hemicrania, bilious attack, sick headache.

2.5. Aetiology

The aetiology of migraine is complex. Although the pathophysiology of parts of migraine attack, notably the aura and the headache phases seem to be at least partly understood, the true cause of migraine, that is why and how a migraine attack begins is not known.

Every one may suffer from one or two migraine attacks in life indicating that the migraine attack in itself is not an abnormal feature. The tendency to get the recurrent attacks (i.e. existence of a lower threshold for specific or non specific internal and external migraine trigger factors) is abnormal. Patients suffering from recurrent attacks are considered to suffer from the disease migraine.

2.6. Age and Sex

The age of onset is usually at or shortly after puberty, much less frequently in middle life or later, though an onset at about the menopause is not uncommon in women. The highest prevalence is seen between the ages of 25 and 55 years. Prevalence is greater in females than in males after the age of 12 years but the ratio varies with age.

2.7. Hereditary

Migraine is often inherited as a Mendelian dominant trait. Many migraine sufferers have affected relatives. It is very likely as yet unproven that hereditary factors are important in the individual susceptible to migraine attacks. The association of migraine with a large number of hereditary diseases open the possibility to choose candidate chromosomes for linkage studies.

Familial hemiplegic migraine is linked to chromosome 19 p and to at least one other locus. Hereditary paroxysmal cerebellar ataxia is linked to the same region on chromosome 19, which suggests a possible

role of an ion channel gene in familial hemiplegic migraine and should be investigated further. The familial hemiplegic migraine chromosome 19p locus also seems to be involve in normal migraine.

2.8. Intracranial Disturbance of Function

Migraine is due to arterial spasm, followed by dilatation, occurring with in the distribution of the common carotid artery. During the scotomatous phase of an attack, focal electro encephalographic changes have been observed in the opposite cerebral cortex, consistent with cortical ischaemia (Engel.et.al.1945) and during this phase it has also been observed that amyl nitrite will temporarily abolish the scotoma (Schumacher and Wolff, 1941).

There is a generalized, rather than focal, reduction in blood flow during the aura. Occlusion of the retinal arteries has been observed during an attack, (Graveson 1949, Brien 1971) and has a persistent visual field defect due to ischaemic pappillopathy (Mc Donald and Sanders, 1971). The arterial spasm in the retina and or the visual cortex is responsible for the subjective visual disturbances and other cortical symptoms at the onset of the attack, while subsequent vasodilatation causes the headache and is manifest in flushing of the face, congestion of the superficial temporal artery and of the conjunctiva and the nasal mucosa on the side of the headache.

2.9. Ocular Factors

Refractive errors and defective ocular muscle balance are often blamed for migraine, though probably usually with little justification. Attacks may certainly be precipitated, however, by unusual visual stimuli, such as bright light.

2.10. Allergy

The importance of allergy was stressed by Balyeat (1933). Sufferers from migraine may often be shown to be sensitive to one or more food proteins or other allergens, including pollen and tobacco, and may suffer from other disorders of an allergic nature.

2.11. Dietetic Factors

Excessive consumption of animal fat or alcohol may be followed by an attack. So, too, may miss a meal (Hockaday et al 1971).

2.12. Psychological Factors

Major sector of the sufferers from migraine, are the most intelligent and industrious members of the community. Attacks of migraine may be precipitated by mental fatigue anxiety, or by other forms of stress. However, Waters (1971) found no evidence that individuals with migraine were more intelligent or higher social class. Many women suffering frequent attacks at about the time of the menopause are found to be depressed and treatment of the depression is then beneficial. The personality features

most commonly seen consist of characteristics of inflexibility and shyness in childhood giving rise to adult perfectionism, rigidity, resentment, ambitiousness and efficiency in short a constitutional predisposition to sustained emotional states. Persistence towards successes, difficulty in sexual adjustment, perfectionism, conventionality, intolerance and in general obsessive-compulsive features are associated with migraine to a greater degree than would be accounted for by chance.

2.13. Endocrine and Metabolic Factors

On the whole there is little evidence that endocrine abnormality is important. The occurrence of menstrual migraine has been quoted in favour of an ovarian disturbance. Water-retention occurs in some cases, Goldziecher (1941) Sicuten etal (1961) showed that the urinary excretion of 5-hydroxyindolacetic acid may be increased in severe attacks suggesting an intermittent release of 5-hydroxytryptamine (Serotonin) into the circulation (curzon et.al.1966). An evidence was also found to suggest that the catabolism of serotonin and nor epinephrine is increased in the plasma during migraine headache. Adams et.al. (1968) biopsied temporal arteries during attack and found that the tunica adventitia of the arteries in such patients has a marked capacity to bind noradrenaline.

2.14. Association with Epiliepsy

Some writers on the association of migraine with epilepsy have

laid much stress. Both are common disorders. Many have thought that the relationship is coincidental. Occasionally a severe attack of migraine may terminate in an epileptic attack. But loss of consciousness at the height of an attack is more often sync opal (Bickerstaff, 1961).

2.15. Association with Hypertension

The onset of arterial hypertension in middle adult life may be associated with late onset migraine, especially when the hypertension is paroxysmal.

2.16. Head Injury

Migraine may appear for the first time following head injury and head trauma may trigger an attack.

2.17. Intra Cranial Lesions

Very rarely typical migrainous symptoms appear in association with cerebral arterio venous malformations aneurysms and tumours. Such associations may be no more than coincidence; but suspicion of an underlying lesion should be raised when symptoms always recur on the same side.

2.18. Trigger factors

Trigger factors are events that bring on a migraine attack. Trigger factors are both exogenous and endogenous in nature. About 20 % of patients relate their attacks to eating specific foods or drinks when the

migraine usually follows some hours later. The most potent endogenous trigger factor is the oestrogen cycle in women, which largely accounts for the two or three times higher prevalence of migraine in women, than in men. Other endogenous trigger factors are fatigue, lack of sleep, oversleeping and missing meals. Attacks are more common at weekends and holidays.

An important exogenous trigger factor of migraine is stress. Emotional stress is a common precipitant. Other exogenous trigger factors are weather changes, alcoholic beverages and dietary products.

The weather changes include exposure to sun, rapid changes in barometric pressure. Strong stimuli such as bright and flickering lights, vivid visual patterns, loud noise, strong smells. The dietary products precipitating the migraine attack include chocolate, cheese, citrus, fruits, caffine, icecream, eggs, liver, onions, bananas, tomatoes, fatty food, food additices such a sodium nitrite, mono sodium glutamate. Foods, which are commonly implicated, contain tyramine and phenyl ethylamine. The alcoholic beverages include the red wine, white wine, beer etc.

2.19. Classification

In the headache classification as proposed in 1962 by the National institute of Neurological Diseases and Blindness (NINDB), migraine is classified under the category of vascular headaches of the migraine type.

This category includes;

1. Classic migraine
2. Common migraine
3. Cluster headache
4. Hemiplegic migraine
5. Ophthalmoplegic migraine
6. Lower half headache (facial migraine)

These headache conditions are thought to have in common, as an important pain mechanism, extra cranial arterial vasodilation. In the headache classification as proposed by the international headache society in 1988, migraine represents a separate category, in this category; seven forms of migraine are distinguished as shown in the table. The two major forms of migraine in this classification, migraine without aura and migraine with aura correspond to common and classic migraine of the NINDB classification.

2.20. IHS Classification of Primary Headache

Migraine

- Migraine without aura
- Migraine with aura
  - Migraine with typical aura
  - Migraine with prolonged aura

- Familial hemiplegic migraine
- Basilar migraine
- Migraine aura without headache
- Migraine with acute onset aura

- Ophthalmoplegic migraine
- Retinal migraine
- Childhood periodic syndromes that may be precursors to or associated with migraine
  - Benign paroxysmal vertigo of childhood
  - Alternating hemiplegia of childhood
- Complications of migraine
  - Status migrainosus
  - Migrainous infarction
- Migrainous disorder not fulfilling the above criteria.

Classification of migraine according to international classification of diseases

Migraine

- Migraine without aura (common migraine)
- Migraine with aura (classical migraine)
  - With typical aura
  - With prolonged aura
  - With acute onset aura
- Hemianopic and other visual migraine
- Hemisensory migraine

- Migraine with aphasia
- Basilar migraine
- Migraine aura (all types) without headache.
- Familial hemiplegic migraine
- Multiple types of aura
- Other specified migraine with aura
  - Status migrainosus
  - Complicated migraine

    Migrainous cerebral infarction
  - Other migraine
  - Ophthalmoplegic migraine
  - Retinal (monocular) migraine
  - Childhood periodic migrainous syndromes
  - Abdominal migraine
  - Benign paroxysmal vertigo of childhood
  - Alternating hemiplegia of childhood
  - A typical migraine
  - Migraine, unspecified.

2.21. Diagnostic Criteria

Diagnosing the cause of headache in general practice is a daunting task given the my riad of clinical problems that are seen daily. To treat migraine adequately, it is necessary to make the correct diagnosis. The

lack of classification system and diagnostic tests have hampered doctors for many years.

There are however some guiding principles, that allows safe, accurate and rapid diagnosis of headache problems. The IHS classification system for headache published in 1988 listed operational diagnostic criteria for migraine.

With regard to the diagnosis of migraine without aura, the IHS classification requires at least five attacks which fulfill the following criteria:

1. The headaches last from between 4 and 72 hours (though in children below the age of 15, they may last for as little as 2 hours).
2. The headaches have at least two of the following four features: unilat eral location, pulsating quality, moderate or severe intensity, and ag gravation by walking stairs or similar routine physical activity. The intensity of headaches is rated as moderate when they inhibit and severe when they prohibit daily activities.
3. The headaches are associated with nausea or vomiting or with photophobia and phonophobia (i.e. light and noise sensitivity). The diagnosis of migraine with aura is based on the aura symptoms and not on the headache (i.e. the features of the headache are irrelevant).

The I H S classifiction requires at least two attacks, which fulfill three of the following four criteria:

1. There are one or more fully reversible aura symptoms, indicating focal cerebrocortical or brain - stem dysfunction.
2. At least one of the aura symptoms develop gradually over more than four minutes, or two or more symptoms occur in succession.
3. None of the aura symptoms lat longer than 60 minutes but if more than one aura symptom is present, the accepted duration is proportionally increased.
4. The headache follows the aura symptoms with a symptom - free interval of less than 60 minutes but may also begin before or simultaneously with the aura.

In general practice, the various subgroups of migraine with aura are probably of little significance. An exception is the subgroup migraine aura without headache in which the aura symptoms are not followed by headache. This is a relatively common condition, which in the older patient needs to be differentiated from transient ischemic attacks.

In migraine with prolonged aura one or more of the aura symptoms last longer than 60 minutes but shorter than one week and neuroimaging is normal.

If neuroimaging is abnormal (i.e. shows ischemic infarction) or one or more of the aura symptoms lasts longer than one week, migrainous infarction is diagnosed.

Migrainous infarction is a sub group of complications of migraine and can occur in migraine without aura as well. It is also referred to as complicated migraine or migraine complicated by stroke.

In migraine with acute onset aura the aura symptoms develop fully within four minutes. However, inaccurate history is given as the most common reason for the acute onset of the aura symptoms.

Familial hemiplegic migraine is a rare (childhood) condition of headaches associated with hemiparesis, in which at least one first degree relative is also affected.

Basilar migraine is likewise a rare condition that mostly affects young adults. In this condition, the aura symptom (e.g. double vision, bilateral paresthesias, or decreased level of arousal) originates from the brain stem or from both occipital lobes. The condition must be differentiated from migraine associated with anxiety and hyperventilation, or with vasovagal lability.

Retinal migraine is a form of migraine with aura, although it is classified as a separate condition. The aura symptoms are visual in nature

but are monocular rather than homonymous. They also are fully reversible, last less than 60 minutes, and are followed by headache with a symptom free - interval of less than 60 minutes.

In ophthalmic migrain the headaches are associated with paresis of one or more of the cranial ocular nerves (i.e. the oculomotor, trochlear, or abducens nerves). In the majority of cases, the oculomotor nerve is involved and often only the parasympathetic nerve fibers, resulting in a dilated pupil that is unresponsive to light.

Status migrainosus or migraine status is one of the two complications of migraine, the other being migrainous infarction. Status migrainosus is the term used for migraine headaches lasting longer than 72 hours, although a headache - free interval of less than four hours between consecutive headaches may occur. As with migrainous infarction, status migrainosus can occur in migraine without aura as well as in migraine with aura.

2.22. Differential Diagnosis

To, simplify the differential diagnosis of migraine, headaches can be divided into either chronic or sub-acute, and then subdivided into either episodic or constant. They are then divided into localised or generalised headaches.

Chronic Episodic headaches

- ***Chronic episodic headache, unilateral anterior or hemicranial site***

Most commonly : Migraine or cluster headache may represent episodic tension-type headache, post traumatic headache, temporal arteritis or cervicogenic headache.

- ***Chronic episodic headache, unilateral posterior site***

Most commonly: Migraine, chronic cluster, occipital neuralgia (if unilateral with sensory numbness) or headache originating from the neck.

Less likely : hypothalamic or cavernous sinus lesion such as temportal arteritis (occipital artery involvement) or posterior fossa/skull base lesion.

- ***Chronic episodic headache, generalised***

Most commonly: migraine or episodic tension-type headache.

Less likely : hypnic headache or an organic headache

Eg. Caused by temporal arteritis sphenoid sinusitis or a mitochondrial disease.

Chronic constant headache

- ***Chronic constant headache unilateral anterior location***

Probably : Chronic cluster, or its variant (hemicrania continua), or tension type headache.

Less likely : Migrane is far less likely. Organic causes include temporomandibular joint dysfunction, temporal arteritis, supra orbital nerve entrapment, localised skull metastasis or benign tumour of the skull or soft tissue.

- ***Chronic constant headache, generalised***

Most likely : chronic tension type headache

Less likely : idiopathic intracranial hypertension or analgesic rebound headache

Many patients with fibromyalgia and chronic fatigue syndrome have headache as a clinical manifestation.

Other possible organic causes : paget's disease, skull metastasis, central nervous system infection and metabolic (CO_2 narcosis, $PaCo_2$ > 50mm Hg. with our hypoxia) toxic (chronic CO poisoning) or endocrine (hypothyroidism, prolactinoma) disorders.

Subacute Headache (1 to 6 weeks)

- ***Subacute constant headache in unilateral location***

Primary disorders : status migrainosus, cluster headache or cluster variant (hemicrania continua).

Possible organic causes are : temporal arteritis painful ophthalmoplegia, subdural haematoma orlateral venous sinus thrombosis (from sinusitis, oral contraceptives hypercoagulable state, haematological or rheumatological disorders).

- ***Subacute intermittent, unilateral headache without side shifting***

Most commonly : episodic cluster migraine or tension type headache.

Less likely : Post-traumatic headache, trigeminal neuralgia, glossopharyngeal or occipital neuralgia, cervicogenic headache, tolosa-hunt syndrome or temporal arteritis.

- ***Subacute constant, generalized headache***

Most likely : tension type headache or status migrainosus.

Less likely : CNS infection (viral, tuberculous, parasite infection, brain abcess) CNS vasculitis (isolated or related with connective tissue disorders). Systemic infection (toxic - vascular headache after viral infection) low cerebrospinal fluid pressure headache, metabolic, toxic or endocrine disorders or subarachnoid haemorrhage.

- ***Sub acute posterior headache***

Benign causes : include occipital neuralgia and cervicogenic headache.

Organic causes : include uncontrolled severe hypertension, posterior fossa stroke, brain tumour, vertebrobasilar dissection or bony C-spine or skull base lesions including osteomyelitis, paget's disease

of bone with platybasia (flattening and invasinatioin of skull bases) multiple myeloma and atlanto-axial sub luxation from rheumatoid arthritis.

Other Primary Headache Disorders : The criteria for tension type headache were devised to distinguish the qualities of this headache from migraine.

I H S criteria for various forms of tension type headache

- ***Tension type headache***

  At least two of the following Pain characteristics

  1. Pressing/tightening (non pulsating) quality
  2. Mild or moderate intensity (may inhibit but does not prohibit activities)
  3. Bilateral location
  4. No aggravation by walking stairs or similar routine physical activity.

  Both of the following;

  1. No nausea or vomiting (anorexia may occur)
  2. Photophobia and Phonophobia are absent, or one but not the other is present.

  At least one of the following;

  1. History and physical and neurologic examinations do not suggest one of the disorders listed in groups 5-11 (headaches secondary to organic or systemic metabolic disease).

2. History and/or physical and /or neurologic examinations do suggest such disorder, but it is ruled out by appropriate investigations.
3. Such disorder is present, but tension type headache does not occur for the first time in close temporal relation to the disorder.

- ***Episodic tension-type headache***

  Diagnostic criteria:

  a. At least 10 previous headache episodes. Number of days with such headache< 180/year (<15/month).
  b. Headache lasting from 30 min to 7 days.

- **Chronic tension type headache**

  Diagnostic criteria

  a. Average headache frequency> 15 days/months (>180d/y) for >6 months.

- **Tension-type headache associated with disorder of pericranical muscles**

  At least one of the following :

  1. Increased tenderness of pericranial muscles demonstrated by manual palpation or pressure algometer.
  2. Increased electromyographic level of pericranial muscles at rest or during physiologic tests.

- **Tension - type headache unassociated with disorder of pericranial muscles:**

No increased tenderness of pericranial muscles. In this study, electromyography of pericranial muscles shows normal levels of activity.

IHS Diagnostic criterial for cluster Headache

A. At least five attacks fulfilling B-D.

B. Severe unilateral orbital, supraorbital, and /or temporal pain lasting 15 to 180 min untreated.

C. Headache is associated with at least one of the following signs, which have to be present on the pain side.

1. Conjunctival injection
2. Lacrimation
3. Nasal congestion
4. Rhinorrhea
5. Forehead and facial sweating
6. Miosis
7. Ptosis
8. Eyelid edema

D Frequency of attacks: from one every other day to eight per day.

E At least one of the following :

1 History and physical and neurologic examinations do not suggest one of the disorders listed in groups 5-11 (headaches secondary to organic or systemic metabolic disease).

2 History and physical or neurologic examinations do suggest such disorder, but it is ruled out by appropriate investigations.

3 Such disorder is present, but migraine attacks do not occur for the first time in close temporal relation to the disorder.

- Cluster headache, periodicity undetermined.
- Episodic cluster headache

Description : Occurs in periods lasting 7 days to 1 year separated by pain-free periods lasting >14 days.

- Chronic cluster headache

Description : Attacks occur for more than 1 year without remission or with remissions lasting < 14 days.

2.23. Symptomatology

The symptoms of migraine are limited mostly to the migraine attack: Between the attacks, usually patients are relatively symptom-free. The central symptom of the migraine attack is headache, though it is sometimes absent (as in migraine aura without headache). The headache of migraine is usually so intense as to be associated with at least some degree of disability. Typically it is limited to one side of the head, but this is certainly not always the case. When limited to one side, the headache alternates sides, though it may exhibit a preference for one side or the other. Within the head, the headache of migraine is often located in the

temple and sometimes also in or behind the eye. Other preferential locations are in the forehead and in the back of the head, often just behind the ear. The headache is either throbbing or sharp- steady in nature, especially in the temple. It is aggravated by such physical activity as going up a flight of stairs, bending over, coughing, sneezing or straining. The headache is generally alleviated somewhat by lying down and by applying pressure or a cold pack to the temple, eye or forehead.

The migraine headache almost always occurs associated with other symptoms. These symptoms generally occur after the onset of the headache and build up in intensity as the headache progresses.

The associated symptoms of the migraine headache can be divided into two groups : *autonomic symptoms* and *sensory symptoms*.

The Autonomic symptoms consist of

1. Pallor of the face
2. Coldness of the hands and feet
3. Lack of appetite
4. Nausea
5. Vomiting
6. Diarrhoea

They are probably caused by excessive activation of the sympathetic nervous system, secondary to the pain.

The sensory symptoms consist of:

1. Increased sensitivity to light (Photophobia)
2. Increased sensitivity to noise (phonophobia)
3. Increased sensitivity to smell (Odorophobia)

The increased sensitivity sometimes reaches a degree at which exposure to light or noise actually increases the intensity of pain. Similarly, increased sensitivity to smell can reach an extent at which exposure to an odor, even when pleasant (e.g. perfume), aggravates the intensity of the nausea and causes vomiting. The cause of the sensory symptoms is not known, but they are probably also secondary to the headache. They may be due to the increased arousal caused by the pain through stimulation of the reticular activating system. However, in the increased sensitivity to the light (photophobia), a peripheral mechanism also may be involved-possibly the relaxation of the muscles of accommodation through activation of the rudimentary sympathetic innervations of these muscles. Such a peripheral mechanism also may explain the blurring of vision especially of near vision, as is regularly observed during migraine headaches. This blurring of vision often is not recognized as an associated symptom of migraine and is sometimes taken for a migraine aura symptom.

In so-called Classic migraine or migraine with aura, the migraine headache is preceded by transient focal neurological symptoms. These symptoms are generally referred to as aura symptoms and are almost always sensory in nature. They occur before the onset of the headache or during

the initial phase of headache development. They are relatively short in duration and generally last from 10 to 30 minutes.

The aura symptoms of migraine are most often visual in nature but also can be somatosensory. The typical presentation of the visual aura of the migraine is the scintillating scotoma also referred to as fortification spectra or teichopsia. It usually begins near the center of vision as a twinkling star that develops into a circle of bright, sometimes colourful, flickering zigzag lines. The inside of the circle subsequently opens up and develops into a semicircle or horseshoe; which further expands into the periphery of one visual field. On the inside of the semicircle or horseshoe, a band of dimness follows in the wake of the cresent of flickering zigzag lines. The visual disturbance ultimately fades away in the periphery of the visual field in which it developed.

The typical presentation of the somatosensory disturbance of migraine is the digitolingual syndrome. It consists of a feeling of numbers or tingling that starts in the fingers of one hand.

Subsequently, the numbness gradually extends upward into the arm and, at a certain point, also involves the nose-mouth are on the same side. The progression of the numbness, like that of the scintillating scotoma, is slow and usually takes from 10 to 30 minutes. The digitolingual syndrome is always unilateral and must be differentiated from the bilateral paresthesias of hyperventilation syndrome.

Sometimes the numbness is so intense that the involved extremity is perceived as being weak, but examination will disprove this. If real muscle weakness occurs with migraine, the condition is either hemiplegic migraine or migrainous infarction. Hemiplegic migraine is a rare, familial condition of childhood. Migrainous infarction is a migraine attack complicated by stroke. However, if a stroke occurs during a migraine attack, it usually results in homonymous hemianopia rather than in hemiparesis. The occurrence of stroke with migraine is a one-time event and generally results in permanent symptoms.

2.24. Migraine as a symptom

Migraine - like symptoms may sometimes be caused by arteriovenous malformations, internal carotid dissection, epilepsy, mitochondrial DNA disorders (e.g. Mitochondrial encephalomyopathy with lactic acidosis and stroke like episodes MELAS), and by cerebral autosomal dominant arteriopathy with sub cortical infarction and leucoencephalopathy (CADASIL). Thus, like epilepsy migraine is a syndrome that can be caused by a wide range of cerebral disorders.

2.25. Alarm symptoms and signs

In patients with a typical history of migraine and an uneventful standard neurological examination ancillary investigations are redundant. The following alarm symptoms may warrant a scan.

- Aura symptoms always at the same side or with acute onset without spread or either of very brief (<5 min) or unusually (> 60 min) duration
- Sudden changes in migraine characteristics
- Sudden substantial increase in attack frequency
- Onset above age 50
- Aura without headache
- High fever
- Abnormal neurological examination.

A change in character of the patient's habitual headache must alert the physician to the possibility a cerebral tumour or some other organic disability.

2.26. Course and prognosis

The frequency of attacks of migraine varies considerably in different patients. Often the disorder seems to possess a rhythm, which is little influenced by outside factors. The attacks may occur once a week. Once a fortnight, or once a month with great regularity. Attacks un which headache occurs alone are usually more frequent than those in which it is preceded by sensory symptoms. The latter usually recur at intervals of several months.

Occasionally a patient has repeated frequent attacks, a condition which may be called status hemicranialis, by analogy with status epilepticus.

Headache preceded by visual symptoms may occur more than once a day for a period of days. Apart from treatment, attacks tend to grow less frequent and less severe as the patient grows older and usually cease in late middle life. It is not uncommon for the character of the attack to change. For example, visual symptoms may cease to appear or occur without headache. Migraine doesnot shorten life, but frequent severe and uncontrolled attacks may be exhausting and debilitating. Depression is a common accompaniment in middle life, especially in women, and vigorous treatment of the latter may improve the migraine dramatically. In some such cases it is difficult to be sure when migrainous headache ends and tension headache begins and in this circumstance the patient is rarely free from some form of pain in the head. In a small number of cases permanent hemianopia or other visual field defects have followed an exceptionally severe attack. In such cases teichopsia may persist for weeks.

Very rarely permanent aphasia and hemiplegia occur, but this should always suggest an organic lesion rather than migraine and angiography are usually indicated. Ultimately, on follow-up there is a significantly higher incidence of hypertension and of cardiac infarction, but not of stroke in sufferers from migraine (Leviton et.al; 1974).

2.27. Pathophysiology

There is a clinical evidence that at least three mechanisms are involved in the pathogenesis of migraine headache. These are Extra cranial

arterial vasodilation extra cranial neurogenic inflammation decreased inhibition of central pain transmission.

Extracranial arterial vasodilation was first studied in 1930's by Graham and Wolff. The artery preferentially involved in the mechanism of extra cranial vasodilation is the frontal branch of superficial temporal artery, giving rise to pain in temple, so characteristics of migraine. During the headache the artery is relatively dilated on the side of the pain. The dilation is relative, as there is generalised vasoconstriction during the migraine headache, probably caused by the increased activity of the sympathetic nervous system and responsible for the pallor of the face and coldness of the hands and feet.

Neurogenic inflammation is an inflammation caused by the release of chemicals from the primary sensory nerve fibers that are involved in pain transmission. These chemicals which include substance P, calcitonin gene related peptide, and neurokinin A, are released from the nerve fibers when they are activated. In migraine, the nerve fiber activation may be caused by the dilation of the extra cranial arteries. Because the extracranial arteries have nerve fibers that coil around them, dilation results in streteching and hence activation of these nerve fibers. In the 1950's Chapman and wolf first studied neurogenic inflammation as a mechanism involved in the pathogenesis of migraine headache. More recently, it has been observed that during the attack, the level of calcitonin gene-related

peptide is increased in the external jugular vein, calcitonin gene-related peptide in one of the chemicals involved in neurogenic inflammation and the external jugular vein drains the extracranial tissues.

2.28. Central Mechanism

Apart from neurogenic inflammation, there is probably also a central mechanism involved in the decrease in pain threshold at the site of the pain. Enkephalin is an endogenous opioid, which inhibits the transmission of pain signals in the central nervous system. Its level was found to be decreased during the migraine headache in comparison to the headache free interval and in comparison to controls. Biochemical studies have also revealed an intermittent release of 5 Hydroxy tryptamine (serotonin) into the circulation.

2.29. Examination

The physical and neurological examination of a migraine patient includes.

1. Auscultation of heart and carotid arteries
2. Blood pressure to exclude hypertension
3. Fundoscopic Exam (Focal signs are rare unless there has been migrainous cerbral infarvtion or there is an underlying lesion. Horners syndrome may be found in migrainous neuralgia and persists sometimes between attacks, ophthlmoplegia and cycloplegia may persist in ophthalmoplegic migraine.

4. Examination of cranial nerves
5. Checking of deep tendon reflexes
6. Palpation of peripheral pulses
7. Palpation of neck and head muscles
8. Evaluation of movement and balance
9. A mental status examination (can be done while obtaining the history).

2.30. Investigations

Usually the diagnosis of migraine is made by taking good history, clinical examination and its follow up. For patients with a clear history of migraine and normal findings from neurological examination investigations have an extremely low yield.

- Routine haematological tests
- X-ray skull- Posteror anterior and lateral view
- Ophthalmoscopy
- Lumbar puncture to study CSF pressure cytology and biochemistry
- Electro encephalogram

Special Investigations

- Carotid and basilar angiography

- Pneumo encephalography
- Brain scanning
- C.T.Scan
- SPECT Scanning (Single- Photon Emission tomography)
- PET (Positron emission Tomography)

Routine haematological tests are worthwhile since anaemia and polycythaemia may exacerbate migraine.

Thrombocytopenia has been shown to be associated with the appearance or exacerbation of migraine possibly because of the excessive release of 5-HT from platelets, which are being destroyed. Plain X-rays of skull may show calcification in vascular malformations or tumours and occasionally provide evidence of raised intracranial pressure. Specialised neuroradiology is not indicated unless headache or focal features always recur on the same side or there are persistant neurological signs. EEG changes, focal changes correlating with the site of neurological symptoms in classical attacks. Persistent lateralized or localized EEG abnormalities are not, in themselves an indication for further investigation. There is some evidence that the morbidity of carotid angiography is higher in patients with migraine than in those with other neurological disorders.

CT scanning is likely to reveal evidence of infarction in patients with persistent neurological deficit.

2.31. Treatment of Migraine

Treatment of migraine is of two kinds, Pharmacological and Non-pharmacological. Drugs may be used in the acute abortive therapy as well as in the prophylactic therapy.

Treatment for an acute attack should result in mild or no headache by two hours after drug ingestion; while prophylactic treatment should result is 50% reduction in frequency of attacks. Non-pharmacological treatment consists of general measurements, physiological counseling behavioral managements and relaxation therapy.

Most patients with frequent headaches arefrom psychological counseling and relaxation therapy. Dietary restrictions include avoidance of recognizable triggering factors.

Treatment of Acute attacks

The treatment of an acute attack of migraine can be divided into;

1. Non specific treatment
2. Specific treatment

Non-specific treatment covers up the symptoms with an action that includes analgesia.

Specific treatment includes anti migraine drugs, which can arrest the migrainous process with out aving a direct analgesic action.

Preventive Treatment

The aim of preventive treatment is to reduce the frequency and severity of attacks while keeping side effects to a minimum.

Preventive treatment is indicated only for patients who have sufficiently frequent attacks that are not relieved by treatments for acute attacks.

No one drug is clearly superior when its potential side effects are also considered as migraine is one of the psychosomatic disorder practices preventing psychosomatic disturbances, changes in the life style and behavioral pattern might yield much to the prevention of migraine. These practices are to be followed should be made part of life. Some of which are;

1. One should not deviate from generally approved principles nor one should break any code of conduct.
2. One should not be in the habit of postponing things nor should one indulge in any activity with out proper examination.
3. One should not be a slave to the senses nor should let loose his fickle mind.
4. One should not inflict too much burden over the intellect or the senses.
5. One should avoid over dilatory practices.
6. One should not do things in a fit of anger or rejoicing.

7. One should not be under continuous grief.
8. One should not be conceited over achievements nor be desperate in loss.
9. One should always remember his own nature.
10. One should have faith in the correlation of cause and effect and should always act on it.
11. One should not be complacent about his own action.
12. One should not lose spirit nor one should remember his insults (Ch.Su.8.27).
13. One should not be impatient or over bold.
14. Neglect the maintenance of servants.
15. One should have non-reliance on his own kins man.
16. One should not enjoy alone.
17. One should not have uncomfortable character, conduct, manners and diseases.
18. One should neither rely on every body nor suspect every body.
19. One should not be to meticulous at all time (Ch.Su. 8/26).
20. One should not speak ill of noble persons and teachers.
21. One should follow the path of knowledge, charity, friendship, compassion, happiness detachment and peace.

Prevention of *Ardhavabhedaka*

1. Natural urges are not to be suppressed
2. Day sleep is to be avoided
3. Night awakenings is also contra indicated
4. Exposure to sun, smoke snow, dew, should be restricted
5. The food which is excessive rough (athirooksha) is to be avoided
6. Eating only when the food taken previously is digested
7. Regular following of dhinacharya, rithucharya and other regimens.

Prevention through Pranayama

To succeed in the search for health and well being one need to establish a diet and life style that will sustain and promote a positive approach. According to *yoga*, diet has a profound effect on both body and mind and one cannot attain true mastery over mind without balance in the diet and life style. According to *yoga* food is classified into three categories.

1. *'Satvic'* or food which is the most health promoting, adding vitality and energy to the whole body in the balanced way.
2. *'Rajstik'* or food which tends to raise levels of physical activity and lead to emotional upsurges and is detrimental in the long-term

3. '*Tamasic*' or food, which have a negative or harmful effect on the body and mind.

Yoga always prescribes the '*Satvic*food'. The food that are purest, fresh, fragment tasty. They include organically grown natural foods without additives such as fresh green vegetables, fruits, cereals, diary products, nuts and seeds.

These help to maintain clarity of thought, decision-making and intellectual and contemplative thinking and keeps more joyful, cheerful and calm. The aim behind consuming *satvic* food is to achieve moderation, which is the basis of balanced diet in pranayama, and removes over indulgence in any form of food. Intake of stimulant drinks saucy, as tea, coffee and soft drinks should be reduced gradually.

The way we eat is also important in *yoga*. Eating is regarded as scared act. We should try to have our meals in a quiet pleasant frame of mind giving full attention to the food allowing our body to turn its resources to the task of digestion.

The same *yogic* principles as for diet apply to the other aspect of daily life. The general aim is to establish a well-ordered calm life.

3. SIRAS

In a living being the *siras* (head) is the substratum of "élan– vital" and all the sense faculties. So it occupies the place amongst the vital organs of the body.

Synonyms of Siras

Mastaka, Urdhakaya, Urdhwanga, Uttamanga, Munda, Seersha, Urdhwahridaya Urdhwajatru, Urdhwakaphasaya.

Importance of Siras

Adharva veda mentions *siras* as *devakosh*. *Taittareeyopanidhad*

mentions *siras* as *manomayakosha*. *Saktyopanishad* while stating the importance of *siras* says that the power of *chittah* is concentrated in the centre of *"Bhru" pradesha* which is present in the *siras* so *siras* is considered to be *uttamanga*.

According to *Yogasastra* siras is considered to be the seat of *sahasrarachakra*. The texts of palmistry considers the *"Sirshodayakala"* (i.e. the time of delivery of the head) as the time of birth of an individual in fixing up the horoscope. *Amarakosha* mentions the synonyms such as *"Uttamanga" "Siram"* and *"Sirsham", sounaka* while participating in the discussion of division of *Angapratyanga*, states that *siras* is the first organ to be formed. *Bhela* while stating the seat of *siras* says that it is *"Talwantargatah"* and uses the terminology *Sirohridaya*.

According to *Charaka siras* is the seat of *prana* and all the sense organs. *Chakrapani* commenting on this statement states that *prana* over here can be considered as *pranavata* as the seat of *pranavata* is the *siras*. *Siras* is also the seat of *prana* which is the composite of *agni, soma, vayu, satwa-rajo-tamo gunas,* five sense organs and *panchabhutas*. *Charaka* mentions *siras* as one among the *"Trimarmas", (siras, hridaya, vasthi)* while stating the *dasapranayatanas*. While the ancient cultures were considered the *siras* was given the importance.

It can be observed that the highest punishment ordered by the

kings in the Ancient India was the *Sirah Khandana* i.e the death sentence *siromundana* was also a type of punishment given. Bowing the head in the head in front of God and elders shows that we dedicate ourselves to them.

Charaka, stating that the importance of *siras* states that in head senses, channels carrying them and vital breath are located as rays in the sun (Ch.Si.9/4*) Susrutha*, keeping the *sareera rachana* and *sirorachana* in view states that *siroabhighata* leads to immediate death, *unmadha* and *bhaya*. *Vagbhata* also states that as all the *indriyas* and the *prana* are seated in the *siras* and there is a need for its protection. (A.H.Ut.24/57). *Vagbhata* compares *siras* to an *aswatha vriksha* which has the *urdhamoola* and *adhahshakas* (Ah.Ut.14/58).If the whole body is considered to be an *aswatha vriksha* then the *siras* can be compared to be its root.

The destruction of roots leads to the destruction of the whole tree. In the same way the disease of the head must also be pacified immediately with utmost care or the whole body may be affected. *Charaka* while stating the importance of *trimarmas* states that there are one hundred and seven vital parts in the body located in trunk and extremities. In case of affliction of any of them there is excruciating pain because any of the specific attachment of conscious to them. Of them those located in trunk are more important than those located in extremities because the latter are dependent on former. Of them also the *hridaya*, *vasti* and *siras* are the important ones because they are the roots of the body (Ch.Si.9/13).

Any injury or damage to the *trimarmas* may affect the body immediately as by the destruction of substratum the dependant is also destroyed. By their affliction, severe disorders appear. Hence these should be protected particularly from external injury as internal factors (Ch.Si.9/15).

The preventive measures were also stated for the diseases of heart, head and urinary bladder. The vital breath of man resides in heart, head and urinary bladder. Hence one should make every effort to protect them. The protection includes avoidance of impending factors, observance of code of conduct for the healthy and remedy of disorder if acisen (Ch.Si.9/9,10). If all the above said points are considered, Siras can be definitely given the status of the Uttamanga.

4. SIRASOOLA

Ardhavabhedaka is mention in *Charaka samhitha, Ashtanga hridaya* and *Susrutha samhitha*. *Susrutha* has defined *shoolas* an excruciating pain, which is felt as pierced by a *shanku* (a spear), into any part of the body.

Both sensory and motor faculties of the nervous system come under the domain of *vatha*. It is a known fact that pain is perceived by the specialized sensory nerve endings and signals transmitted to brain for appropriate physiological adjustments. Thus, *shoola* can be held as a disorder in which, functions of *vatha* are compromised and impaired. Strictly

according to the Ayurvedic method of understanding the pathogenesis, it can be summarised that vitiation of *vatha dosha* is the main pathological hallmark in the genesis of *shoola*.

Pain is of many types and is chiefly a subjective matter as which type of pain the patient experiences. Cutting pain, piercing pain, throbbing pain, and penetrating pain, unexplainable pain-yes- pain cannot be categorized. Likewise, *shoola* and *ruja* are only two varieties of pains, thought it can be safely said that *shoola* applies to visceral structures, where as *ruja* chiefly is held as pain connected with bones, joints etc. In the case of the *uthamanga* (head), both *ruja (siroruja)* and *shoola (shira shoola)* are used. further; *shoola* is regarded as an inflammatory type of pain. While discussing the role of *doshas* in the manifestation of *paka*, *Vaghbhata* has emphasized this fact. The word *thoda* also finds application *(shirasthoda)* . The ancient Hindu legend goes on narrating *shoola* in relation of the voracious hunger of Lord *Vishnu*.

While describing the patho-symptomatology of *sira-soola*, it has been narrated that the vitiated *Vatha dosha* consequently produces severe, drilling type of pain (as the labyrinthine interior of the *shanku)* in various regions of the cranium, which is translated by the individual as head ache. How ever, headache is postulated as only a symptom found in umpteen disorders of any part of the body, not necessarily the cranium alone, according to the latest medical experts.

Symptomatically, headache is a condition ranging from a simple unpleasant feel to an intolerably disastrous pain. By its very nature, pain is subjective and complex. It is not easily measured, diagnosed, or treated. Chronic pain is often debilitating and has devasting consequences for its sufferers and those around them. Chronic pain affects a patient's physical and emotional well being a challenging problem that often requires specialized care.

To understand pain management, we need to appreciate how pain is very complex. We can't "pain" in a test tube to study it. Also, pain *perse*, can't be seen in an X-ray or MRI. Pain is experienced!

When pain is severe, it affects a person's life. People who suffer from severe pain are often restricted in their activities in both work and play. Pain can also interfere with sleep and concentration. Thus, either directly or indirectly, pain can influence one's emotional well- being. To add to this complexity, one's activities can also affect pain. Too much physical activity at one time can aggravate an injury. Conversely, insufficient activity can lead to weak muscles. Since the body's muscles act as "shock absorber", " weak muscles" can lead to more pain.

Emotions themselves can also affect pain. A simple example of this is how stress can cause the body's muscles to tense, which often leads to more pain! Also, if one becomes depressed, one has more time to focus on one's pain. Current research is constantly revealing more and more

information regarding "mind and body" connections. One important example includes neurotransmitters, chemicals used by the brain and nervous system for the transmission of information. Certain neurotransmitters can increase pain signals in the nervous system while others apparently decrease pain signals. Not surprisingly, neurotransmitters affect brain functions including emotions.

5. PARA NASAL SINUSES

Para nasal sinuses are air filled spaces present with some bones around nasal cavities. They are frontal, maxillary, sphenoid and ethmoid. All of them open into the nasal cavity through its lateral wall. Functions make the skull lighter and add resonance to voice.

Anatomy of the sinuses (also called paranasal sinuses): The human skull contains 4 major pairs of hollow air–filled sacks called sinuses. These connect the space between the nostrils and the nasal passage. Sinuses help insulate the skull, reduce its weight, and allow the voice to resonate within it.

- Frontal sinuses (in the forehead)
- Maxillary sinuses (behind the cheek bones)
- Ethmoid sinuses (between the eyes)
- Sphenoid sinuses (behind the eyes)

The **sinuses** are a set of four areas of hollow cavities that are located in the skill and can range from an inch or smaller in size. There are a few theories on the purpose of **sinuses**, which are that they help to enhance vocals, and that they act as humidifiers for the air that's breathed in. They are usually empty except for the presence of a pink tissue that's layered within.

The largest sinus cavities are located in the cheekbones, while the ethmoid **sinuses** can be found at the nasal bridge

The **sinuses** are a set of four areas of hollow cavities that are located in the skill and can range from an inch or smaller in size. There are a few theories on the purpose of **sinuses**, which are that they help to enhance vocals, and that they act as humidifiers for the air that's breathed in. They are usually empty except for the presence of a pink tissue that's layered within.

The largest sinus cavities are located in the cheekbones, while the ethmoid sinuses can be found at the nasal bridge.

5.1. Frontal sinus

Frontal sinus lies in the frontal bone deep to super ciliary arch extent upward above the medial and of eyebrow and back ward into the medial part of the roof of the orbit.

Open into middle meatus of nose at the anterior and of hiatus semilunaris.

Left and right sinuses are unequal in size, rarely one or both may be absent.

- Height X width X anterior posterior depth = 2.5 cm.
- Better developed in males than females
- Arterial supply – supra orbital artery
- Venous drainage – in to the anastomatic vein (supra orbital vein and superior ophthalmic vein)
- Lymphatic drainage – sub mandibular nodes
- Nerve supply – supra orbital nerve

5.2. Maxillarysinus

Maxillary sinus lies in the body of maxilla, largest paranasal sinus pyramidal shape. Open into middle meatus of nose in the lower part of hiatus semilunaris.

Left and right sinuses are unequal in size, rarely one or both may be absent.

- Height X width X anterior posterior depth

  = 3.5 cm X 2.5 cm X 3.5 cm
- First Para nasal sinus to develop
- Arterial supply – facial, infra orbital, greater palatine artery
- Venous drainage – Facial vein
- Lymphatic drainage – sub mandibular nodes
- Nerve supply – infra orbital, alveolar nerve

5.3. Sphenoidal sinus

Sphenoidal sinuses lies with in the body of sphenoid bone left and right sinuses are separated by a septum

Sinus open into sphenoethmoidalrecess of the corresponding half of nasal cavity.

- Related superiorly – chiasma and hypophysis cerebri
- Laterally – internal carotid artery and cavernous sinus
- Arterial supply – Post ethmoidal and internal carotid artery.
- Venous drainage – cavernous sinus
- Lymphatic drainage – Retro pharyngeal nodes
- Nerve supply – Posterior ethmoidal nerve and branches of pterygo palatine ganglion.

5.4. Ethmoidal sinus

Numerous small inter communicating spaces lie with in the labyrinth and ethmoid bone. They are completed from above by the sphenoidal conchae and the orbital process of the palatine bone and antriorly by lacrimal bone.

Sinus divided into anterior, middle and post group.

Anterior

- Made up of 1—11 air cells
- Open into anterior part of hiatus semilunaris of nose
- Lymphatic drainage — sub mandibular nodes
- Nerve supply — Anterior ethmoidal vessels and nerves.

Middle

- Made up of 1—7 air cells
- Open into middle meatus of nose
- Lymphatic drainage — sub mandibular nodes
- Nerve supply — posterior ethmoidal vessels and nerves

Posterior

- Made up of 1—7 air cells
- Open into superior meatus of nose
- Lymphatic drainage — Retro pharyngeal nodes

- Nerve supply – posterior ethmoidal vessels, nerves and orbital branches of pterygo palatine ganglion.

5.5. Sinus Infection

Sinus infection, or sinusitis, is an inflammation of the sinuses and nasal passages. A sinus infection can cause a headache or pressure in the eyes, nose, cheek area or on one side of the head. A person with a sinus infection may also have a cough, a fever, bad breath, and nasal congestion with thick nasal secretions. Sinusitis is categorised as acute (sudden onset) or chronic (long term, the most common type).

The sinuses contain defenses against foreign bacteria (germs). If a disruption occurs that affects the normal host defenses inside the sinuses, those defenses may allow bacteria, which are normally present in the nasal passages, to enter any of the sinuses. Once there, the bacteria may stick to the lining cells and cause a sinus infection.

Acute sinusitis usually lasts less than 8 weeks or occurs no more than 3 times per year with each episode lasting no longer than 10 days. Medications are usually effective against acute sinusitis. Successful treatment counteracts damage done to the mucous lining of the sinuses and surrounding bone of the skull.

Chronic sinusitis lasts longer than 8 weeks or occurs more than 4 times per year with symptoms usually lasting more than 20 days.

These sinuses are covered with a mucus layer and cells that contain little hairs called cilia on their surface. These help trap and propel bacteria and pollutants outward. The ostiomeatal complex (OMC) connects the nasal passage to the Para nasal sinuses.

5.5.1. Sinus Infection Causes

Acute sinusitis usually follows a viral infection in the upper respiratory tract, but allergens (allergy–causing substances) or pollutants may also trigger acute sinusitis. A viral infection causes damage to the cells of the sinus lining. This damage leads to inflammation. The lining thickens with fluid that obstructs the nasal passage. This passage connects to the sinuses. The obstruction disrupts the process that removes bacteria normally present in the nasal passages, and the bacteria begin to multiply and invade the lining of the sinus. This causes sinus infection symptoms. Allergens and pollutants produce a similar effect.

Bacteria that normally cause acute sinusitis are stretococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis. These micro-organisms, along with Staphylococcus aureus and anaerobes (bacteria that live without oxygen), are involved in chronic sinusitis.

5.5.2. Sinus headache

A sinus headache is the result of trapped or congestion mucus building up in the para–nasal sinus cavities; this results in pain and

pressure felt around the eyes, temple, cheeks, upper teeth and forehead regions.

If you are experiencing any of the above you could be suffering from a sinus headache.

Your sinuses are bony air–filled cavities in your head that are connected to your nose through small openings (ostia). When you get a cold, a sinus infection or have an allergy attack these openings can become infected; the mucus membranes inflamed and the entire cavity blocked by excess mucous which is unable to drain. It is this excess mucous that creates the pressure in your head and ultimately the painful sinus headache you feel.

Everyone experiences sinus headaches differently with regards to their levels of intensity and duration. Sinus Headaches can range from a minor nagging pain in the head region to pain so unbearable that one cannot even sleep or continue life normally.

Symptoms

The following are symptoms of Sinus Headaches:

- Headaches with congestion
- Pain and pressure around the eyes, ears, across the cheeks and forehead
- Ache feeling in the upper teeth

- Fatigue, fever and cold shivers
- Facial swelling
- Head pain which feels like a tension headache or migraine

In some cases one may suffer with sinus headaches even if no accompanying sinusitis symptoms are experienced.

Sinus symptoms which may be associated with Sinus Headaches:

- Post nasal drip
- Colored mucus (mucus may be yellow or green in colour)
- Blocked nasal passages
- Throat irritations or coughing
- A light–headed feeling

Causes of Sinus Headaches

- Exposure to cold, an allergy or the development of a sinus infection can cause swelling of the mucous membranes and result in congestion. In cooler weather climates or cold weather such as during fall or winter, the severity of sinus headaches may increase.
- Environmental triggers, such as mold, pollen, and cigarette smoke can also intensify the frequency and severity of sinus headaches.

- Bending forward or lying down can at times make your sinus headache worse.
- Sinus Headaches have been found to be a result of Allergic Rhinitis.
- Respiratory infections can cause sinus headaches.
- Nasal irrigation – using a neti–pot or saline sprays has tremendous benefits.

Some people experience headaches unrelated to sinuses, which could actually be:

- Tension headaches: caused by muscle contraction and stress.
- Migraines: usually intense, may be throbbing and pounding or felt more on one side of the head.
- Cluster headaches: rare headaches that occur in "clusters" and are relatively short in duration, but cause tremendous pain.

The key to treating a sinus headache is to follow 3 easy steps:

- Identify if the pain and pressure you are experiencing is a sinus headache.
- Reduce any mucus membrane swelling and inflammation in the sinus cavities and nasal passages.
- Promote effective drainage of any trapped or blocked mucous in these areas.

Here are some other things you can do at home to lessen the effects and pain of sinus headache:

- Drink plenty of fluids to thin the secretions and keep them flowing.
- Take hot showers to loosen the mucus.
- Alternate hot and cold compresses– place the hot compress across your sinuses for 3 minutes, then the cold compress for 30 seconds.
- Nasal irrigation – using a neti–pot or saline sprays has tremendous benefits.

Some people experience headaches unrelated to sinuses, which could actually be:

- Tension headaches: caused by muscle contraction and stress.
- Migraines: usually intense, may be throbbing and pounding or felt more on one side of the head.
- Cluster headaches: rare headaches that occur in "clusters" and are relatively short in duration, but cause tremendous pain.

6. MARMA OF SIRAS

Among the one hundred and seven *marmas* in the body *charaka* maintains that *hridaya vasthy* and *siras*, as the important. They are the main seats of *prana*, and hence when they are injured, it will affect the *prana* thereby vitiating the humours.

Chakrapanidatta comments that injuries on these vital organs affect the prana as it is seated here. He compares this to the destruction of wall paint which occurs simultaneously when the wall is destroyed. Any

destruction to any of these three vital organs will destroy the *prana* and also could turn fatal or cause irreparable damage.

In *sidhisthana, Charaka* emphasizes the importance of these three *marmas* in relation to other *marmas*. He says that there are one hundred and seven *marmas* including the *shakhas* represents *antaradhy* and the *sira*. He says that pain will be in these parts when injured than that of any other part of the body. This is because the *chetana* is seated in this area. Here also *Charaka* describes *siro marma* as one.

Sankha Adhipa, Sringataka and *Matruka* are *siromarmas* included in *sadhyapranahara* marmas In Ashtanga hridaya Vaghbata says that there are ten jeevitha *dhamas namely Sira, rasanabandanam* (posterial part of the tongue) etc. *(Khanda, Rak*tha, Nabhi, Asthi, Sukra, Oja and Guda).

6.1. Siras

The *siras*, being, the nerve centre governing all nervous activity of the commands a position of paramount significance. It is intimately related to the sense of perception and is the centre of *prana* as well. It is therefore justified being spoken as *Uttamanga*.

It is the principal site for the formation of *kapha* is indicative of its origin in the *siras*.

The body is considered as a tree, upside down, comparing the root as sira and appendages as branches throw light on the importance of *siras*.

Being the centre of the *prana* and *indriyas*, it is to the body what the sun is to the sky.

6.1.1. Marma of head and neck

There are thirty seven *marmas* in the head and neck region.

Sl.No.	Name	Asraya	Prognosis	No	Extend
1.	Nila	Siramarma	Vaikalyakaram	2	4panithalam
2.	Manya	Siramarma	Vaikalyakaram	2	4panithalam
3.	Matruka	Siramarma	Sadhyapranaharam	8	4panithalam
4.	Krikadika	Sandhimarma	Vaikalyakaram	2	½ panithalam
5.	Vidhura	Snayumarma (Dhamanimarmam)	Vaikalyakaram	2	½ panithalam
6.	Phana	Siramarma	Vaikalyakaram	2	½ panithalam
7.	Apangam	Siramarma (Snayumarma)	Vaikalyakaram	2	½ panithalam
8.	Avarthana	Sandhimarma	Vaikalyakaram	2	½ panithalam
9.	Sankha	Asthimarma	Sadhyapranaharam	2	½ panithalam
10.	Utkesepa	Snayumarma	Visalyaghnam	2	½ panithalam
11.	Sthapani	Siramarma	Visalyaghnam	1	½ panithalam
12.	Sringataka	Siramarma	Sadhyapranaharam	4	4panithalam
13.	Simanta	Sandhimarma	Kalantharapranaharam	5	4panithalam
14.	Adhipathi	Sandhimarma	Sadhyapranaharam	1	½ panithalam

Among the above said thirty seven *marmas* there are 15 *Sadhyapranaharamarmas.*

1.	Sankha	- 2	2.	Adhipa	- 1
3.	Sringataka	- 4	4.	Matruka	- 8

There are only three *vaishalyaghna marma.*

1.	Sthapani	- 1	2.	Utkshepam	- 2

There are five *Kalanthara pranahara marma*

1.	Seemanthas	- 5

There are 14 *Vaikalyakara marmas*

1.	Phana	- 2	2.	Apanga	- 2
3.	Vidhura	- 2	4.	Nila	- 2
5.	Manya	- 2	6.	Krikatika	- 2
7.	Avartha	- 2			

There is no *marma* in *siras* which is in *rujakara* group. Among 37 *marmas* there are–

Siramarma	- 15	Dhamanimarma	- 06
Sandhimarma	- 10	Snayumarma	- 04
Asthimarma	- 02		

Based on the dimensions the *siromarma* are classified into;

Swapnithala parimana	- 04
Ardhangula parimana	- 33

Generally, injury to any of the *siromarmas* will lead to wry neck, facial paralysis, deviation of the eyes, loss of motor function, cough, difficulty of breathing, lock jaw, dullness, slowness of speech, closing of eyelids, tremor of the cheek, yawning, salivation, loss of voice.

6.2. Nila and manya marma

According to *Vaghbata*, there are four *siras* on either sides of *kantanadi* corresponding to *hanu sandhi* (Tempero mandibular joint) named as *Nila* and *Manya*. If subjected to injury they cause absence of voice, alteration of sound, loss of sense of taste.

Susrutha says that there are four *damani* on either sides of

kantanadi. Two of them are known as *Nila* and other as *Manya*. One *nila* and one *Manya* are situated on either side of Larynx. An injury to any of these produces dumbness and change of voice. This is a *Siramarma*, and *vaikalyakara marma*.

6.3. Apanga marma

The site of this *marma* is near the external canthus of eyes and below the lateral end of the eyebrows. Injury to this lead to blindness or impaired vision by trauma to the optic nerves and other nerves supplying eye on its lateral margin.

This is included in the *siramarma* by *Susrutha*, where as *Vaghbata* puts this in *snayu marma* group. They are grouped under *vaikalyakara marma* and are two in number.

Anatomical structures corresponding to this marma

- Zygomatic and Temporal vessels
- Zygomatic and Temporal nerves
- Ophthalmic division of fifth cranial nerve (Trigeminal-Lacrimal nasociliary and frontal)
- Sixth cranial nrve supplying rectus lateralis muscle (Abducent)
- Trochlear and occulomotor nerve.

Injury to this cause paralysis of the lateral rectus and affects the movement of eyeballs. Injury to lacrimal nerve decrease the secretion of tears. This will lead to improper diminished vision.

6.4. Sankha marma

The site of the *marma* is in between the ear and the eye brows just above the termination of the super ciliary arch. It corresponds to temple. Injury to this *marma* endangers life.

They are two in number. Their *ashraya* is *asthi*. They come under *sadya pranahara* group.

Anatomical structures corresponding to this marma

- Temporal bone of the skull
- The temporal lobe of the brain
- Basal ganglia
- Superficial temporal artery
- Middle meningeal artery.

6.5. Utkshepa Marmam

The situation of this *marma* is above the *sankha* and near the hairy margin on the scalp on both sides of head. Injury to this *marma* by a foreign body keeps the person alive as long as it is kept within the wound or it falls down on its own accord, after the formation of the tissue

which acts as a barrier between the foreign body and the injured tissue of the body. But if it is drawn out immediately after the injury, the person dies at once due to bleeding. They are two in number and its prognosis is *Visalyaghna* in nature.

Anatomical structures corresponding to this marma

- Temporal fascia
- Parietal branch of superficial temporal artery
- Zygomatic temporal nerve
- Temporalis muscle.

6.6. Sthapani marmam

The site of this *marma* is in - between the two super ciliary arches underneath the bony vault. Injury to this *marma* leads to same consequence of *Utkshepa marma*. If the foreign body is removed from the wound immediately after the injury, severe bleeding results in brain through the vein communicating the big *siras* resulting in loss of nerve energy and death. Its *ashraya* is *sira* and prognosis is *Visalyaghna* in nature.

Anatomical structures corresponding to this marma;

- A vein from the nose entering through the formen caecum joints the superior sagittal sinus
- The brain with its covering underneath the frontal bone corresponding to marma

- Glabella
- Emmissary vein
- Superior sagittal sinus.

6.7. Seemantha Marmam

They are five in number and is included in the *Kalanthara pranahara* marma . The situation of this *marma* is on the scalp. They correspond to the five important sutures of the skull. Injury to these marmas lead to insanity, fear and intellectual disturbances from trauma. They comes under the *sandhi marma* category. Prognosis is *Kalanthara pranahara*. The *seemantha marma* can be corelated to sutures, which are seen around the scalp.

Anatomical structures corresponding to this marma

- Sagittal sutures
- Parietal sutures
- Occipital sutures
- Frontal sutures

6.8. Sringataka

In the middle of the siras that irrigate the nose, ear, eye and tongue, there is a cross way or the *sringatakas*.

They are four in number. According to *Susrutha* they are *dhamani marma*. They are *sadyapranahara marma*. The site of this *marma in thalu* (soft palate) where the cavities of the four indriyas (the sense of taste, hearing, smell and vision) meet . Any injury here will lead to bulbar paralysis and above said symptoms. The opening of all these in the *thalu* are termed as *sringataka marma* which are four in numbers.

Being a *siramarma* and four in number this is also suggestive of the Circulus arteriosus of Willis.

Anatomical structures corresponding to this marma

- Brocas centre
- Visio sensory centre
- Centre of hearing
- Centre for taste and smell
- Soft palate.

6.9. Adhipathi Marma

With in the vault (crown) of the head above there is commingling (together) of the *siras* and joints. This is like the whorls of the hair and is called the *adhipathi*, the master. If injured this leads to immediate death.

It comes under *sandimarma* category, *sadyapranahara* in prognosis

according to *Gananathasen, Adhipathi marma* is the junction of five *siras* termed *mahasiravartha.* It is a *sadyapranahara marma.* It is seated inside the *paschima kapala.* In another context he says that this *marma* is *a randra* in the *paschima Madhya seemantha* of *kapala.*

This is that part in the body which, when injured causes severe pain, respiratory and circulatory failure and in blood pressure.

The description is a template for brain and the whorls of hair are suggestive of convolutions, sulci and gyrii of the cortical surface.

The situation of this is with in the cranial vault. It correspond to an area called Medulla oblongata *(Adhipathi)* in the mid brain nearer its surface- where the ten cranial nerves of both the sides take their origin as nuclei from the middle line appearing as if hairs spread out in emicircular manner of each side.

Anatomical structures corresponding to this marma

- Medulla oblongata
- Cardiac centre
- Respiratory centre
- Vasomotor centre
- Nuclei of ten cranial nerves.

7. NASYAKARMA

Nasyakarma is one among the Panchakarma. The importance of administering medical treatment through nostrils was realised very early in India both for prophylactic and curative purposes. This operation is useful in cases pertaining to head, eyes, ears, nose etc. The nasya dravya administered through nostrils reaches the sringataka srotas and from there again it spreads into various srotas and brings about the vitiated doshas from urdhanga to sringataka which is a sadyapranahara sira marma. It is a composite structure consisting of four siras in connection with four

sense organs i.e. nose, ear, eye and tongue. As sringataka is the most important group of srothas in urdhwanga, drugs acting through these srotas are certain to bring about srotho sudhi in urdhawanga. Nasyakarma is also called siro virechana. Most of the drugs bring about the draveekarana, vilayana and chedana of vitiated doshas. Purging out of the vitiated doshas which have their stay in siras is called siro virechana. According to the views of some of the authors the action of Nasyakarma may be analysed as

1) by general blood circulation after absorption through nervous membrane
2) by direct pooling into venous sinuses of brain via inferior ophthalmic viens
3) by absorption directly into csf.

Many nerve endings which are arranged in peripheral surface of nervous membrane olfactory, trigeminal etc will be stimulated by nasyadravya and impulses are transmitted to the CNS resulting in better circulation and nourishment of the organs. The chief function of the nose is to warm the air while it passes through the labyrinths of the intricate passages into the nose and also to filter the air of certain impurities contained in the atmosphere.

Nasyakarma is specially recommended in diseases of head, back of the throat and ears. It is aimed at cleansing and elemination of offending

agents. while in others the fragrance of meterials used for Nasya is believed to enter into the intricate passages in the sphenoidal and ethmoidal sinuses and acts as a disinfectant and stimulant. Nasyakarma hasa been prescribed regularly and is found to be specially used in insanity. The counter irritation caused by the irritant remedies used in nasyakarma has been found to be useful.

Before performing the Nasyakarma as a preoperative stage local snehana and swedana are done. Then the patient is made to lie down on his back with his head bent a little backward. The luke warm medicine is instilled after closing one nostril and the medicine is put into the other nostril and viceversa. After the administration of nasya the palms soles and ears are to be massaged for a little while. Dhoomapana and gandoosha are done as the post operative procedures. The patient is supposed to avoid the dirt, smoke. sun, wind, liquor, liquid foods, full bath, journey and mental emotions like anger etc. during this period. If the nasya is administered properly the patient should feel lightness of the head and the should have good sleep without any disturbance.

7.1. Types of Nasya

Charaka has classified into 5 types;

Naavana nasya : *Navana* is one of the important and well applicable therapies of *Nasya Karma*. *Navana* is administered by instilling the drops of a medicated oil or *ghritha* in the nose. *Charaka* has described

Pranadi (dropper) for it. *Navana* is generally the *Sneha Nasya* and known as *Nasya* in general.

Snehana (unctuousness)

As the word Sneha suggests, sneha nasya gives strength to all the Dathu and as Dathuposhaka.

Dosage Schedule for Sneha nasya

Type of dose	Dose
Heena matra	8 drops in each nostril
Madhyama matra	16 drops in each nostril
Uttama matra	32 drops in each nostril
Boja has mentioned	8 drops → Prayokika Sneha nasya
	16 drops → Snaihika nasya.

Benefits of *Sneha Nasya*

1. Who practices *nasya* at the proper time will keep sight, smell and hearing unimpaired
2. Beard and hair will not grow in abundance
3. Hair will not fall turn grey or tawny.
4. Rigidity of neck, head ache, facial paralysis, rhinitis, *hemicrania (Ardhavabhedaka)* and tremors of the head will be pacified.

5. The joints, sinus and tendons of cranium will be well nourished by the *nasya and* will acquire great strength
6. The face will be cheerful and plump; the voice will become mellow, firm and stentorian
7. All sense organs will be clarified and greately strengthened
8. There will be no sudden invasion of disease occur in the upper part of the body (Urdha jatru)
9. The effects of senility will be retarded.

Sodhana Nasya

Susrutha's sirovirechana type is included in sodhana type od Navana nasya. It eliminates the vitiated dhosha.

Type of dose	Dose
Heena matra	4 drops
Madhyama matra	6 drops
Uttama matra	8 drops

Indication

Ardhavabhedaka, urdha jatrugatha kapharogas,urdha jatrugatha sopha, sirogaurava, sirasoola, etc.

NavanaKala

Season	Time of Nasya
Seetha kala	Noon
Sarath and Vasantha	Morning
Grishma Ritu	Evening
Varsha Ritu	Sunny day

Avapeeda Nasya

It is a type of sodhana nasya. The word Avapeeda means it is extracted juice of leaves or paste (Kalka) of required medicine is prepared which is placed in white and clean cloth and is squeezed to obtain the requ ired quantity of juice, directly into the nostril of the patient.

It is mainly of two types:

1. Sthambana Nasya
2. Sodhana Nasya

For sodhana purpose Kalka of Tikshna Dravya like saindava, Pippali etc. have been mentioned as Avapeeda Nasya and for Sthambana purpose Sthambana drugs have been described.

Chakrapani has mentioned 3 types of Avapeeda Nasya: Sodhana, Sthambana and Samana.

Pradhamana or Dhmapana Nasya

It is a type of Sodhana Nasya. Blowing of fine powder into the nose is called as Pradhamana nasya. Dhmapana mentioned in Charaka and Pradhamana described in Susrutha.

Method

In pradhamana nasya, choorna (powder of drug) is administered by nasal passage with the help of Nadiyantra. Videha has described another method for Pradhamana, in which fine powder of drug kept in a podali made athin cloth is used to inhale, so that smallest particles of the medicine enter into the nostrils. Dose of Dmapana nasyais three mucyuthi (3 pinch).

For the Pottali method choorna should be 2 thola i.e. 20 gms.

Dhuma Nasya

Dhooma nasya is defined as medicated smoke inhaled through nose and exhaled through oral route. *Acharya Susrutha* had not described it as a type of *nasya*. The inhalation and exhalation of *Dhuma* through mouth is known as *Dhoomapana* and is not included in *nasya*. Inhalation of *Dhuma* through mouth and exhalation through nose is prohibited in the classics as it is harmful to eye sight. *Dhooma nasya* are

1. Prayogika
2. *Snaikika*
3. *Vairechanika*.

Charaka has mentioned special *Dhoomanadi* to errhine smoke. It should be of 24 *angula* length of measuring own finger. This measurement is for *virechana* type. 32 *angula* length for *snaihika dhuma* and 36 *angula* length of *prayogika dhuma* is advocated. *Dhuma nasya* indicated in *Siro roga, netra roga* and *nasa roga*.

Marsa—Prathmarsha Nasya

Marsa and *prathimarsa nasya* both consists of introduction of oil through the nostrils. It is well tolerated and is very much easier procedure.

Prathimarsa nasya and *Marsa* are same in principle. But the main difference between them is of dose. In *prathimarsa nasya* 2 drops are given while in *marsa nasya* the dose is 6 to 10 drops.

Marsa

According to Vaghbata dropping / instillation of *sneha* in the nostrils from 6 to 10 drops is known as *Marsa*. It is gives quick result than *Prathimarsa nasya* but has more *vyapat* (complications).

Prathimars : *Prathimarsa nasya* could be given daily and even in all the seasons in morning and evening.

Summary of Procedure of Nasya

1. Before giving *Nasya*, Prior arrangement of the material and equipment should be done.

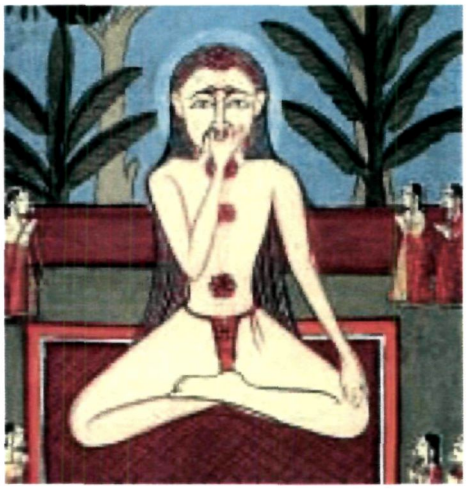
2. The patient should be examined for *yogyata* and *ayogyatha*
3. Advice the patient to pass the natural urges like urine and stool
4. *Mridhu abhyanga* (massage) should be done on scalp, forehead, face, and neck for 8 to 15 minutes
5. *Sevana* with cloth dipped in hot water may be given over *Sira, Mukha, Nasa, Manya, Griva* and *Kanta* region
6. Advice the patient to lie down in supine position with ease for nasya table
7. Head should be "*Pralambitha* (head down position approximately about 45^0 angle)
8. Then instill the luke warm medicine (adequate dose; not too cold, not too hot) in both nostrils
9. Advice the patient is to remain relaxed while taking *Nasya* Patient should avoid speech, anger, sneezing, laughing and shaking of head during *Nasya prayoga*
10. Observe the *samyk, ayoga* and *Atiyoga* Symptoms
11. After administration of *Nasya* advice the patient to lie supine for about 2 minutes. After administration of *nasya*, feet, shoulders, palms, and ears should be massaged
12. The patient should be advised to avoid swallowing of *nasya aushadhi and kaphadhi dosha*

13. The medicine instilled in the nose comes out with the morbid dosha repeatedly, especially vitiated *kapha*, advice the patient to spit out
14. Then advice to patient to take *dhuma nasya*; do the *gandoosha*
15. Patient is adviced to stay at windless place and take light meal and Luke warm water.

Practical consideration in Nasya karma.

1. Nasya should be preceded by *sodhana* or at least *Sadyovirechana* in order to get desired therapeutic actions especially in case of generalized aggravation of *dosha*
2. In *kapha -vatha dosha thaila*, in *kevala vatha dosha* vas and in *pitta dosha ghritha* or *majja sneha* should be used
3. For *pradhana Nasya* in place of *Nadi*, straw can be used
4. The *snehana nasya* should be started from 8 drops and the increase 2drops daily maximum up to 16 - 20 drops
5. Generally after *nasya karma*, *Haridra dhuma* is enough
6. In patient suffering from snoring, prathimarsa nasya should be used at bed time. Definitely patient will get improvement with in a week, but it should be continued for 3 - 6 months
7. For quicker action churna nasya should be given in case of emergency conditions such as Apasmara, Sanyasa etc.

8. Dhuma and kavala should be done after nasya
9. To get the optimum therapeutic results abhyanga, swedana and skillfull administration of nasya are highly essential
10. Pradhamana nasya is very effective in convulsive disorders
11. If the patient faints at the time of nasya, then immediately cold water should be sprinkled on forhead and face
12. Katuthaila and saindhavayukta sarpi should be used for nasyakarma especially for kshirapa.



8. PRANAYAMA

The word *pranayama* is the union of two words i.e. *'Prana'* and *'Ayama'*. *Prana* means a subtle life force, which provides energy to different organs including mind and also controls many vital life processes (eg: circulation, respiration, etc.) *Ayama* signifies the voluntary effort to control and direct this *prana*.

Breathing is one of vital activities governed by *prana* on the gross level. This is the only *pranic* activity available to us, which could be exercised voluntarily. Secondly this system of *pranic* activity is linked with

the nervous function (mental activity) on one hand and consciousness *(chitha)* on the other. Yoga has taken best advantage of this situation considering that the mind could be controlled effectively with the voluntary control over breathing which in turn could control materialistic inclinations of *chithah*.

Therefore, *Pranayama* essentially becomes a process by which *"prana"* is controlled by regulating the breathing voluntarily. Just like we have speed breakers on the road to control the flow of traffic we bring a "pause" in the breathing. So *pranayama* means a voluntary and temporary pause in the movement of breath.

Tasminsati shavasa praswasayorgati vicchedah pranayamah

(P.Y.SII 49)

Meaning to say that the pause brought in the movement of inhalation and exhalation is nothing but *pranayama*.

Patanjali has explained four types of *pranayama* (P.Y.S.II 50-51) on the basis of the nature of the pause *sthambhavrithi* - that causes a temporary suspension of breath.

1. Pause after or at the end of a prolonged *(deergha)* very slow *(manda)* exhalation *(praswasa)*
2. Pause after or at the end of deep and prolonged inhalation *(shwasa)*

3. Pause is brought at any time one wants to bring for a considerable time. It may be somewhere between usual inhalation and exhalation. This is prolongation of a break in the breathing *(sthambavrithi)*
4. The practitioners experience pause at any time without his voluntary efforts after a long practice of above three types of pauses.

In Yogic literature when the breath is held after exhalation it is called *Bahyakumbhaka*. When the breathing is stopped after inhalation it is known as *Abhyantara Kumbhaka*. While the fourth type of pause as mentioned above which comes automatically after a long practice of *pranayama* is called *Kevala Kumbhaka*.

The author of *Hathayogapradeepika* mentions eight varieties of *pranayama* (H.P II 44) not on the basis of nature of *Kumbhaka* but on the basis of nature of inhalation and exhalations, which are gone through before and after *Kumbhaka*. The techniques of all the eight *kumbhakas* are same but the technique of inhalation and exhalations before and after *kumbhaka* is different for each type of *pranayama*.

According to *Patanjali*, a slightest change brought in the normal speed of breathing *(gati vicchedah)* is *pranayama*. So prolonged inhalation and exhalation done systematically will be a *pranayama*. Obviously to do

this voluntary control is necessary. Therefore voluntary control brought on any one of the three i.e. inhalation, exhalation or the pause, on all the three will be called *pranayama*.

Characteristics of *Pranayama*

Pranayama essentially consists of a voluntary control on the breathing and probably due to this fact many people refer it to as breathing exercise. Various breathing exercises have been developed with the purpose of providing more oxygen to the system. In *pranayama* on contrary, emphasis seems to be given on the development of *kumbhaka* i.e. a controlled phase of breath holding.

Practice of *pranayama* requires a conscious control over the breathing. One remains fully aware of what he is doing during different phases of *pranayama*.

Pranayama is never done mechanically. Awareness of breathing is most important while practicing *pranayama*. *Pranayama* breathing does not produce any emotion nor it expresses any thought or desire.

Each cycle of *pranayama* is a complex voluntary act consisting of three different phases *Puraka*, *Kumbhaka* and *Rechaka*. The technique of *pranayama* includes specific rules regarding the method of breathing in terms of

1. Force of breathing

2. The duration of each phase of breathing
3. Number of rounds of *pranayama*
4. Attention on breathing.

When the force of breathing is reduced, it increases the duration of that particular phase. Tradition advocates definite proportion of time for these phases of *Pranayama*.

Important principles to be commonly observed during the practice of almost all types of *Pranayama*.

1. One has to sit in any suitable meditative asana keeping the spine in a straight and well-balanced condition. Eyes are closed gently, so that at least one major external stimulation is cut off. This helps one to pay attention to the inner happenings.
2. Inhalation for *puraka* and exhalation for *rechaka* is slow, smooth and without any haste. The flow of air is kept uniform having same force all through out i.e. in most controlled way.
3. Every *puraka* and *rechaka* must end quietly. The habit of expanding the chest or contracting the body musculature violently at the end of *puraka* and *rechaka* respectively is avoided consciously.

An attempt of snatching the air at the end of *puraka* and forcing out some more air at the end of *rechaka* would disturb the next cycle of *Pranayama*. Therefore *puraka* and *rechaka* should end pleasantly and smoothly without any strain.

4. *Rechaka* is always given longer time than *puraka*. The orthodox proportion between *puraka* and *rechaka* is 1:2. In an effort to give double time for *rechaka* one should not prolong it too much which may otherwise hasten the following *puraka*. Best way is to judge first the time for which one can prolong the *rechaka* easily and to allot just half of the time for *puraka*.
5. An orthodox practice of *pranayama* consists minimum ten rounds at a stretch at a time. Traditional texts like *Hatha-pradeepika* however recommends 80 rounds at a time and such four sittings in a day i.e. in the morning, afternoon, evening and at night. Obviously then the total cycles will be 320 / day.
6. Increase in the airway resistance is another peculiarity of *Pranayama*. Inhaling or exhaling through only right or left nostril at a time as in *anulom vilom pranayama* reduce the air passage. Naturally the volume of the air and the volume of blood reaching the lungs will be different as the ventilation is approximately reduced to 50%.

Aims and objectives of *Pranayama*

Any activity, which requires a total concentration of our mind, will also control our breath, which may even be stopped for a while. e.g: while threading needle our breathing is stopped for a few minutes. This shows clearly that there is a correlation between our mind and breathing, a *pranic* activity. The emotions and mental activities are related to nervous system and through it they change our breathing. This means that if we try to manipulate our breathing voluntarily, we can tackle the life force which is deeply connected with mind (nervous activity) and therefore with the emotions.

Pranayama aims primarily at the control on the mind. When the mind is standstill no thought processes or emotional disturbance is possible. Thus by controlling the mind we would be able to control different emotions and as a result the temperament, moods, desires and natural instincts of *vrittis* (mind) are controlled automatically.

By practicing *pranayama* the ability to perceive the reality is intensified. The mind is trained and made capable of the process of *dharana*. Since the mind

becomes steady and peaceful after the practice of *Pranayama*, it becomes suitable and capable to concentrate on one subject at a time.

Different *nadis* are also purified with the practice of *Pranayama*. This is known as *nadisuddhi*. *Nadis* in Yoga are the channels or the passages for the transmission of nerve impulse or the conduction of the *pranic* activity for the circulation of the blood or lymph or even for the flow of air through them Most important *nadi*, which opens after the long practice of pranayama, is *sushumna*. *Pranayama* eliminates all types of *malas* from the body and the mind. *Mala* in Yoga is that toxic factor which gives rise to an imbalance in the body and mind by obstructing or blocking the normal functions of *nadis*.

During *Pranayama* the breathing is consciously made even deep and rhythmic. This will bring about noticeable relaxation, tranquility, and balance sense of well being to the mind. In this situation one's egoconsciousness, which is the seat of the instincts and desires, cannot interfere with mind as usual. When ego is controlled the behavioral pattern can also change.

Thus the practice of *Pranayama* contributes in transforming the total personality. This helps one in controlling his non-Yogic tendencies, instincts and urges arising in his mind *(chittah vritti nirodhah)*.

In recent years scientists have admitted the role of psyche in so

called somatic diseases and the term psychosomatic diseases is given to such diseases, where the cause is not the infection but the psychic tension and disturbance. *Hathayoga* claims to cure all these diseases when *Pranayama* is practiced properly. It also warns that if *Pranayama* is not practiced judiciously then many diseases may arise e.g.: asthma, hiccough, pain in the head, ear and eyes etc. It seems possible since the breathing is associated with the autonomic nervous system and autonomic nervous system on the other hand with mental and emotional reaction. By judicious practice of *pranayama* one attains sound health, steady and peaceful mind, slim and lustrous body (H.P.II.16-18).

Different time ratios

In order to maintain uniformity and rythmicity in all round or cycles of *pranayama,* and to allow one to practice within his limitations, different time proportions are followed during the practice. Such time ratios provide best proportion and the combination of *puraka, kumbhaka* and *rechaka* phases as far as their duration is concerned.

The purpose behind this seems to

1. Provide one, some means to measure one's own capacity so that one may not transgress and over step ones own limitations and wreck the delicate and vital mechanisms of respiration.
2. Stimulate the Autonomic Nervous system and other breathing reflexes in most rhythmic regular and systematic manner

so as to condition them for higher spiritual forces and render them tough against day-to-day stress and tensions.

The most favored view is to have the proportion of 1:4:2 for *puraka, kumbhaka* and *rechaka* respectively. Of course it is hard to reach this ratio in the beginning.

According to this ratio if *puraka* is done for 5 seconds, *kumbhaka* should be of 20 seconds, and *rechaka* to be prolonged for 10 seconds.

Another tradition *(Goraksha Samhitha)* (Ch. I4) suggest *matras* in the ratio of 6:8:5 for safe and convenient practice of *pranayama*. To start with one can start from 1:1:2 and then to introduce gradually the ratio 1:2:2 and so on. A feeling of distress or air hunger at any stage indicates some strain in following the proportion. One has to reduce the time for *puraka* in case so that other phases are also reduced in their duration and then whole practice is easier. The phase of *kumbhaka* should be introduced just in the form of a small pause between *puraka* and *rechak*a and then its duration may be increased gradually and cautiously.

Mechanism of *Pranayama*

Puraka Phase

Shwas, is the natural involuntary process of inspiration regulated by the respiratory center in medulla oblongata. *Puraka* is the voluntary prolongation of the inspiratory phase. It is well controlled in terms of

time, force, ventilation and depth as per the proportion. Inhalation in *puraka* is done in a very smooth way by keeping the force uniform. The speed at which the lungs are filled is thus regulated. When we increase the duration and prolong the phase of inhalation the force is automatically decreased.

In *bhastrika pranayama* however one breathes inward out very rapidly, giving just half a second for one cycle, consisting of *puraka* and *rechaka* of the first part of *bhastrika* (120 cycles/minute) . In *lom-vilom* and *suryabhedan pranayama puraka* is done only through right or left nostril at a time. In *ujjayi* and *bhramari pranayama* controlling glottis and throat muscles reduces the ventilation. Thus the mechanism of inspiration is modified voluntarily during *puraka.*

During the phase of *puraka,* the lungs are expanded considerably and the walls of alveoli are stretched maximum. As we continue the phase of inhalation with our strong voluntary control the normal stretch reflex is inhibited and therefore no exhalation is possible. The chest continues to get expanded under cortical control. The stretch receptors are thus trained to withstand more and more stretching. This helps us to hold the breath for a long time easily.

As we continue to inhale the intrapulmonary pressure is also raised. The diaphragm does not move freely as the abdomen is kept slightly inward and controlled. Therefore, the alveoli in the upper pulmonary part

are filled with air. One uses his inspiratory capacity for prolonged phase of *puraka*. This has a beneficial effect on the gaseous exchange which then takes place efficiently through out the day.

Normally we finish our inhalation in 1.5 to 2 seconds during which the exchange of gases is almost completed. Now although the need of oxygen is very less we are prolonging our inhalation from 2 to 5 seconds. Instead of usual 500 ml of air we are now breathing in 1 to 1.5 liters of air and the volume of blood reaching the lungs is also more. The exchange of O_2 and CO_2 is very effective.

Kumbhaka phase

Here only *antark umbhaka* is considered. *Kumbhaka* is the voluntarily controlled suspension of breath. After the particular stage in *puraka* as per the ratio is observed one stops inhalation and retains the inspired air in the lungs for the proportionate time. The intrapulmonary pressure (in alveoli), which is raised to one's optimum capacity, is maintained during the *kumbhaka* stage. The alveoli and bronchioles are stretched to their optimum level. The stretch receptors however cannot bring about the reflex contraction of the lungs and the respiratory muscles cannot relax as they do normally due to strong cortical control.

The ideal duration of *kumbhaka*, is that which would enable one to give double time for *rechaka* than that of *puraka*. The duration of

kumbhaka is gradually increased over a long practice of *pranayama* so that the respiratory center is gradually acclimatized and trained to withstand higher and higher and higher CO_2 concentrations in the alveoli and blood.

The metabolic processes continuously produce CO_2, which is picked up by the blood under normal respiration and is promptly thrown out of the body. But now when we retain the breath of a considerable time, the CO_2 level (concentration) is going to increase in the blood.

Obviously the exchange of O_2 and CO_2 across the thin walls of alveoli and blood capillaries would take place more efficiently as they get more time. However the exchange of gases will not be possible after a particular stage when there is a starvation of the gases on both the sides. i.e. in the alveoli and in the blood.

The chemoreceptors located in medulla oblongata near the entry of the IX and X cranial nerves are sensitive to amount of CO_2 in the blood.

The increasing concentration of CO_2 in the blood stimulates these chemoreceptors, which in turn send the impulses to the respiratory center. The respiratory center, which would have otherwise started exhalation, is now helpless against the strong voluntary control from the cortex. So in a way we are training these chemoreceptors to tolerate more and more tension of CO_2 during *kumbhaka*.

After some stage in *antarkumbhaka* an inner urge to exhale arises for the first time, which is generally neglected by our volition. The second inner urge to exhale is still stronger than the first one, which also is sometimes ignored. The third and the strongest desire however arise which usually one cannot and should not neglect. Now *rechaka* should be started without any delay. This way without crossing the limits one can increase capacity to perform *kumbhaka* for longer durations.

The peripheral chemoreceptors, which are sensitive to lowered O_2 level in the blood, would also send powerful stimulation to the respiratory center to start exhalation. As the CO_2 goes on accumulating during kumbhaka, the chemoreceptors report of promptly to pneumotoxic center which in turn tries to stimulate expiratory center the autonomic or the reflex mechanism of respiration is fortunately far more powerful than the control from the higher centers. That is why after a particular stage it is not possible to hold the breath further. The receptors will however get acclimatized to the increasing concentrations of CO_2 gradually by regular practice.

Rechaka phase

After retaining breath for sufficient length of time as per the time ratio in a comfortable manner, then *rechaka* is started. *Rechaka* is a voluntarily controlled exhalation as compared to the normal exhalation *(praswasa)* . The control as in *puraka* is brought in terms of time, force,

ventilation and flow of air In order to increase the duration of *rechaka* as per the time ratio the exhalatory force is reduced and the limited air is allowed to escape. For this purpose, exhalation is carried out through the right or left nostril only or through both the nostrils by contracting the glottis partially at the same time. Thus creating slight airway resistance regulates the volume of the air to be expelled out per unit of time. This helps in prolonging the exhalation and to reduce the force of air going out. In *rechaka* one uses his expiratory reserve volumes for exhaling completely before starting next *puraka*.

Now the intra pulmonic pressure is slowly reduced and the alveoli are also gradually deflated. By this time when one is exhaling slowly, the percentage of CO_2 is still increasing in the blood and the chemoreceptors in the medulla are trying to inhibit exhalation and to start inhalation by stimulating the inspiratory center.

Similarly the peripheral chemoreceptors are also trying to bring about reflex inspiration, as they are sensitive to the lowered O_2 concentration in the blood.

But both the reflexes are controlled by one strong volition and we continue to breathe out. The purpose seems to acclimatize these receptors to higher CO_2 tensions in the blood as stated above in *kumbhaka*.

It may be noted that CO_2 has got a cooling effect on the nervous system up to certain limits and has been found to reduce anxiety when administered in the form of a mixture containing 65% CO_2 and 35% O_2. This would help mind to undergo meditation state.

The duration of *rechaka* is however so adjusted that there is no feeling of 'air hunger' of any stage. If it is not well adjusted in proportion the following *puraka* is hurried and the whole proportion of *pranayama* cycle is disturbed.

Significance of double timeproportion for *Rechaka*

One is supposed to follow 1:2 ratios for the duration of *puraka* and *rechaka*. Even when *kumbhaka* is given four times more duration in 1:4: 2-time ratio, rechecks is given double time than *puraka*. Really speaking *puraka* is the true measure as other phases depend on for the proportion. *Puraka* is to be adjusted so as to give double proportion to *rechaka*. This is possible after knowing one's capacity to prolong the phase of exhalation. For example, if one is able to breathe out for only 8 seconds comfortably he should adjust his *puraka* for only 4 seconds.

Rechaka is the significance of double duration on the basis of psychophysiological principles.

1. Normally, the instinct of inhalation is always stronger than that of exhalation. This is due to increase in CO_2 tension in

the blood at the end of normal expiration. When we prolong the phase of exhalation we tackle this chemorecepter reflex and discard the urge of inspiration. Prolonged duration of *rechaka* facilitates such training of chemoreceptors to with stand more and more concentrations of CO_2 in the blood. This is actually a preparation for *keval kumbaka* to happen one day, which is nothing but an amount of respiration in the mid stage during or in between the inhalation and exhalation for some time.

2. It. is our common experience that we feel relaxed whenever we exhale deeply and smoothly. The experiments have shown that various tensions as well as anxiety are reduced during the prolonged exhalations. Prolonged *rechaka* would then liberate more psycho physiological tensions and one would feel calm and quiet. The degree of physiological arousal is responsible for any emotion to occur. Prolonged exhalation gives rise to the parasympathetic tone in the body and reduces the level of excitations and therefore one feels relaxed and peaceful.

3. In order to observe a particular time ratio in each cycle of pranayama a total concentration is necessary. When rechaka is prolongedsmoothly we remain aware of the force flow of air and the time thus keeping the mind away from

(perception of) external stimulations and the thought processes for a maximum time.

4. Increased duration of *rechaka* makes the exhalation most complete. As one is using his expiratory reserve volume the air containing maximum percentage of CO_2 is completely squeezed out of lungs (except dead space volume and residual volume). When we inhale for *puraka* of the next cycle of pranayama we get maximum quantity of a fresh air equivalent to 75% of our vital capacity. This offers better scope for effective gaseous exchange. If *rechaka* phase is not sufficiently prolonged some amount of air remains in the alveoli at the end of incomplete exhalation.

Volume of air, which contains accumulated CO_2, would be mixed with incoming fresh air and the amount of O_2 reaching the alveoli will be less in every cycle. One may not be able to keep proper ratio of time, as he feels suffocated after a few rounds. There fore double proportion of *rechaka* seems to be appropriate.

Conclusion

In short, during the practice of *pranayama* we tackle all the respiratory reflexes on account of volitional control on the respiration. The impulses from both the CNS and ANS are better integrated due to

rhythmic and proportionate stimulation of the propriocepters and visceroceptors as well as the vagus nerve.

The emotions are positively influenced due to this rhythmic and smooth breathing pattern adopted every day. Like emotions, mental activities are also related with breathing. As the mind is engaged fully in breathing unnecessary thought processes are checked. As the cognitive intellectual and the ego based analytical processes of the mind are minimal or even absent the mind becomes more balanced which enables us to experience higher levels of consciousness or to get into the meditational state as the power of concentration also increases.

Pranayama has not been developed to supply oxygen. It is meant for controlling and balancing Autonomic nervous system and influences other autonomic functions as well.

Anulom Vilom Pranayama

This *pranayama* is also known as *Lom-Vilom, Nadi shodana or Nadi Suddhi pranayama.* The main characteristic feature of this pranayama is the alternate breathing through

the left and the right nostril with or without *kumbaka*. Many of us may not be aware of the fact that we breathe mostly through only one nostril at a time and even the force of breathing is also not equal for both the nostrils. *Swara yoga*, the science of breath claims that there is a natural rhythmic and alternate change in the dominance of one nostril to that of the other occurring every one-hour. It also believes that a particular type of nostril dominance is preferable for preparing one mentally emotionally and physiologically for a particular activity in the day life style. This is because certain physical activities and physiological conditions were observed to be associated with a predominant flow through a particular nostril.

Right nostril dominance is supposed to be associated with the digestion of food, outward directedness, more vigorous activity, more active, and aggressive nature and more alertness for the external happenings. Where as left nostril dominance is related to more passive psychological state more quiet and receptive mood, which helps one in getting easily directed towards the inner environment.

Yoga, not only recognized this uninostril dominance from the beginning but also has correlated certain psychological changes and behavioral tendencies with uninostril dominance.

Modern science has revealed several chronic functional disorders ranging from simple intellectual asthenia to visceral dysfunctions like asthma,

peptic ulcer, cerebral palsy, dysmenorrhoea etc associated with permanent single nostril dominance on account of the septal deviation or some other obstruction in the nostril. Various mental and emotional disturbances have been observed to influence the natural rhythm of the alternate nostril dominance by changing nasal congestion and secretions. Physical factors like temperature, humidity, irritants, breath holding as well as exercise are known to alter nasal airflow, although this would bring about the changes in both the nostrils equally.

Physiologically our body tries to adjust itself with the environmental temperature changes through alternate vasodilatation and vasoconstriction mechanism. It is an autonomic function. As there are many cyclic, changes in the external environment like day and night cycle, various body activities are governed by cyclic functions of the autonomic nervous system. One such periodic function is "nasal cycle" i.e. regular alternation in nasal congestion from one nostril to the other thereby shifting the nasal airflow resistance from right to left and left to right nostril several times a day.

Engorgement of erectile tissue due to vasodilatation causes congestion and produces resistance to the airflow in that nostril. At the same time blood flow to the other nostril is reduced due to vasoconstriction of the blood capillaries, the erectile tissue shrinks and thus the airflow resistance is decreased in this nostril.

The volume of air passing through this nostril is increased. This is rhythmic alteration of degree pf congestion of the mucosal membrane of each nostril. If the left nostril is less congested and offers less resistance to the airflow, that means a greater air volume is flowing through the left nostril and hence this condition is referred to as "left nostril dominance".

Both sympathetic and parasympathetic efferent nerves of autonomic nervous system innervate the nose. The sympathetic stimulation causes vasoconstriction and thereby decongestion of the nostril which increases the airflow through that nostril. At the same time the parasympathetic action results in the increased blood flow (vasodilatation) to the erectile tissue in the other nostril and bring about congestion thereby blocking the nostril. Thus a rhythmic shift in autonomic nervous system tone is responsible for alternate nostril dominance. There is no wonder then, If the emotional and psychological states are found to affect and disturb this natural rhythmic function, since the emotions and tensions are related with the ANS and its centers in the limbic portion of brain.

It has been found that nasal cycle exists in about 85% people in the form of left or the right nostril dominance remaining 15% people will show either equal partial blockage or equal wide opening of both the nostrils. This may be for a short time when one nostril is opening the other is getting blocked at the same time.

It has been observed that the human performance also depends on the particular nostril. The endocrine function has been demonstrated to be related to the change in the nostril dominance. The cerebral hemispheric activity of one side as judged by EEG technique was also found to be correlated with the nostril dominance on the contra lateral side.

In short, our ancient yogis knew the fact that the nasal cycle is the only medium in our hand to control and balance the autonomic functions of the body. The balanced function on all the levels of the nervous system is essential for the maintenance of a good health.

Yoga believes that left nostril breathing dissipates more heat from the body or in other words it has a cooling and calming effect on the body. Left nostril is known as *"Idanadi"* or *"Chandranadi"*. *Idanadi* represents the constructive anabolic or energy conservation aspect of the *pranic* function. The right nostril is known as *"Pingala nadi"* or *"Suryanadi"*. It has got healing and activating and strengthening effect on the body. It represents destructive catabolic or energy consuming aspect of the body.

The main purpose of *anulom-vilom pranayama* is to purify the principal channels of energy *(nadis)* within the body. It is believed that because of the irregular schedules of meals, sleep, stress, pollution, infections and other disrupting forces the *nadis* are filled with impurities or the toxic substances *(malas)* and are there fore blocked. The flow of *prana* may be obstructed.

Gherand samhitha advocates that one should perform the alternate nostril breathing before the main *pranayama* as it will cleanse these *nadis* (Gh.S.Ch.V.38-43,53) *Hatha pradeepika* (HP.Ch.II-7-10) gives a detailed technique of this *pranayama*, in order to remove different *malas* from the body and the mind when both the *nadis* work evenly and simultaneously the third *nadi* starts functioning. This *nadi* is known as *sushumna nadi*. *Prana* is supposed to travel through this *nadi* during pranayama. For this purpose it is necessary to purity all these *nadis* with the help of *Anulom-Vilom pranayama*. So that vital force would folw through them and establishes a control over the mind. This cleansing of the *nadis* may be accomplished in three months or even earlier according to *hathayoga*.

Technique of *Anulom-Vilom Pranayama*

1. One sits comfortably in *padmasana* or in any suitable meditative asana.
2. Spine is maintained in a balanced and straight position and the abdomen is controlled after moving it slightly inward.
3. After this one forms a special *mudra* of the right palm by folding and supporting the index and middle finger together at the bottom of the thumb. The ring finger and small finger are used for closing left nostril. The right nostril is closed with the help of the thumb.
4. One inhales slowly and deeply through the left nostril. The

force and flow of the breath is kept uniform till the inhalation is complete. This is *puraka* phase.

5. At the end of *puraka* the left nostril is immediately closed with the help of ring finger and little finger since the right nostril was already closed before *puraka* now both the nostrils are closed. Breath is retained according to one's capacity. This is *kumbhaka* phase when there is moderately strong desire to release the breath one opens the right nostril just by removing the thumb from it and starts exhaling slowly and smoothly through the right nostril. This is *rechaka* phase. Now the next *puraka* is done through the right nostril. After doing *kumbhaka* as before the *rechaka* is performed through the left nostril. This is considered as I round of *nadi suddhi*.

Such 3, 7, 10 or even more rounds are gone through at a stretch. Puraka phase is long, slow and *manda*. While *rechaka* phase is more prolonged and slower in nature. This helps to maintain a ratio of 1:2:2 or 1:4:2 for *puraka kumbhaka* and *rechaka*. Breathing is however very smooth and without any frictional sound.

Left nostril Right nostril

1. *Puraka*	2. *Kumbhaka*
3. *Rechaka*	4. *Puraka*
5. *Kumbhaka*	6. *Rechaka*

Since the breathing is done through only one nostril at a time during *puraka* and *rechaka*, the minute ventilation is reduced. Another reason for this is the controlled prolongation of both the phases as per ratio. The amount of air reaching the lungs is restricted while the volume of blood being circulated in the lungs remains unchanged. That is, the ratio between the air and blood volume in the lungs is altered. The gaseous exchange therefore takes place more efficiently.

The awareness is directed towards breathing process, which reduces the perception of the disturbing sensory inputs from the external environment. This helps one to become more sensitive to and conscious of the flow of the air in the beginning and later on of the inner happenings. This will also restore the natural regular rhythm and balance in the nasal cycle phenomenon.

Nostrils are supplied with both sympathetic and parasympathetic branches of autonomic nervous system, which are also related with other autonomic functions of the body as well as the opposite forces working with mental, emotional and psychological activities of the individual. It is also related to right and left hemispheric activity and the autonomic control on the endocrinal functions.

During the practice of this *pranayama* the cortical activity in relation with the intellect analysis, ego, consciousness and the thought processes is greatly reduced to a minimal.

It therefore appears that the rhythmic and proportionate as well as consciously controlled breathing through two nostrils alternately, brings about a harmony in the two oppositely working neural activities and establishes the balance in them.

It brings tranquility and peace to the mind making it more balanced and stable. The soothing effect of this *Pranayama* on the nervous system reduces various emotional tensions and one feels relaxed and light. This will have a bearing upon the emotional behaviour of the individual if one practices it for a long period. Calmness and mental relaxation are easily felt immediately after the practice of *Pranayama*, this *Pranayama* has also been reported to improve the function of digestion and sleep.

Thus *anulom vilom pranayama* is conducive to the development of proper inner awareness that will help one to perceive special sensory inputs from the interoceptors in the spinal area starting from the sacral region in higher practices. It purifies (sets right or corrects) all the neural functions and therefore it is essentially practiced before other *Pranayamas*.

Seetkari Pranayama

In *Seetkari Pranayama* the sound "see" or "seet" is made during inhalation. The Sanskrit word *"kari"* means that which produces. The practice produces the sound "see" and it also produces coolness.

Technique

1. Sit in a comfortable meditative posture with an erect spine. Exhale from both the nostrils.
2. Fold the tongue backwards and press the tip of the tongue by the hard palate leaving narrow openings on either side of the tongue. Inhale through these side openings making a hissing sound
3. Allow the breath to be stopped with ease.
4. Exhale slowly and continuously through both the nostrils.
5. Then allow the breath to stop with ease and release.

This *Pranayama* has a cooling effect. When the air enters through the mouth, it cools the tongue and lowers the temperature of the blood leaving the lungs and thus of the whole body. Heat produced in the lower energy centers particularly those connected to the reproductive and excretory organs are reduced. *Seetkari* established harmony in the endocrine system and regulates the hormonal secretions of the reproductive organs. When the breath is taken in through the mouth the nerves in the nose, which register the moisture, temperature, ions etc. in the air are not stimulated, though of course the ions and air are nevertheless absorbed into body.

Seetkari makes a person virile and attractive. Passion is the form of heat in the body and mind, which in sensual life is expressed and discharged in the natural way. This results in an energy loss. Through

Seetkari pranayama the mental and emotional inflammation of passion is reduced. *Seetkari* particularly works on the heat/cold aspect of the body. Control of any two opposite forces in the body/mind leads to control of other aspects of the physical, mental emotional and psychic makeup.

Seetkari eliminates indolence and the need and desire to eat drink and sleep. Through the practice of *seetkari pranayama* the body and mind can both be brought into a state of harmony and thereafter will become the dominating quality.

Sheetali Pranayama

Sheetali means the "cooling breath" and it also means calm, passionless, unemotional. This practice not only cools and calms the physical body, but also affects the mind in the same way.

Technique

1. Sit in any comfortable meditative posture with an erect spine. Exhale from both the nostrils.
2. Fold up the sides of the partially protruded tongue, so as to form a long narrow tube resembling the beak of a bird. Pressing the lips round the tongue further narrows the passage. Inhale, making a hissing noise and perceive the cooling effect of the air as it passes through the tongue.
3. Allow the breath to be stopped effortlessly. Exhale through both nostrils.

4. Then allow the breath to be held comfortably before the next inhalation The benefits of *sheetali* and *sheetkari* are basically the same. These two practices are unique because inhalation is done through mouth. When you breathe through the teeth or tongue the air is cooled by the saliva and this cools the blood vessels in the mouth throat and lungs. In turn the stomach liver and whole body are cooled. Because *sheetali* and *sheetkari* sooth away mental tension, they are useful techniques for alleviating psychosomatic diseases. They also purify the blood and improve digestion.

There is only slight difference between *seetkari* and *sheetali*. In *seetkari* awareness is focused on the hissing sound, and in *sheetali* it is kept on the cooling sensation of the breath. There are also minor differences, which affect different part of the nervous system but ultimately, the impulses are sent to the central nervous system and brain.

Bhramari Pranayama

Bhramari "the humming bee' *Pranayama* is so called, because the sound made during respiration imitates that of a black bee

Technique

1. Sit erect in *Padmasana*
2. Breathe in through both the nostrils in such a way that a

fine sound like the one produced by the male bee is heard.

3. Allow the breath to stop effortlessly.
4. Slowly exhale while producing a sound from the mouth and nose, so as to produce a sweet, musical humming sound like a female bee.
5. Hold the breath.
6. Slowly release.

Bhramari helps to awaken psychic sensitivity and awareness of subtle vibrations. The sound produced in *bhramari* is very soothing and thus the practice relieves mental tension and anxiety and helps in reducing the anger.

Chandranulom Pranayama

In *Hathayoga* literature *surya* means right and *chandra* means left. Here the inhalation and exhalation are through left nostril *(chandra nadi)* only. Right nostril is kept closed all the time.

Technique

1. Sit erect in *padmasana* or *vajrasana* with head, trunk and

spine in a straight line. Close your eyes and exhale completely.

2. Inhale through left nostril slowly and steadily without making any sound.
3. Exhale slowly, continuously and silently.
4. Have inhalation and exhalation for the same duration. During exhalation the chest goes down and the abdomen is taken in. Both the chest and abdomen expand during inhalation rhythmically.
5. There is no holding of the breath.
6. One can have about 10 to 15 rounds to start with and can go up to 30 rounds.
7. One inhalation and one exhalation means one round.
8. One must practice at least 3 months to perceive the benefits.
9. The whole practice is to be done in a very relaxed manner with least exhaustion.

Part – II
Drug Review

A wide variations of formulated medicine i e. "YOGAS" are described in Ayurveda to treat the various salakya diseases, including the "Ardhavabedhaka". But unfortunately now-a-days most of them are not widely practiced by the Ayurvedic doctors. A study of these Yogas is necessary to propagate the glory of Ayurveda in the field of salakya i.e. diseases of the Ear, Nose, Throat and Eye. However in this study thrust is given on detailed study of pathyashadangam yoga. Prior to clinical study this is highly essential.

Pathyashadanga

Pathyashadangam is an important Ayurvedic formula commonly used by the traditional physicians in Kerala. This Oshadha yoga is mentioned in Sarangadhara samhitha, shalakyathantra . For centuries, this drug is very popular among the practicing vaidyas especially in northern Kerala. This traditional drug is very easy to prepare. Ingredients are very cheap and easily available.

Ingredients

The ingredients of the pathyashadangam are the following:

Sanskrit	Malayalam	Botanical Name
Pathya	Kadukka	Terminalia chebula Retz.
Aksha	Thannikka	Terminalia bellarica (Gaertn) Roxb.
Dhatri	Nellikka	Phyllanthus emblica Linn.
Bhoonimba	Kiriyatha	Andrographis panniculata (Burm.f.) Wall. ex nees
Nisa	Manjal	Curcuma longa Linn.
Nimba	Veppu	Azadirachta India A.Juss
Amritha	Chittamruth	Tinospora cordifolia (Wild.)

Pathyashadangam consists of seven drugs inclusive of pathya, hence pathyashadanga.

This medicinal compound can be used either as decoction or as nasya or even as oil to be applied on the head . No known study has yet been carried out in a scientific manner at doctoral level on this drug. Global giants in drug markets are spending millions every year to find suitable remedy for this distressing problem, but the drug selected for this study contains only simple inexpensive non- toxic herbs, which are available freely.

1. Terminalia chebula Retz.

Family	:	Combretaceae (Hareethaki kulam)
English	:	Chebulic myrobalan
Malayalam	:	Kadukka
Sanskrit	:	Pathya, Hareethaki, Abhaya

Properties and uses : The fruits are, astringent, sweet, acrid, bitter, sour, thermogenic, anodyne, anti inflammatory, vulnerary, alternate, stomachic, laxative, purgative, carminative, digestive, anthelmintic, cardio tonic, aphrodisiac, antiseptic, diuretic, febrifuge, depurative and tonic.

They are useful in vitiated conditions of tridhosha, wounds, ulcers, inflammations, gastropathy, anorexia, helminthiasis, flatulence, hemorrhoids, jaundice, renal calculi, hemi crania, epilepsy, various eye diseases, skin diseases, leprosy, intermittent fever, cardiac disorders, stomatitis, neurological diseases and general debility.

2. Terminalia bellerica (Gaertn) Roxb.

Family : Combretaceae (Hareethaki kulam)

English : Belleric myrobalan

Malayalam : Thannikka

Sanskrit : Aksha, Vibheetaki

Distribution : Through out India, in deciduous forest

Parts used : Bark, fruits

Properties and uses : The bark is mildly diuretic and is useful in anemia and leucoderma. The fruits are astringent, sweet, acrid, thermogenic, anti inflammatory, anodyne, styptic, narcotic, digestive, anthelmintic, rejuvenating. They are useful in vitiated conditions of kapha and vata, cough, bronchitis, pharyngitis, insomnia, dropsy, dyspepsia, flatulence, spleen enlargement, hemicrania, various eye diseases, strangury and general debility. The mature and dry fruit is constipating and is

useful in diarrhoea and dysentery. The oil obtained from the seeds is trichogenous and is useful in dyspepsia, skin diseases, leucoderma and grayness of hair.

The plant : A large deciduous buttressed tree 20-30m in height with thick alternate, long petiole leaves crowded about the extremities of the branches, broadly elliptic, margins entire, main nerves 6-8 pairs, midrib prominent on both surfaces, flowers pale greenish yellow with an offensive odor, in auxiliary spikes, longer than the petioles but obscurely 5 angled, narrowed into a very short stalk.

A moderate sized to large (large in good soil, and moderate in rocky places) deciduous tree with a cylindrical bole, rounded crown and spreading branches; leaves ovate, elliptic or obovate, glabrous to tawny - villous beneath with a pair of large glands at the top of the petiole, flowers yellowish white in terminal simple spikes or short panicles; fruits glabrous, shining ellipsoidal, obovoid, yellow to orange brown

in color, faintly angled, up to 3. 75 cm long; seeds hard, pale yellow.

Parts used : Mature and immature fruits.

3. Phyllanthus emblica Linn.

Family : Euphhorbiaceae (Eranda kulam)

English : Emblic myrobalan

Malayalam : Nellikka

Sanskrit : Amalaki, Dhatri

Distribution : Throughout India, in deciduous forests and on hill slopes up to 200m, also cultivated in plains.

Parts used : Root bark, bark, leaves and fruits.

Properties and uses : The root bark is astringent, and is useful in ulcerative stomatitis and gastrohelcosis. The bark is useful in gonorrhea, jaundice, diarrhoea and myalgia. The leaves are useful in conjunctivitis, inflammation, dyspepsia and dysentery. The fruits are sour astringent, bitter, acrid, sweet, cooling, anodyne, carminative, digestive, stomachic, laxative, alterant, alexeteric, aphrodisiac, diuretic, antipyretic, tonic and trichogenous. They are useful in vitiated condition of tridhosha, diabetes, cough, asthma, bronchitis, hemicrania, various eye diseases, dyspepsia, colic, flatulence, hyperacidity , peptic ulcer, erysipelas, skin diseases, leprosy, haematemesis, inflammations, anaemia, emaciation, hepatopathy, jaundice, strangury, diarrhoea, dysentery, haemorrhages, leucorrhoea, menorrhagia, cardiac disorder, intermittent fevers and greyness of hair.

4. Andrographis paniculata (Burm.f.) Wall.ex nees

Family : Acanthaceae (vasa-kulam)

English : Green chiretta, Kalamegh

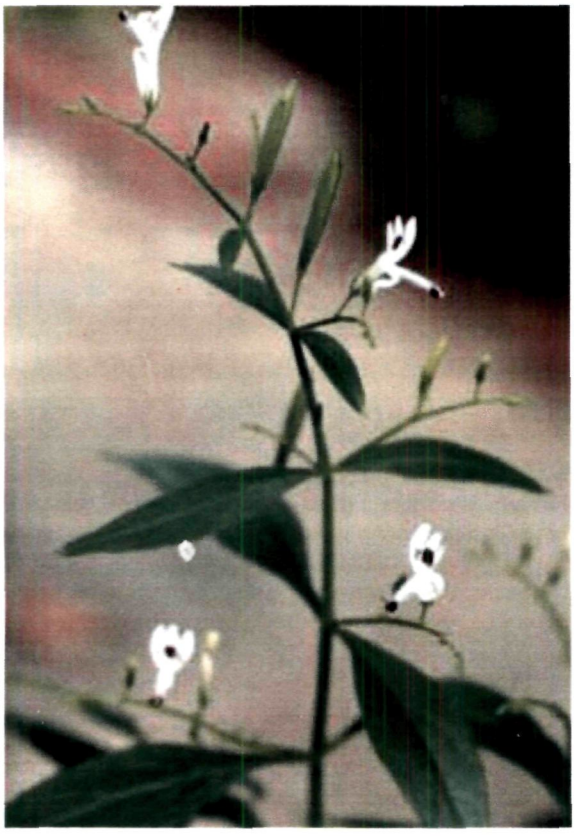
Malayalam : Kiriyatha.

Sanskrit : Bhoonimba, kiratathiktha

Distribution : Through out India, in the plains, also in forests as under growth.

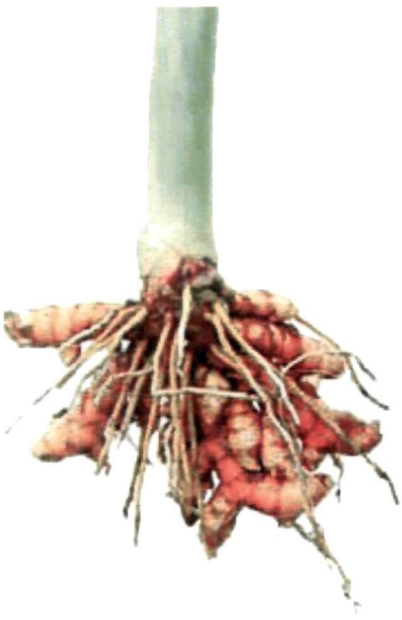
Parts used : whole plant

Properties and uses : The plant is bitter, acid, cooling, laxative, vulnerary, antipyretic, anti-periodic, depurative, sudorific, anthelmintic, digestive and expectorant. It is useful in ulcers, hyperdipsia, burning sensation, wounds, chronic fever, malarial and intermittent fevers, inflamm-ations, cough, bronchitis, skin diseases, leprosy, pruritis, dyspepsia, intestinal worms, flatulence, colic, diarrheoea, dysentery, haemorrhoids and vitiated condition of pitha.



5. Curcuma longa Linn.

Family	:	Zingiberaceae (Ardraka kulam)
English	:	Turmeric
Malayalam	:	Manjal
Sanskrit	:	Haridra, varavarnini
Distribution	:	Through out India, cultivated
The plant	:	A perennial herb, 60-90 cms. in height, with a short stem and tufts of erect leaves, rhizome cylindric, ovoid, orange coloured and branched leaves simple, very large, petiole as a thin blade, oblong, lancolate, tapering to the base up to 45 cm long flowers pale



yellow in spikes concealed by the sheathing petioles, flowering bracts pale green.

Parts used : Rhizomes (dried as well as raw)

Properties and uses : The rhizomes are bitter, acrid, thermogenic, emollient, anodyne, anti inflammatory, vulnerary, depurative, antiseptic, appetizer, carminative, stomachic, anthelmintic, laxative, diuretic, expectorant, haematinic, styptic, antiperiodic, alterative, alexaeteric, detergent, stimulent, febrifuge, ophthalmic and tonic, and are useful in vitiated conditions of kapha and pitha, inflammations, ulcers, wounds, leprosy, skin diseases, pruritis, allergic conditions as discolouration of the skin, anorexia, dyspepsia, flatulence, colic, helminthiasis, constipation, strangury, cough, asthama. bronchitis, hepatmegaly, splenomegaly, fever, giddiness, urethrorrhea, elephantiasis, dropsy, hysteria, epilepsy, chronic otorrhoea, ringworm, gonorrhoea, amenorrhoea, jaundice, conjunctivitis and general debility.

6. Azadirachta indica A.Juss.

Family	:	Meliaceae (Nimba kulam)
English	:	Neem, Margosa
Malayalam	:	Veppu, Aruveppu, Arya veppu
Sanskrit	:	Nimbah, Prabhadra.
Distribution	:	Through out India, in deciduous forest, also widely cultivated.
Parts used	:	Bark, leaves, flowers, seed, oil
Properties and uses	:	The bark is bitter, astrigent, acrid, refrigerant, depurative, antiperiodic, vulnerary, demulcent, insecticidal, liver tonic, expectorant, urinary astrigent, anthelmintic, pectoral and tonic . It is useful in vitiated conditions of pitha, hyperdipsia, leprosy, skindiseases, eczema, leucoderma, pruritis, intermittent and malarial fevers, wounds, ulcers, burning sensation, tumour, tubercular

glands, anorexia, vomiting, dyspepsia, intestinal worms, hepatopahy, cough, bronchitis, urorrhoea, diabetes, inflammation, amenorrhoea, lumbago, haemorrhoids, otalgia, syphilis and fatigue.

The leaves are bitter, astringent, acrid, depurative, insecticidal, demulcent and refrigerant. They are useful in vitiated conditions of pitha, burning sensation, leucoderma dyspepsia ulcers, intermittent and malarial fevers, skin diseases, various eye diseases, intestinal worms, and pruritis.

7. Tinospora cordifolia (Willd.)

Family	:	Menispermaceae
English	:	Gulanca, tinospora, Tinospora
Malayalam	:	Chittamrith
Sanskrit	:	Guloochi
Distribution	:	through out India in forest
The plant	:	A large extensively spreading glabrous, perennial deciduous twiner with succulent stems and papery bark.

Leaves	:	Simple, alternate, coordinate, entire, glabrous, 7-9 nerved
Flowers	:	Yellow, in lax racemes, arising from nodes on the old wood, male flower in clusters, female flowers usually solitary
Fruits	:	Red when ripe. The surface of the stems appears to be closely studded with warty tubercles and the surface skin is longitudinally fissured. On removal of the surface skin the dark greenish mucilaginous stem is seen.

Parts used : Stem.

Properties and uses : The stem is bitter, astringent, sweet, thermogenic, anodyne, anthelmintic, alterant, antiperiodic, antispasmodic, anti inflammatory, antipyretic, antiemetic, digestive, carminative, appetizer, stomachic, constipating, cardio tonic, depurative, haematinic, expectorant, aphrodisiac, rejuvenating, galacto-purifier and tonic . It is useful in vitiated conditions of vatha, burning sensation, hyperdipsia helminthiasis, dyspepsia, flatulence, stomachalgia, intermittent and chronic fevers, inflammations, gout, vomiting, cardiac debility, skin diseases, leprosy, erypeals, anaemia, cough, asthma, general debility, jaundice, seminal weakness, urinary and spleen diseases.

Pharmacological Properties of Pathyshadanga

Name	Rasa	Guna	Veerya	Vipaka	Karma	Useful parts
Hareethaki	Pancharasa Kashaya	Laghu, Rooksha	Ushna	Madhura	Thridoshaharam	Phalam
Vibheetaki	Kashaya	Laghu, Rooksha	Ushna	Madhura	Kaphapittaharam	Phalam
Amalaki	Pancharasaam	Guru Rooksha	Seetha	Madhura	Thridhoshahara	Phalam
Bhoonimba	Thiktharasa	Laghu, Rookshaha	Seetha	Katu	Kaphapittaharam	Panchakam
Nimba	Tikthakashaya	Laghu	Seetha	Katu	Kaphapittaharam	Twak
Guduchi	Tikthakashaya	Snigdha	Ushna	Madhura	Thridhoshahara	Khandam
Haridra	Thiktha, Katu	Laghu, Rookshaha	Ushna	Katu	Kaphapittahara	Khandam

Part – III
Methodology

Materails and Methods

Observation, Analysis & Interpretation

3.1. MATERIALS AND METHODS

Importance of the present study

Ardhavabhedaka imposes an enormous health burden on individual headache suffers and on society. The high levelsof pain and disability associated with under diagnosed *Ardhavabhedaka*or inadequate treatment of *Adhavabhedaka* offer a potential target for health care intervention. The development of new management techniques for of *Ardhavabhedaka* continues to be an active area of research in neurology.

The sufferer of *Ardhavabhedaka* need not come into hospital for its management alone. They may come to the other OP Departments for

entirely different disease. The research worker being a teacher expects to utilize the service of house surgeons and other teaching staff for case identification, management and follow up.

As *Ardhavabhedaka* is dependent up on various systems of the body, the help of various specialists in medicine including ENT, Neurology and Ophthalmology is to be availed. Scientific analysis is to be done at prime centers of excellence like medicalcolleges, universities and autonomous institutions.

The service of two yoga specialists, one trained in the practical method and other its theoritical aspects, is to be availed. Despite recent advances in the management of *Ardhavabhedaka* there remains a significant group of *Ardhavabhedaka* patients with frequent unsatisfactorily treated attacks. Now a day the tipical treatment in the emergency department has been to relay on narcotic analysis. There is a necessity for a safe therapeutic mesure for the benefits of patients who run at the risk of narcotic addition because of *Ardhavabhedaka* attacks.

Prophilactic treatment of migraine is far from satisfatory at the present time even though a number of unrelated agents are available and are partially effective. Improvements in prophylactic therapy are essential and efforts of scientists, researches and clinicians should be directed towards this goal.

As there is of effective curative therapy in the modern medicine and keeping in view the side effect, which are caused due to prolonged usage of narcotic analgesics a safe prophilactic treatment measure is tobe considered which reduces.

Selected study Group

Group A	Group B	Group C
60 Patients	60 Patients	60 Patients
Pranayama	Pathyshadangam	Pathyashadangam
Placebo	Placebo	Pranayama

Pathyashadangam and *Pranayama* applied together is the best holistic therapy possible as it is based on practical and scientific experiments performed following natural laws over thousands of years on human beings and gaining recognition globally as an effective and viable means of promoting health.

The present study aims at the safest effective prophylactic and curative therapy by the combination of *Pathyshadangam* and *Pranayama* with minimum cost, which is affordable to the common man of the society with no side effects.

Aims and objectives of the study

- To asses the prevention of *Ardhavabhedaka* by *Pathyashadanga* and *Pranayama*.
- To see the efficacy of *pranayama* in *Ardhavabhedaka*.
- To see the efficacy of *Pathyashadangam* in *Ardhavabhedaka*.
- To see the efficacy of combination of *Pathyashadangam* and *Pranayama* in Ardhavabhedaka.
- To decrease the frequency of the attacks.
- To decrease the intensity and duration of attacks.
- To compare the efficacy of three treatment groups.

Population

In the present study the population refers to the patients who were diagnosed as suffering from *Ardhavabhedaka*.

Sampling

The researcher has decided to asses only a representative sample of the population. The sample for the present is selected in such a way that it reflects as far as possible everyt aspect of population.

Sample size

The present study constitutes a sample size of one hundred eighty patients selected from OPD of *salakyathantram*, Vaidyaratnam Ayurveda

college Hospital, Poochinnipadam, Thrissur, Kerala. The subject are randomly allocated into three groups of sixty patients in each.

Inclusion criteria

- ✓ Patients with clinical features suggestive of *Ardhavabhedaka*.
- ✓ Patients in the age group of 10-60 years.
- ✓ No sex discrimination.
- ✓ No discrimination based on occupation, geographic area, religion or caste, duration of illness, type and gravity of *Ardhavabhedaka* etc.

Exclusion criteria

- × Patients who are below 10 years and above 60 years.
- × Patients suffering from other systemic diseases like Diabetis mellitus with uncontrolled sugar values, tuberculosis and heart diseases.
- × Patients suffering from all other types of headache.
- × Patients who are not willing to participate in the study.
- × Pregnant women and women in puerperium were excluded from the study.
- × Patients suffering from sexually transmitted diseases.

Research approch

The research approach adopted in the present study is clinical study. A combination of *pathyashadangam* and *Pranayama* only.

Research design

Here the researcher has adopted the comparison between the groups a research design. In the present study the subjects are randomly allocated into three groups, Group A, B and C. Patients falling in the group A treated with *Pranayama* and placebo. Patients in the group B are treated with *Pathyashadanga* and placebo. Patients in the group C are treated with the combination of *Pranayama* and *Pathyashadanga*. To assess the effectiveness the possible symptoms like headache, nausea, vomiting etc will be considered and can be assigned scores according to the gravity of the condition. The scores will be considered for statistical analysis.

Data collection and analysis

The data collection method used in the present study is the interview cum examination technique. The data is collected on the special proforma charted for the purpose. Statistical analysis of relevant data has been made after scrutinising and screening them. Data are presented in charts, tables and graphs. Mean score of parameters of various groups are analyzed and statistical significance between the mean of various study parameters were derived, for testing the hypothesis formulated for

quantitative data, χ^2 square test and for qualitative data relevant 't' tests were done. All statistical data were computed and analysed.

Research site

In the present study patients were selected from the special OP in Salakyathanthra Department of Vaidyaratnam Ayurveda College Hospital, Poochinnipadam, Thrissur, Kerala as the setting of study.

Duration of the study

The duration of the active study period is 90 days, followed by a follow up period of 15 months. Thus the total duration is fixed at 18 months.

Detailed treatment methodology

Group A

- The patients who are falling in group A managed with pranayama and placebo
- Pranayama
- Nadi sudhi Pranayama - 10 rounds
- Chandranuloma Pranayama - 10 rounds
- Bhramari Pranayama - 10 rounds
- Seetali / Seetkari Pranayama - 10 rounds.

Deep relaxation technique

The above said criteria were selected because it was found to be beneficial in the patients of *Ardhavabhedaka* treatment period consists of three months. This technique is expected to control anxiety and other psychological distress.

Group B

- The patients included in the group B were treated with *Pathyashadangam* and placebo. *Pathyashadangam kashayam* 90 ml. two times daily for 3 months with jaggery prepared as per classical method already narrated in detail in drug review (48gm. of *Pathyshadangam* ingredients of medicine is taken, cleaned in running water, chopped and put in 2 litres of water boiled, reduced to 180 ml. filtered 90 ml is administered two times daily with 5gm of unbleached jaggery).
- *Nasyakarma*, with oil preparation of *Pathyashadagam* in *mridhupaka* for 7 days.
- *Abhyangam*, with oil preparation of *Pathyshadagam* in *kharapaka*.

Group C

- The patients included in the group C were treated with *Pranayama* and *Pathyashadagam* as narrated above in group A and B for a period of three months.

Instructions

The patients in all the three groups were strictly insisted to avoid triggering factors listed below;

- Intake of tea/coffee/alcohol/smoking
- Cold drinks/ice creams/ chocolates/cakes/pasteries/bakery items
- Eatables, which are deep fried and rich in oil content
- Excessive fat intake -beef/ fried fish, chips etc. (vegetarian diet is preferred)
- Other eatables such as melted butter, malt, toast, pickles rich in preservatives etc.
- Day sleep and night awakenings
- Missing meals (regular intake of meals is advised)
- Irregular bowel habits (constipation should be relieved)
- Travelling should be minimised
- Over exertion leading to physical strain
- Anxiety/ mental stress.

Psychological reassurance

At times intensive psychotherapy and psychoanalysis may be necessary. Change in the life style and behavioural attitude may to the

prevention of recurrent attacks. Some of the simple rules, which are advised to the patient.

- This is not a perfect word. Families and friends too have their failings. Perfection is rarely attained. So be satisfied with what you have. Tolerance makes understanding the other fellow easier. It sets an attainable standard. Do not a slave to the clock. Work at your own pace does as much as you can. Trying to meet too many deadlines only creates tension.
- You cannot please every body. So stop, trying to be too popular. Giving your friends and family a chance to love you.
- Be efficient. But not to the extent that perfection becomes a burden.
- Speak up if you want to you cannot please everybody. Honesty and directness break down barriers and make friendship easier.
- Approve of yourself. You are as good as next fellow.
- Stop being so critical of your negative feeling. Everyone is ambivalent at times; so do not worry so much about loving and hating.

- Stop feeling so guilty. We are human beings and we all make errors. Give a little and you will get a lot - may be a reduction of pain in your head.

Follow up period

The follow up period consists of six months. During this period a strict emphasis is made to the patients for following the instructions and advices given to them. Only patients who are willing to follow the above cited rules and regulations promptly are included under the study. During the follow up period the patients are advised to maintain a headache diary. At the end of six months the frequency of attacks, the intensity and duration of the attacks and the other associted symptoms like vomiting, nausea, photophobia, phonophobia and odorophobia are considered and assigned scores according to the gravity of the condition and their scores are considered for the statistical analysis.

The statistical analysis is done the help of computer package. The collected are transferred in to master sheets. Then the statistical constants like percentages, arithmetic mean and standard deviation of the improvement scores recorded in various group are tested statistically. The scores are considered for the statistical analysis. In order to the hypothesis the statistical test like χ^2-Square test, paired test and student 't' test are employed.

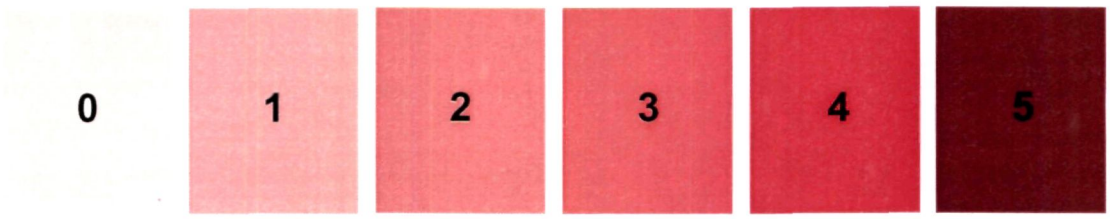
Pain asses are with Numerical scale, Visual analogue scale and verbal analogue scale etc. For intensity of head ache, a pain scale of 0 to 5 was utilised. The representation of the values were,

0 – not headache

1 – the minimal discomfort

5 – the most excruciating pain that the patient can imagine.

The intermittent values represent the intensities in between. For he sake of clarity of expression, a colour scheme, as given below, was also used as the best option available.



Even though a pain scale of 1 to 10 is advocated most often. If was found to differentiate the values in between 3 and 7 was a job for the participants. For e.g. they often failed to clearly indicate their head pains which fall between 5 and 6 or 6 and 7. So a more convenient scale of 0 to 5 was preferred.

In the of case of other features, a scale of 0 to 3 was adapted. Here the corresponding clinical picture was,

0 – symptoms absent

1 – mild symptoms

2 – moderate symptoms

3 – severe symptoms

This type of scoring is the one having wide usage and acceptance.

Using this method, all the participants were assessed and scores obtained were recorded.

3.2. OBSERVATIONS, ANALYSIS AND INTERPRETATIONS

In this study, 180 patients were selected and divided into 3 groups (60 patients each) according to inclusion and exclusion criteria. Group A managed with Pranayama and Placebo, Group B with Pathyashadanga and Placebo and Group C treated with Pranayama and Pathyashadanga.

The statistical data were computed and percentage, mean, standard deviation were calculated. The result was interpreted on the basis of statistical analysis.

Table - 1 Distribution according to Age

Age (in years)	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
10-30	26	43	22	37	24	40	72	40
30-50	28	47	34	57	32	53	94	52
51-60	06	10	04	06	04	07	14	08
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

In the study, the age distribution of all the three groups treatment A, treatment B and treatment C appeared to be similar. how ever numerically slight variation are noted. The difference in percentage distribution of various age groups was tested statistically and was found not significant. There fore it is inferred that all the three groups are identical with respect to age and hence will not have any possible influence of age over the final out come measures. while considering all the three groups together majority of the patients (52%) were in the age group 30-50 years. 40% were in the age group 10-30 years and 0.8% of patients were in the age group of 51-60 years.

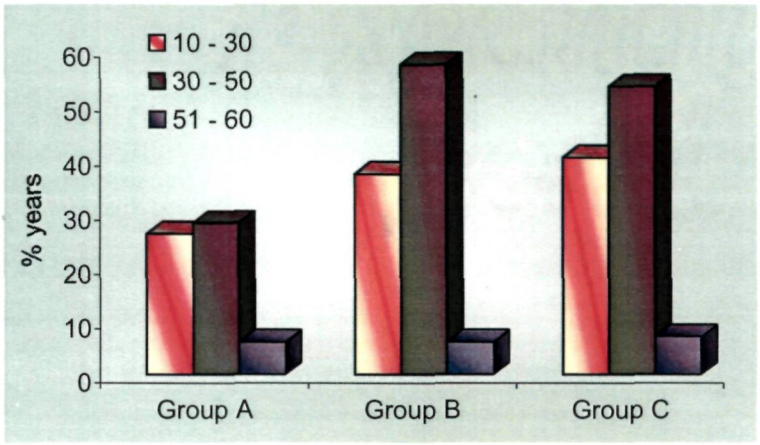
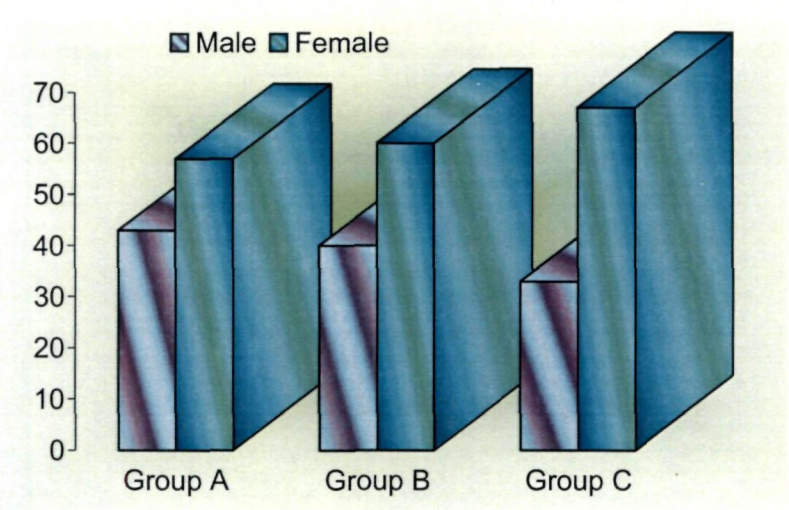


Table - 2 Distribution according to sex

Sex	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Male	26	43	16	40	26	33	68	38
Female	34	57	44	60	34	67	112	62
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**



Out of 180 patients studied 62% were females. Thus it can be inferred that two - fold increase in the incidence of Ardhavabhedaka may be probable in the community. While the association between the sex of the patients and the patients allocated to different groups was tested , no significant relation was established . It is therefore inferred that the males and females are represented in all three groups equally.

Table - 3 Distribution according to occupation

Occupation	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Professionals	16	27	18	30	14	23.3	48	27
Business men	06	10	06	10	06	10	18	10
Clerical Staff	04	07	10	16.6	10	16.6	24	13.3
Students	14	23	10	16.6	12	20	36	20
House Wives	06	10	06	10	06	10	18	10
Others	14	23	10	17	12	20	36	20
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

With regard to the occupational status of the participants 27% were professionals and all other categories of 80% includes mostly students, housewives, clerical staff etc. In order to give equal weights to be occupational status, patients were allocated at random into three groups and the statistical test showed no significant difference between the groups while the professionals were compared with non - professionals.

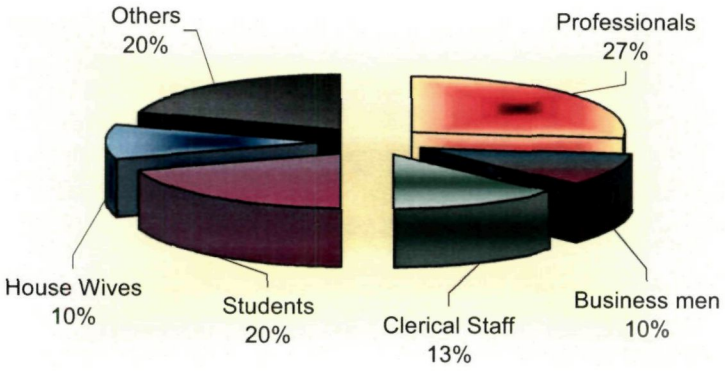
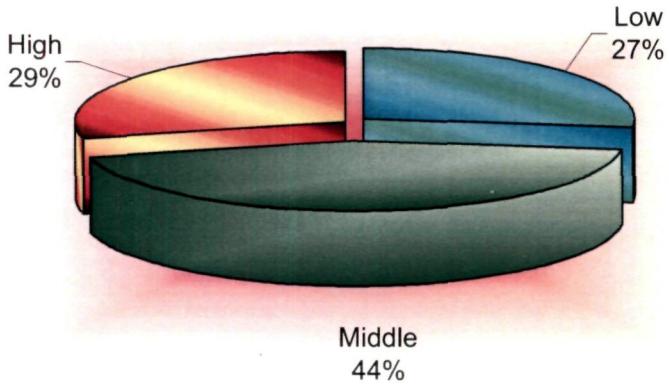


Table - 4 Distribution according to Economic status

Economic Status	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Low	28	47	10	17	10	17	48	27
Middle	12	20	28	47	40	67	80	44
High	20	33	22	36	10	16	52	29
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**



In the present study the percentage of low socio-economical status comparatively high (47 %) in group A than group B and C (17 % each). The statistical test also showed that the difference was highly significant. It was happened in the study probably because the patient in low economic status consended themselves to include in group A (Pranayama) mostly for avoiding hospitalisation. It was that in the present study 27 % of the patient were from low socio- economic status. 44 % from middle class and 29% from high socio -economic status.

Table - 5 Distribution according to the age onset

Age Onset	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Below 20 years	42	70	30	50	36	60	108	60
20-40 years	18	30	30	50	24	40	72	40
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

It is worth while to see that 60% of the patient had reported the onset of the disease as below 20 years. It is suggestive of the early of the disease and can have influence that *Ardhavabhedaka* is very much associated with the reproductive cycle starting in the early ages of reproduction in women. In the rest 40 % of the patients the age of onset was between 20-40 years.

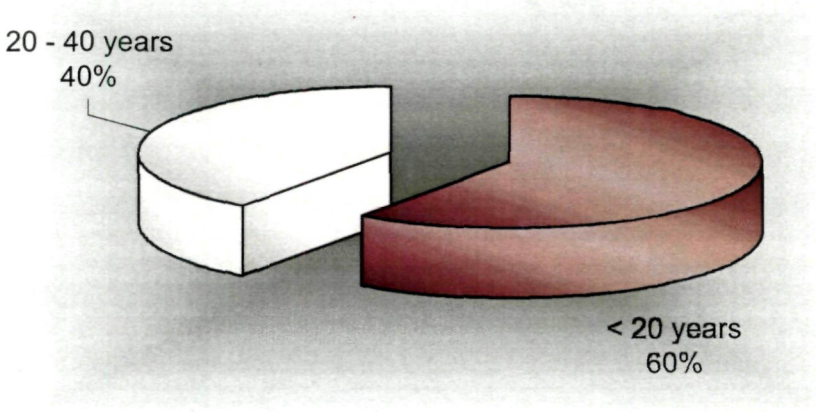
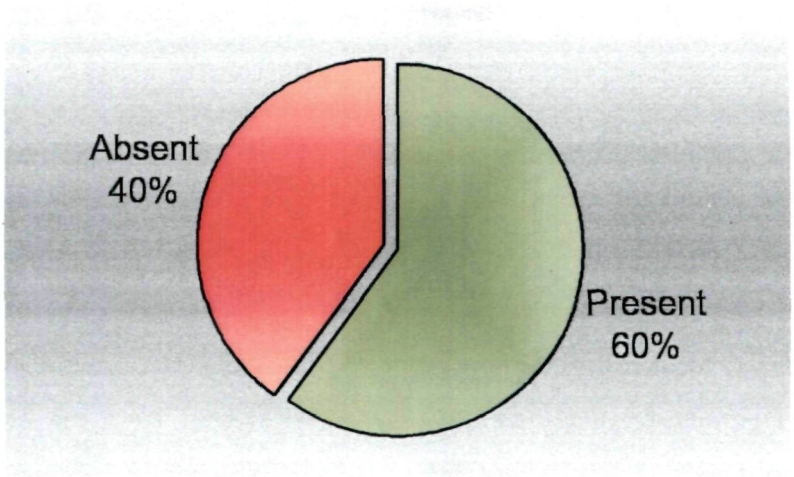


Table - 6 Distribution according to the Hereditary Factor

Hereditary factor	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Present	34	57	38	60	36	60	108	60
Absent	26	43	22	37	24	40	72	40

The hereditary factor was present in 60% of patients. In the rest 40% of the patients the hereditary factor was absent. How ever to get equal representation. The patients with the hereditary factor and with out the hereditary factor were equally allocated to different groups.



The statistical test also established no significant difference between the groups.

Table - 7 Distribution according to Anxiety

Anxiety	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Anxious individual	39	65	43	71.66	36	60	118	65.55
Normal individual	21	35	17	28.33	24	40	62	34.44
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

Thus it can be inferred that two fold increases in the incidence of *Ardhavabhedaka* is probable in the community. While studying , no significant relate was found between different groups of patients.

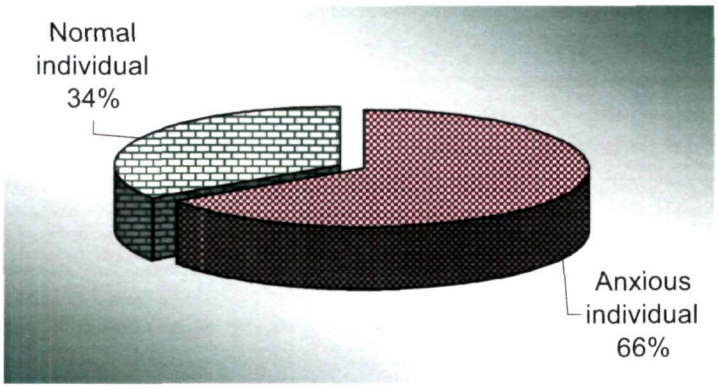


Table - 8 Distribution according to Diet

Diet	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
Vegetarian	16	26.66	10	16.66	15	25	41	22.77
Mixed	44	73.33	50	83.33	45	75	39	77.22
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

77.22% (139) of the patients were using mixed diet, where as only 22.77% (41) were using pure vegetarian food. The mixed diet were using in the group A 73.33% (44) , in the group B 83.33% (50) and in the group C 75% (45). The pure vegetarian diet were using in the group A. 26.66% (16) in the group B 16.66% (10) and in the group C 25% (15) .

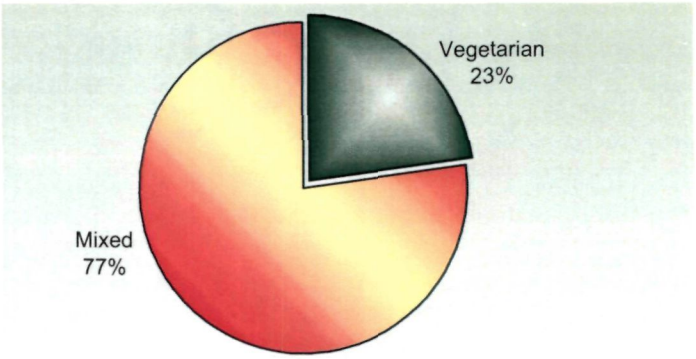
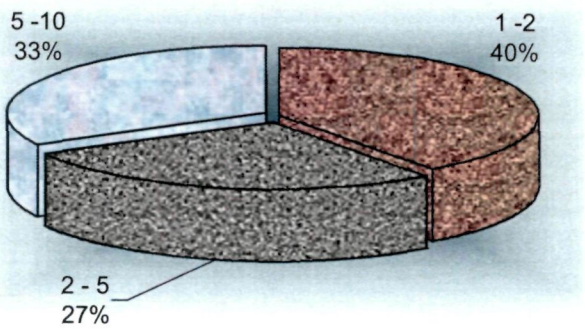


Table - 9 Distribution according to Chronicity

Chronicity	Group A		Group B		Group C		Total	
	No.	%	No.	%	No.	%	No.	%
1-2	23	38.33	26	43.33	23	38.33	72	40
2-5	16	26.67	16	26.67	17	28.33	49	27.22
5-10	21	35	18	30	20	33.33	59	32.78
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**

The minimum chronicity that was required for including in the study was 72 (40%) patients were included in than 1-2 years.

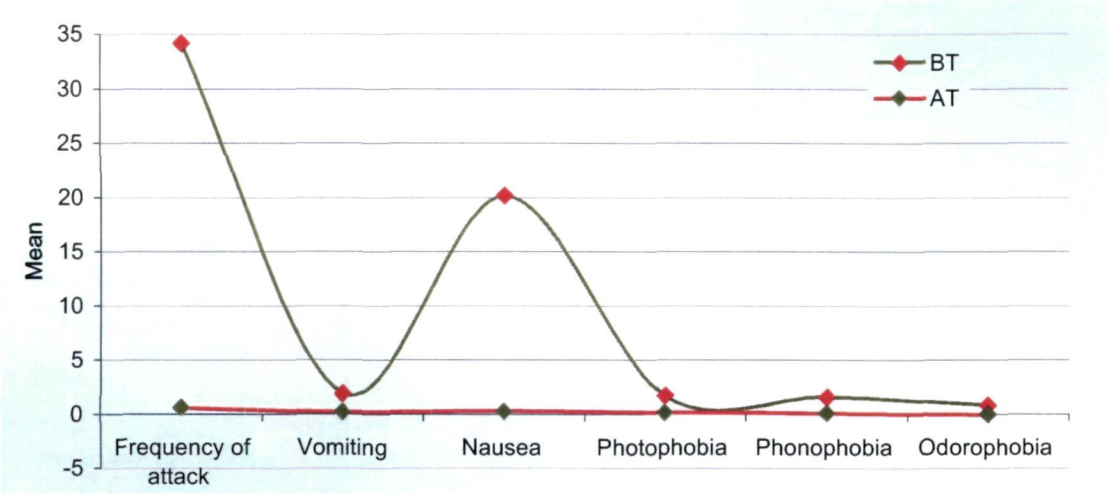


49 (27.22%) patients with chronicity for more than 2 years. The remaining 59 (32.78%) were sufferers of *Ardhavabhedaka* for more than 5 years.

Table - 10 Mean scores of assessment variables before and after 6 months of treatment in group A and level of significance assessment

Variables	Mean		Paired t value	p value
	Before 6 months	After 6 months		
Frequency of attack in 6 months	34.20	0.60	06.16	<0.001
1. Intensity	03.00	0.67	13.31	<0.001
2. Duration (in hrs.)	36.10	3.73	07.34	<0.001
Vomiting	01.90	0.20	07.08	<0.001
Nausea	20.17	0.26	07.72	<0.001
Photophobia	01.70	0.17	07.76	<0.001
Phonophobia	01.60	0.10	06.28	<0.001
Odorophobia	00.83	0.00	03.86	<0.001

The effectiveness of the treatment was measured with the help of scoring technique as well as frequency of attack. Prior to initiation of the Pranayama the mean frequency of attack in six months time was estimated as 34.2, which has reduced to even less than (mean 0.60) after



the treatment. There fore the treatment was almost 100%effective in preventing the attacks and the reduction was highly statistically significant ($p < 0.001$). In those cases that had attack even after the treatment the mean intensity score was only 0.67 in place of the mean score of 3, which was recorded before treatment.

In this case too the statistical test for equality of means of paired observations (paired t test) turned out to be highly significant.

Therefore, it is inferred that the treatment A is very much effective not only to prevent the frequency of attack but also to reduce the intensity as well. A similar finding was observed in the case of other variables assessed. The mean duration of each spell was recorded as 36.1 hrs. during 6 months prior to the treatment. At the same time it has come down to 3.73 hours only after the treatment.

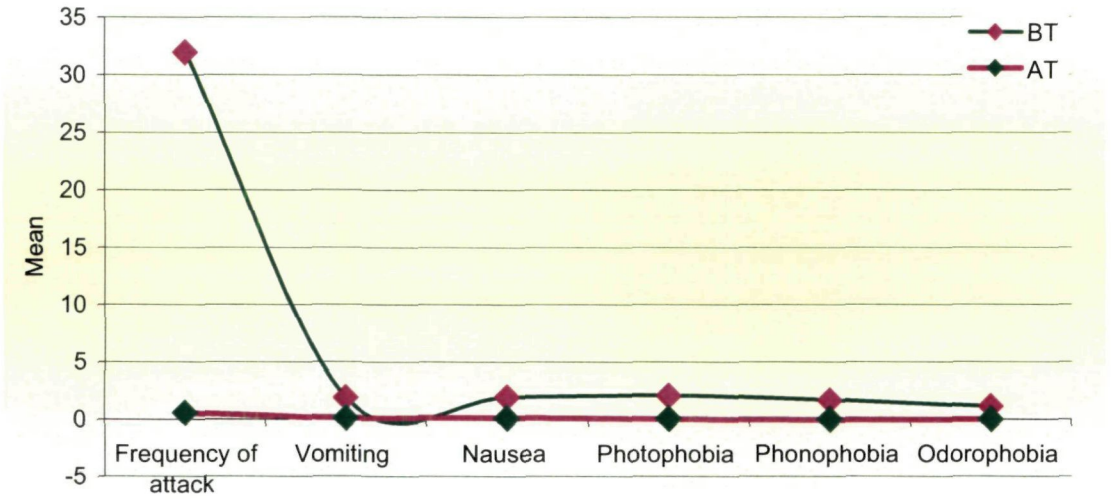
The severity of vomiting was assessed with the help of scoring

technique and ther was 89% reduction noted after treatment. In the other words the mean severity score of 1.9 recorded earlier has been reduced to 0.20 after the treatment. The mean score of nausea photophobia, phonophobia also showed similar reduction. Regarding odorophobia the mean score of 0.83 has been reduced to nil after treatment.

Invariably, in all assessment variables the reduction noted after the treatment was highly statistically significant.

Table - 11 Mean scores of assessment variables before and after 6 months of treatment in group B and level of significance

Variables	Mean		Paired t value	p value
	Before 6 months	After 6 months		
Frequency of attack in 6 months	32.00	0.53	07.08	<0.001
1. Intensity	03.00	0.70	12.94	<0.001
2. Duration (in hrs.)	32.70	2.87	07.18	<0.001
Vomiting	01.87	0.07	07.52	<0.001
Nausea	01.90	0.07	07.96	<0.001
Photophobia	02.07	0.03	08.83	<0.001
Phonophobia	01.67	0.00	06.21	<0.001
Odorophobia	01.10	0.00	04.23	<0.001



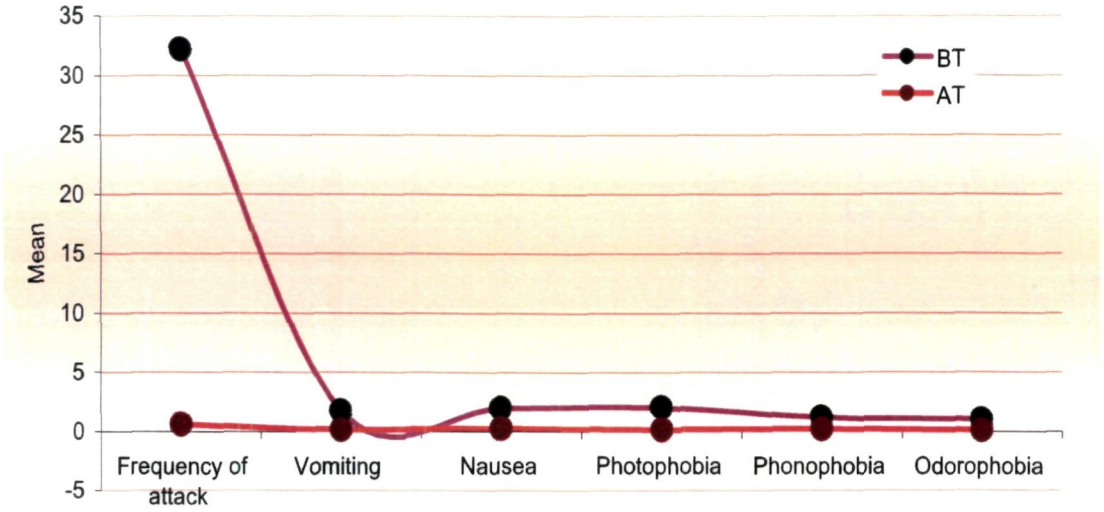
In the case of treatment B the mean frequency of attack was 32 before treatment which has come down to 0.53 after the treatment. Regarding the intensity the initial mean score of 3 has come down to 0.70 and the difference was highly statistically significant.

In group B patients the mean duration of each attack was 32.7 prior to treatment but has reduced to 2.87 after the treatment. The reduction noted in the case of severity of vomiting, nausea, photophobia etc. showed similar reduction as that of group A. In all the assessment variables the statistical tests happened to be highly significant, which is suggestive of the effectiveness of treatment B.

Table - 12 Mean scores of assessment variables before and after 6 months of treatment in group C and level of significance assessment

Variables	Mean		Paired t value	p value
	Before 6 months	After 6 months		
Frequency of attack in 6 months	32.23	0.57	07.1	<0.001
1.Intensity	02.97	0.37	21.31	<0.001
2.Duration (in hrs.)	33.27	1.46	07.32	<0.001
Vomiting	01.70	0.13	07.18	<0.001
Nausea	01.93	0.23	07.39	<0.001
Photophobia	01.97	0.13	08.39	<0.001
Phonophobia	01.20	0.17	05.31	<0.001
Odorophobia	01.00	0.10	03.75	<0.001

In the case of treatment C the initial mean frequency of 32.23 has reduced to 0.57 after the treatment. The equality of mean frequency of attack before and the treatment was tested statistically and was found significant (T=7.1; d.f = 29; p>0.001) . The intensity of *sirasoola* also showed remarkable reduction after the treatment. The extent of reduction in the intensity was 87.5 %.



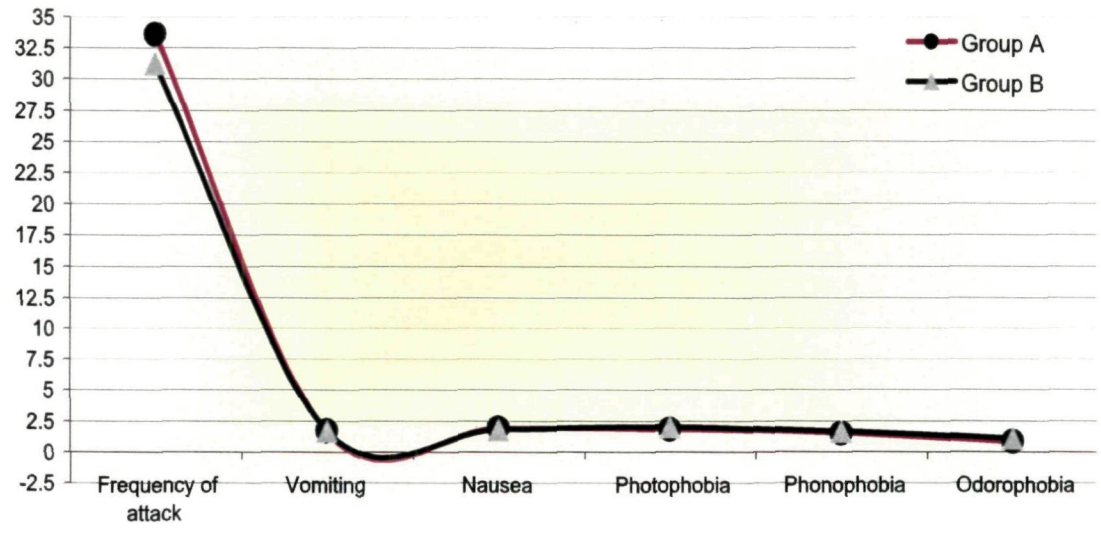
The most important finding in the case of group C was the maximum reduction noted in the mean duration *Ardhavabhedaka* attack after the treatment. In group C the mean duration after the treatment was only 1.46 hours where as it was 2.87 hours in group B and 3.73 hours in group A.

Thus the combination of group A and B which has been administered as group C appeared to be better while the mean duration of the episode after the treatment is considered.

In the case of other assessment variables like vomiting, nausea, photophobia etc. the findings were at par with that of group A and B. In allthese cases the improvement noted was highly statistically significant.

Table - 13 Comparison of improvement in assessment score of Group A with Group B and level of significance

Assessment Variables	Mean ± SD		t value	p value
	Group A	Group B		
Frequency of attack	33.6 ± 29.9	31.2 ± 24.1	0.34	>0.05
1. Intensity	02.3 ± 0.96	02.2 ± 0.9	0.04	>0.05
2. Duration (in hrs)	31.97 ± 23.9	32.4 ± 24.2	0.07	>0.05
Vomiting	01.7 ± 1.34	1.7 ± 1.28	0.09	>0.05
Nausea	01.9 ± 1.35	1.83 ± 1.28	0.21	>0.05
Photophobia	01.8 ± 1.25	2.03 ± 1.27	0.80	>0.05
Phonophobia	01.5 ± 1.31	1.67 ± 1.47	0.47	>0.05
Odorophobia	0.83 ± 1.18	01.1 ± 1.42	0.80	>0.05



It is attempted to see the comparative effectiveness of group A with that of group B. From table 11 it can be seen that the mean improvement scores computed for group A was comparatively high numerically compared to mean improvement scores of group B, in the case of all assessment variables except photophobia, phonophobia and odorophobia.

However the statistical test for equality of means student t test showed the differences as significant ($p>0.05$). So it is concluded that group A is having slight inferior effect with that of group B compared to group C except the numerical improvement recorded in group A.

Table - 14 Comparison of improvement in assessment score of Group A with Group C and level of significance

Assessment Variables	Mean ± SD		t value	p value
	Group A	Group C		
Frequency of attack	33.6 ± 29.9	30 ± 23.03	0.34	>0.05
1. Intensity	2.3 ± 0.96	2.6 ± 0.67	1.4	>0.05
2. Duration (in hrs)	31.97 ± 23.9	32.4 ± 23.9	0.07	>0.05
Vomiting	1.7 ± 1.34	1.70 ± 1.24	0.21	>0.05
Nausea	1.9 ± 1.35	1.7 ± 1.26	0.59	>0.05
Photophobia	1.8 ± 1.25	1.93 ± 1.26	0.41	>0.05
Phonophobia	1.5 ± 1.31	1.30 ± 1.34	0.58	>0.05
Odorophobia	0.83 ± 1.18	0.90 ± 1.32	0.22	>0.05

A comparative analysis of the improvement in assessment score of group A with group C also showed no statistically significant trends still the improvement in mean frequency of attack was comparatively more in group A (mean-33.6) than that of group C (mean-30).

Instead, group C showed a numerically better improvement in the intensity of sirasoola and duration of attack. Thus it is inferred that group a is inferior to group C.

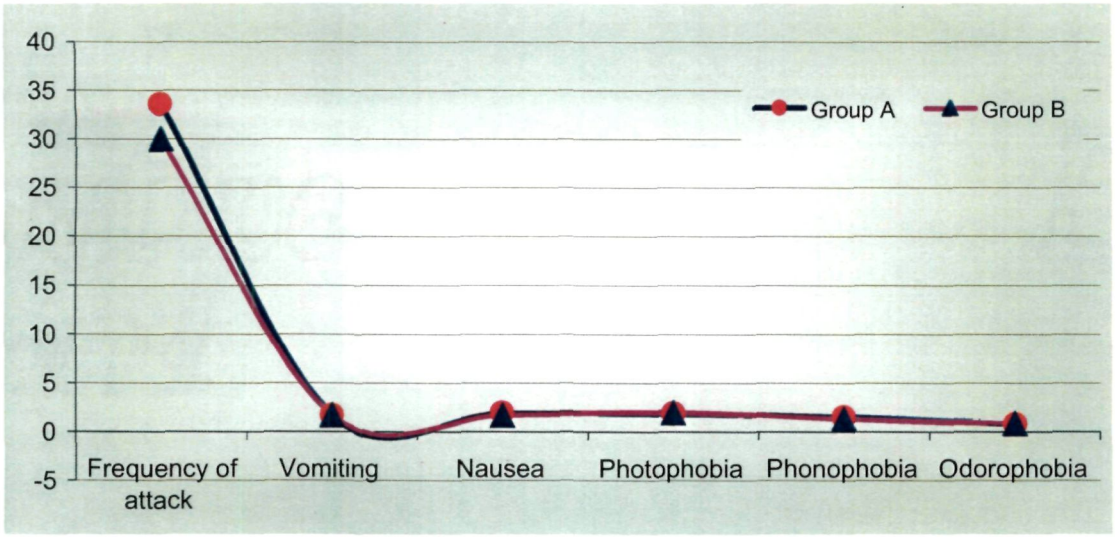
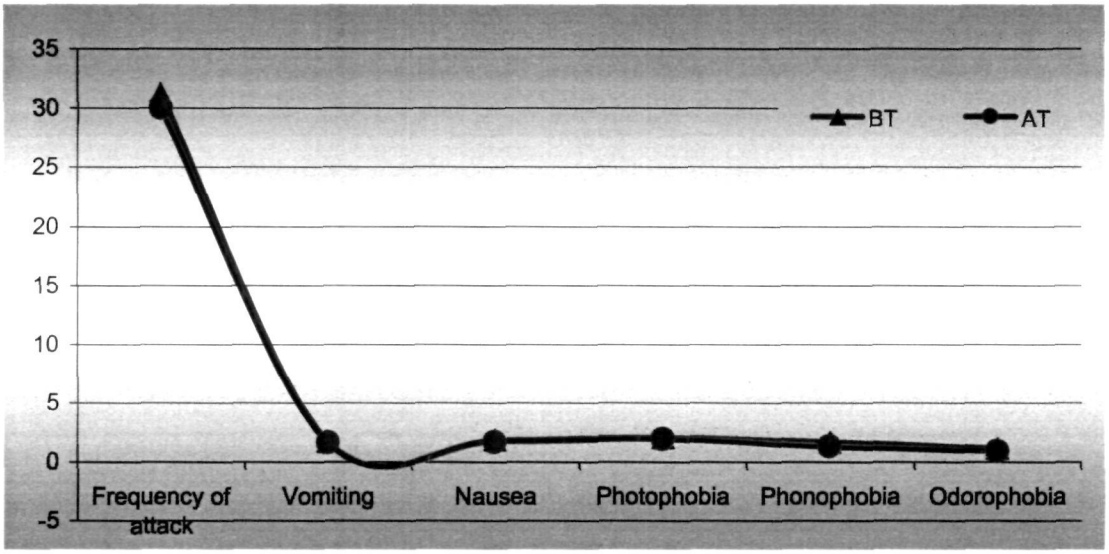


Table - 15 Comparison of improvement in assessment score of Group B with Group C and level of significance

Assessment Variables	Mean ± SD		t value	p value
	Group B	Group C		
Frequency of attack	31.2 ± 24.1	30 ± 23.03	0.19	>0.05
1. Intensity	2.23 ± 0.9	2.57 ± 0.67	1.76	>0.05
2. Duration (in hrs)	29.8 ± 22.7	31.97 ± 23.9	0.36	>0.05
Vomiting	1.73 ± 1.28	1.63 ± 1.24	0.31	>0.05
Nausea	1.83 ± 1.28	1.7 ± 1.26	0.39	>0.05
Photophobia	2.03 ± 1.27	1.93 ± 1.26	0.30	>0.05
Phonophobia	1.67 ± 1.47	1.30 ± 1.34	1.02	>0.05
Odorophobia	1.10 ± 1.42	0.90 ± 1.32	0.56	>0.05



It was also attempted to see whether there was any change in the improvement score of group B with group C. Here again no appreciable difference was observed except in the case of intensity of *sirasoola* and duration while the mean improvement in intensity of *sirasoola* was 2.23 in group B it was 2.57 in group C.Similarly the mean duration improvement was approximately 32 hours, in group Compared to 30 hours group B. Regarding the other variables assessed the mean improvements were almost equal numerically. Thus it is concluded that group B and C are equal in the effectiveness statistically in all out come measures but showed slightly better performance in group C numerically in the case of intensity of *Sirasoola* and duration of attack is concerned.

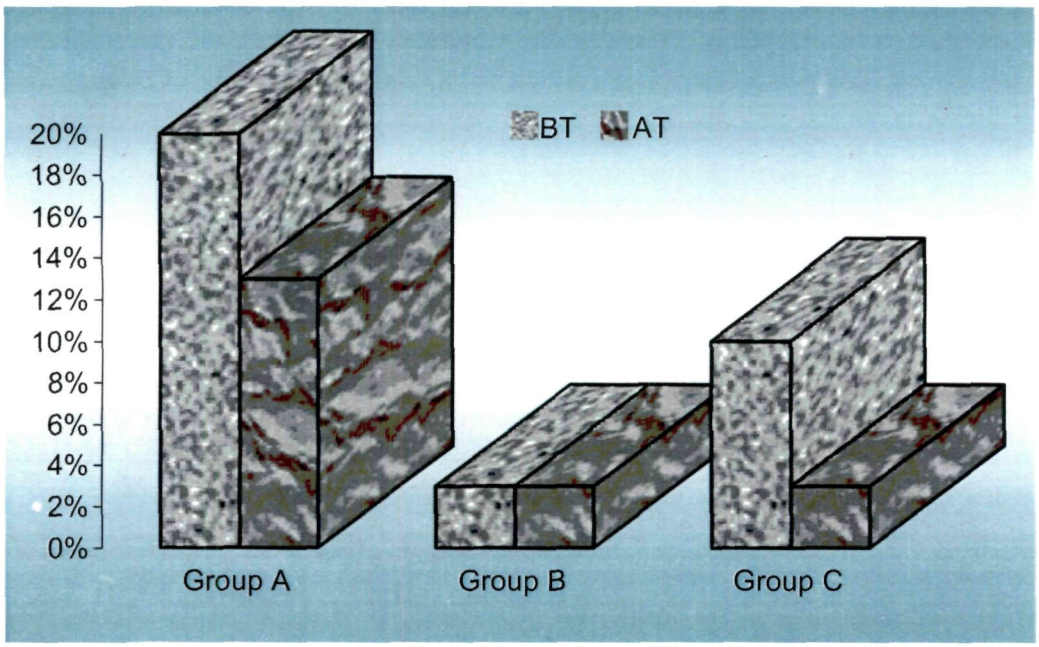
The efficacy of treatment of group A is inferior to group C. The efficacy of treatment of group A is slightly inferior to group B. The efficacy of treatment in group C is superior to group B.

The efficacy of treatment in group C is superior to group A. So on the whole group C was found to be superior to group A.

Table - 16 Distribution of cases according to present of aura

Group	BT		AT	
	No.	%	No.	%
A	6	20	4	13
B	1	3	1	3
C	3	10	1	3

There is no difference in the distribution of patient between A, B and groups in the presence of aura. It was seen that in 20% of cases in group A history of aura was present in group B aura was present in 3% cases in group C it was present in 10% cases.



Part – V

Discussion, Summary & Conclusion

5.1. DISCUSSION

The changing concepts of life, urbanization development in the modern world have entirely changed the concept of medicine and its approach in recent years. The medical profession is facing rapid growth of newer disorders whose course lie in the society and psychosomatic disorders q are posing a challenge before the present day medical profession.

There is sufficient potential in *Ayurveda* and *yoga* philosophy be implemented to health care and medical management in the present time. Modern therapy mostly renders a palliative relief, and does not prevent

recurrence of the disease. More over it incurs a heavy financial burden for the patients, their families and the nation in turn. In fact intensive medical care has become an expensive affair. A developing nation like India can not afford such an approch. The answer lies in prevention and management of diseases in a holistic way. *Ayurveda* lays greater emphasis on maintenance of positive health. It envisages the total welfare of man. *Pranayama* specifically ensure the psycho spiritual development. *Ayurveda* comprehends well on the study of the nature of ill health and the curative measures for the treatment of various diseases. The philosophy of *Pranayama* has a solid platform and elobrate practical technology but it has little to offer in terms of pathology and diagnosis. *Ayurveda* is a full medical science with its own fundamental principles, concept of life and health, pathology, diagnosis and therapy. *Pranayama* is a simple, safe, effective and highly economical form of life style and can be easily grafted to the corpus of *Ayurveda*.

So in the present study an attempt was made to combine the *Pranayama* with the *Pathyashadangam* and to its efficacy in *Ardhavabhedaka* and asses its prevention. This study provides evidence that the combination of selected *Pathyshadangam* and *Pranayama* is very effective in *Ardhavabhedaka* than any other mode of treatment.

Among the 180 patients studied 52% of the patients were in the age group of 30- 50 years, 40% of the patients were in the age group of below 30 years and 8% patients were in the age group of 50- 60 years.

This gives evidence that *Ardhavabhedaka* starts in the childhood, peaks during the productive years of life and gradually slows down with the age comprehends well on the study of the nature of ill health and the curative measures for the treatment of various diseases. The philosophy of *Pranayama* has a solid platform and elobrate practical technology but it has little to offer in terms of pathology and diagnosis. *Ayurveda* is a full medical science with its own fundamental principles, concept of life and health, pathology, diagnosis and therapy. *Pranayama* is a simple, safe, effective and highly economical form of life style and can be easily grafted to the corpus of *Ayurveda*.

So in the present study an attempt was made to combine the *Pranayama* with the *Pathyashadanga* and to its efficacy in *Ardhavabhedaka* and asses its prevention.

This study provides evidence that the combination of selected *Pathyshadanga* and *Pranayama* is very effective in *Ardhavabhedaka* than any other mode of treatment.

Among the 180 patients studied 52% of the patients were in the age group of 30- 50 years, 40% of the patients were in the age group of below 30 years and 8% patients were in the age group of 50- 60 years. This gives evidence that *Ardhavabhedaka* starts in the childhood, peaks during the productive years of life and gradually slows down with the age after

fifties. It was seen that it was more prevalent in females (62%) than in males (38%). The female to male ratio 2:1 shows that the hormonal changes taking place during the menstrual cycle makes women more prone to *Ardhavabhedaka*.

When occupation was considered 27% of the patients were professionals and the rest73% included students, housewives, clerical staff etc. It was seen that *Ardhavabhedaka* was more common in professionals than others. Here the professionals included in the study were engineers, doctors, lecturers, lawyers, etc.

It might have happened because their life is more prone to mental stress and strain, which is one of the triggering factors for *Ardhavabhedaka*. Among the 180 patients 27% were from low economic status. It was also found middle class and 29% were from high socio economic status. It was also found that the age of onset of *Ardhavabhedaka* was below;

20 years in 60% patients, between 20-40 years in 40% patients. This shoes that *Ardhavabhedaka* has its beginning in the early adolescent period. In 60% of patients hereditary factor was present providing evidence the *Ardhavabhedaka* runs in families and influenced by hereditary susceptibility.

Among the 180 patients 65.55% were anxious individual and 34.44% were normal individual. In the distribution of according to diet

77.25% of the participants were using mixed diet where as only 22.77% were using pure vegitarian food.

The minimum chronicity required for including in the study was 40% participants were having chronicity more than1 year up to 2 years. 27.22% were with chronicity more than 2 years up to 5 years. 32.785 were suffers of *Ardhavabhedaka* for more than 5 years.

A pain scale of 0-5 was used to quantity and record the intensity of *Ardhavabhedaka* in each case. Before treatment, it was seen that 27.22% were having a pain score of 46.61% were with pain score of 3, 19.44% were with pain score of 2, and 6.66% were pain score of 1. So 4 was the maximum and 1 was the minimum score obtained.

The patients werediagnosed on the basis of clinical examination rather than based on investigations only yield a very little in the diagnosis of *Ardhavabhedaka*.

The three measures *Pranayama*, *Pathyashadangam* and the combination of *Pranayama* and *Pathyashadangam* were effective in preventing and curing the *Ardhavabhedaka*.

In patients treated with *Pranayama* the mean score of frequency of attacks was reduced from 34.2 to 0.60. Intensity was reduced from 3 to 0.67 and duration from 36.1 hours to 3.73 hours.

If other variables are considered the mean score of vomiting was reduced from 1.9 to 0.20, mean score of nausea from 20.17 to 0.26, photophobia from 1.70 to 0.17, phonophobia from 1.60 to 0.10, odorphobia from 0.83 to 0.

In patients treated with *Pathyashadangam* the mean score og frequency of attacks was reduced from 32.0 to 0.53. Intensity was reduced from 3.0 to 0.70 and duration was reduced from 32.7 hours to 2.87 hours. The mean score of vomiting was reduced from 1.87 to 0.07, nausea from 1.90 to 0.07, photophobia from 2.07 to 0.03, phonophobia from 1.67 to 0.03 odorophobia from 1.10 to 0.

In patients treated with the combination of *Pranayama* and *Pathyashadangam* the mean score of frequency of attacks was reduced from 32.23 to 0.57. Intensity was reduced from 2.97 to 0.37 and duration from 32.27 hours to 1.46 hours. The mean score of vomiting was reduced from 1.93 to 0.23, photophobia from 2.07 to 0.03, phonophobia from 1.20 to 0.17, odorophobia from 1.00 to 0.10.

When the treatment groups were compared the patients treated with *Pranayama* of yoga therapy and *Pathyashadangam* showed the best result in the reduction of frequency, intensity and duration of headache in their mean improvement scores. The other also showed significant reduction.

Prevention mainly aims at reduction in frequency, intensity and duration of attacks. The patients treated with the combination therapy achieved this *Ardhavabhedaka* can be compared to Migraine mentioned in modern classics. If the doshic involvement is considered the symptoms caused are mainly due to the vitiation of *vata* and *kapha*. All the drugs selected the therapy the quality of pacifying vata and kapha. As *Ardhavabhedaka* is one among the *sirorogas* keeping the concept of *'Nasa hi siraso dwaram'* in view nasya karma was adapted for the therapy, prior to the therapy snehana and swedana were done and after nasya, dhoomapana and gandoosha were advised.

A long with these *Pathyashadangam kashayam* was administered. all the *Pranayamas* selected over here are having the cooling effect on the body. Deep relaxation technique keeps the body and mind relaxed. Doctor patient relationship needs to be one of trust, mutual respect and empathy. an empathetic approch helps to assure the patients that the doctor really does understand what they feel, good consultation skill, counseling, strict emphasis on avoidance of trigger factors, change in the life style and behavioral aspect of the patients through health educaation etc. were the main points stressed.

The study proved that all these measures were of significant importance in changing the pattern of *Ardhavabhedaka* atack.

5.2. SUMMARY

The problem of the study was to asses the prevention of *Ardhavabhedaka* by *Pranayama* and *Pathyshadangam*. Included in the study was an attempt to see the efficacy of *Pranayama*, *Pathyashadangam* and the combination of *Pranayama* and *Pathyashadangam* in *Ardhavabhedaka*.

The subjects of the study were 180 patients selected from the Out patient Department of Salakyathanthra, Vaidyaratnam Ayuveda College Hospital, Poochinnipadam, Thrissur, Kerala. Data were collected on special proforma by interview cum examination techniques. To assess the

effectiveness the possible symptoms like headache, nausea, vomiting, etc. were considered and assigned scores according the gravity of the condition. The scores were considered for statistical analysis. The statistical analysis was done with the help of computer package. The collected data were transferred into master sheets. The statistical constants like percentages arithmatic mean, standard deviation, etc. were computed according to the duration of the assessment. The mean and standard deviation of the improvement scores recorded in various groups were also tested statistically. In order to test the hypothesis the statistical tests like χ^2 square test, paired 't' test and student 't' test were employed.

Applying standard formulae did all computations. The analysis of data revealed the following significant findings.

1. Among the 180 patients studied 52% of the patients were among the age group 30-50 years 40% of patients were among the age group below 30 years and 8% patients were in the age group 51-60 years.
2. It was seen that *Ardhavabhedaka* was more prevalent in females (62%) than in males (38%) in the ratio of 2:1.
3. 27% of the patients were professionals, and other 73% included students, housewives, clerical staff etc.
4. Patients from low socio status constituted 44% middle class constituted 29%, high socio economic status constituted 27%.

5. In 60% patients the age of onset was below 20 years. In 40% patients the age onset was between 20-40 years.

6. In 60% patients hereditary factor was present and it was absent in the other 40% patients.

7. In the patients treated with *Pranayama* and placebo (Group A) the frequency of attacks was reduced from a mean score of 34.2 to 0.60. The intensity of *sirasoola* was reduced from 3.0 to 0.67 and the duration of attacks was reduced fro 36.1 hours to 3.73 hours

8. In the treated with *Pathyashadangam* (group B) the frequency of was reduced from 32.0 to 0.53, intensity from 3.0 to 0.70 and duration of attacks from 32.7 hours to 2.87 hours

9. In the patients treated with the combination of *Pranayama* and *Pathyshadangam* (Group C) the frequency was reduced from 32.23 to 0.57. Intensity from 2.97 to 0.37 and duration of attacks from 32.27 to 1.46 hours.

5.3. CONCLUSION

1. A combination of *Pranayama* and *Pathyshadangam* were found to be effective in *Ardhvabhedaka* than any other mode of treatment.
2. The comparisons betwen the three treatment groups, Group A *(Pranayama)* with Group B *(Pathyashadangam)* and Group A *(Pranayama)* with Group C *(Pranayama* in combination with *Pathyshadangam)* and Group B *(Pathyashadangam)* with Group C *(Pranayama* in combination with *Pathyshadangam)* showed that Group C *(Pranayama* in combination with *Pathyshadangam)* was superior to Group A *(Pranayama)* and Group B *(Pathyashadangam)*.

3. The efficacy of treatment of GroupA *(Pranayama)* is slightly inferior to GroupB *(Pathyashadangam)* and Group C *(Pranayama* in combination with *Pathyshadangam)*.

4. The efficacy of treatment of Group B *(Pathyashadangam)* is superior to Group A and inferior to Group C *(Pranayama* in combination with *Pathyshadangam)*.

5. The efficacy of treatment of Group C *(Pranayama* in combination with *Pathyshadangam)*. is superior to Group A *(Pranayama)* and Group B *(Pathyashadangam)*.

6. On the whole Group C *(Pranayama* in combination with *Pathyshadangam)* was found to be the best therapeutic in the prevention and use.

Recommendations

1. As *Pranayama* and *Pathyashadangam* have proven to be effective in *Ardhavabhedaka* these measures can be implemented in the Ayurveda colleges hospitals, and other such relevant institutions including research institutions through out India. It is also recommended to conduct further multicentre studies including larger population sample for its global popularity the benefit of *Ardhavabhedaka* patients.

2. In order to assess the prevention a follow up study of at least 2 years is recommended.

3. Further study with large sample size in each group is recommended.

Various other combinations of *Pranayama* and *Pathyashadangam* can be studied.

Bibliography

- Adrevan Lysebeth.Yoga self thought, II Edn 1996 Vikas Publishing House Pvt. Ltd., Masjid Road, New Delhi 110014.
- Chunekar.K.C.Comentary on BavaprakashNigahntu, VEdn1979, Chowkhambaha Sanskrit Sansthan, Varanasi.
- Cristopher Kennard, Recent advances in clinical neurology, Number seven 1992, Chuchill Living stone.
- Eglilus.L.Hspierings, Management of Migraine, I Edn 1996, Butterworth, Heinemann, Boston.
- Glen.D.Solomon, Tegyulec and C.S.Solomon, Clinician'sManual on migrainel Edn.1997, Science Press Ltd.34-42 cleveland street, London.
- Gore.M.M.Anatomy and Physiology of Yogic practices.Mrs.B.B.Gore, Kanchan Prakash at and Post kaivalyadhama, Lonovala Pune, 410403.
- John N.Walton, Brains diseases of the Nervous system, VIII Edn 1977 Oxford Medical Publications.
- Kunjalal Kaviraj, Susrutha Samhitha English translation II Edn 1981 ChowkambhaSanskrit Series Office, Varanasi.
- Lajpat Raj.A.Physiological approach to Yoga, I Edn 1996 AnubhavRai Publishers JISM-AROG series 465/4 Ramnagar.
- Lakshmi Patti A.Ayurvedic encyclopedia 1959, 43 Harris Road, Mount Road Madras- 2.
- Lakshmi Patti Shastri., Yoga RatnakaraVidyodini teekha 1973 Chowkambha Sanskrit series Office, Varanasi-1.
- Mishra.S.P., Yoga and Ayurvedal Edn Chowkambha Orientalia Varanasi.
- Nishteshwar, K., A text book of Dravyaguna, I Edn 1988, A.P.Ayurvedic literature Improvement Trust, Hyderabad.

- Ninan T Mathew, Neurologic Clinics, Advances in headache volume 15 Number 1 February 1997 W.B.Saunders Company, London.
- Oliver Sacks, Migraine, 1985 University of California Press, Berkely and Los Angels California.
- Park.K., Text book of Preventive Medicine, 15th Edn 1997 M/s Banarsidas Bhanot 1167 Pramnagar Jabalpur.
- Ross Russel.R.W.Integrated clinical science- Neurology 1985, William Heinemann Medical Books Ltd., London.
- Shambunath Pandit, Stress management through Yoga and Meditation, I Edn1996.Sterling Publishers Pvt.Ltd., New Delhi.
- Shambunath Pandit, Speaking of Yoga A practical guide to better living, I Edn 1997 Sterling Publishers Pvt.Ltd., New Delhi.
- Singh H.G., Psychotherapy in India, I Edn 1997, National Psychological Corporation Publishers and distributers 4/230 Kanchanghat, Agra 282004.
- Srikantamoorthy, SarngadharaSamhitha English translation, I Edn 1984 Chowkambha Orientalia Varanasi.
- Srikantamoorthy, Ashtangahridayam English translation, I Edn 1991, Krishnadas Academy Post Box No.1118 Varanasi.
- Ted.A.Baumgartner, Clinton H.Strong, Conducting and reading research in health and human performance, 1994 Brown and Bench mark publishers U.S.A.

Appendix

Annexure - I

Cast sheet proforma

I Personal Data

1.	Name			7.	Income ₹ .....
2.	Age	..... years		8.	Social Status
3.	Sex	☐ M	☐ F	9.	O.P. No. .....
4.	Marital Status	☐ M	☐ U ☐ W	10.	I.P.No. .....
5.	Address			11.	D.O.A .....
6.	Occupation			12.	D.O.D .....

II Chief complaints with duration

1. Pricking pain in the two sides of temples
2. Feeling of hot fumes coming out from head
3. Feeling of pain at the eye/eyebrow
4. Pain in the *manya*/back side if neck
5. Excruciating pain of piercing or aching nature
6. Pain 0 unilateral/bilateral/diffused

III Associated Complaints

1.	Vomiting	2.	Nausea
3.	Intolerance to light	4.	Intolerance to sound
5.	Intolerance to smell	6.	Aura
7.	Blurring of vision	8.	Visual hallucinations
9.	Scintillating scotoma	10.	Heaviness of head
11.	Paresthesia	12.	Pallor
13.	Water Retention	14.	Mood Changes
15.	Giddiness	16.	Anorexia
17.	Profuse perspiration	18.	Loss of strength

19. Pulsations of blood vessels
20. Rigid and cold veins
21. Plucking pain in the eyes
22. Burning sensation in the eyes
23. Swelling of eye sockets
24. Running nose
25. Fever
26. Tinnitus
27. Itching inside the ears
28. Rigidity of lower jaw and shoulders
29. Stupor
30. Dryness of palate

IV History of Present Illness

1. Site of headache

☐ Unilateral ☐ Bilateral ☐ diffused

b) ☐ Temporal ☐ Frontal ☐ supra Orbital

☐ Parietal ☐ Occipital ☐ retro bulbar

☐ Post auricular ☐ malor ☐ cervical

☐ neck ☐ post occipital

2. Quality and nature of headache

☐ hammering ☐ throbbing ☐ pushing

3. ☐ Pressing ☐ dull ☐ boring ☐ bursting

☐ pricking ☐ rending ☐ stretching ☐ piercing

☐ splitting ☐ radiating

4. Time of onset

☐ day ☐ night ☐ persistent

☐ latter half of the day ☐ disturbed ☐ sleep

☐ night awakening ☐ rolonged reading.

5. Mode of onset

☐ gradual ☐ sudden

6. Duration of headache

..... minutes ☐ > 3 hrs.

7. Frequency of headache

☐ 10 days ☐ 15 days

☐ 30 days and above.

8. Age of onset

9. Past medication history

10. Aggravating factors

Ahara

☐ Melted butter ☐ fat meals ☐ spices ☐ hot buttered toast

☐ liquor ☐ malt ☐ missing meals.

Vihara

☐ exertion ☐ traveling ☐ head movements

☐ tension ☐ cough ☐ sneezing

☐ worse at night awakenings ☐ disturbed sleep.

Oushadha

☐ fomentation ☐ fumigation ☐ errhine emetics

☐ bloodletting.

11. Relieving factors

Ahara ☐ Tea ☐ coffee

Vihara

☐ sleeping in a dark room ☐ splinting of head in one position

☐ application of pressure or bandage ☐ pressure on affected arteries

☐ rest ☐ relaxation.

Oushadha

☐ oil massage ☐ fomentation ☐ cold applications

☐ hot packs ☐ mild sedatives

V History of past illness

VI Menstrual history

VII Family history

VIII Occupational history

☐ Executives ☐ clerical staff ☐ secretarial

☐ staff ☐ typing staff ☐ data processing staff

☐ messengers ☐ paper keepers ☐ business man

☐ office keepers senior management personnel

IX General Examination

1. General appearance
2. Mental status
3. Height
4. Weight
5. Nutritional status
6. Pulse rate
7. Blood pressure

X Systemic Examination

1. Nervous system
2. ENT Examination
3. Cardio Vascular system
4. Respiratory System
5. Alimentary system
6. Genito Urinary System

XI *Srotho pareekaha*

XII *Dasavidha pareeksha*

1. Dooshyam
2. Desam
3. Balam
4. Kalam

5. Analam
6. Prakrithi
7. Vaya
8. Satva
9. Satmya
10. Ahara

XIII *Ashtasthaana pareeksha*

- ☐ Nadee
- ☐ Malam
- ☐ Sabdam
- ☐ Drik
- ☐ Mootram
- ☐ Jihawa
- ☐ Sparsham
- ☐ Akrithi

XIV **Laboratory Investigations**

XV **Radiological Investigations**

XVI **Diagnosis**

XVII **Particulars of treatment**

XVIII **Result**

XIX **Advice**

XX **Compliance**

XXI **Follow up.**

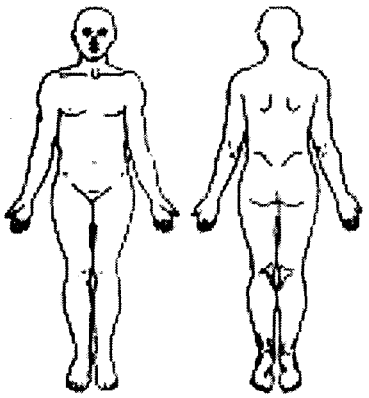
McGill Pain Questionnaire

Patient's Name _____ Date _____ Time _____ am/pm

PRI: S _____ A _____ E _____ M _____ PRI(T) _____ PPI _____
(1-10) (11-15) (16) (17-20) (1-20)

1 FLICKERING	11 TIRING	
QUIVERING	EXHAUSTING	
PULSING	12 SICKENING	
THROBBING	SUFFOCATING	
BEATING	13 FEARFUL	
POUNDING	FRIGHTFUL	
2 JUMPING	TERRIFYING	
FLASHING	14 PUNISHING	
SHOOTING	GRUELLING	
3 PRICKING	CRUEL	
BORING	VICIOUS	
DRILLING	KILLING	
STABBING	15 WRETCHED	
LANCINATING	BLINDING	
4 SHARP	16 ANNOYING	
CUTTING	TROUBLESOME	
LACERATING	MISERABLE	
5 PINCHING	INTENSE	
PRESSING	UNBEARABLE	
GNAWING	17 SPREADING	
CRAMPING	RADIATING	
CRUSHING	PENETRATING	
6 TUGGING	PIERCING	
PULLING	18 TIGHT	
WRENCHING	NUMB	
7 HOT	DRAWING	
BURNING	SQUEEZING	
SCALDING	TEARING	
SEARING	19 COOL	
8 TINGLING	COLD	
ITCHY	FREEZING	
SMARTING	20 NAGGING	
STINGING	NAUSEATING	
9 DULL	AGONIZING	
SORE	DREADFUL	
HURTING	TORTURING	
ACHING	PPI	
HEAVY	0 NO PAIN	
10 TENDER	1 MILD	
TAUT	2 DISCOMFORTING	
RASPING	3 DISTRESSING	
SPLITTING	4 HORRIBLE	
	5 EXCRUCIATING	

BRIEF	RHYTHMIC	CONTINUOUS
MOMENTARY	PERIODIC	STEADY
TRANSIENT	INTERMITTENT	CONSTANT



E = EXTERNAL
I = INTERNAL

COMMENTS:

Annexure - III

DIAGNOSTIC HEADACHE DIARY

Fill out diary every evening if there has been a headache at any time during the day. After each question put on (✓) in the box which is most appropriate.

Name : ..... Birthday : .....

Year : ..... Date : .....

When did the head ache begin	Indicate nearest hour	.....		
Just before the headache began, was there any disturbances of	Vision	☐	☐	☐
	Other Senses	☐	☐	☐
Was the headache	Right sided	☐	☐	☐
	Left sided	☐	☐	☐
	Both sided	☐	☐	☐
Was the headache	Pulsating / throbbing	☐	☐	☐
	Pressing / tightening	☐	☐	☐
Was the headache	Mild	☐	☐	☐
	Moderate	☐	☐	☐
	Severe	☐	☐	☐
Did the headache change with physical activity such as walking stairs?	Worse	☐	☐	☐
	Unchanged	☐	☐	☐
	Severe	☐	☐	☐
Did you suffer nausea?	No	☐	☐	☐
	Mild	☐	☐	☐
	Moderate	☐	☐	☐
	Severe	☐	☐	☐
Were you obtained by light?	No	☐	☐	☐
	Mildly	☐	☐	☐
	Moderately	☐	☐	☐
	Severely	☐	☐	☐
Were you bothered by sounds?	No	☐	☐	☐
	Mildly	☐	☐	☐
	Moderately	☐	☐	☐
	Severely	☐	☐	☐
Did anything provoke this attack	Specify	☐	☐	☐

Mild : Does not inhibit work performance or other activities
Moderate : Inhibits, but does not prohibit work performance and other activities
Severe : Prohibits work and other activities.

Annexure - IV

Pain assess with numerical scale, visual analogue scale and verbal analogue scale

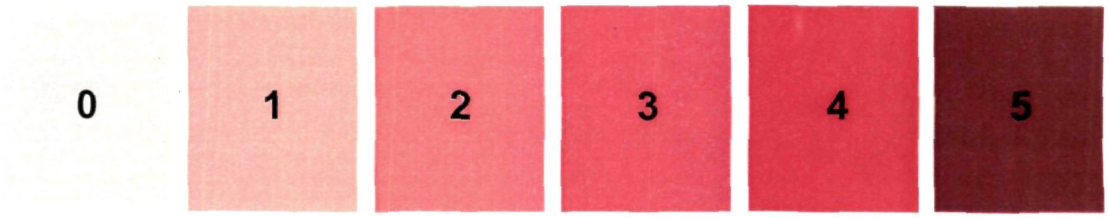
Pain assess with numerical scale, visual analogue scale and verbal analogue scale, etc.

For intensity of headache, a pain scale of 0 to 5 was utilized. The representation of the values were,

0 - not headache

1 - the minimal discomfort

5 - the most excruciating pain that the patient can imagine.



The intermittent values represented the intensities in between. For the sake of clarity of expression, a colour scheme, as given below, was also used as the best option available.

Even though a pain scale of 1 to 10 is advocated most often. If was found to differentiate the values in between 3 and 7 was a job for the participants. For e.g. they often failed to clearly indicate their head pains which fall between 5 and 6 or 6 and 7. So a more convenient scale of 0 to 5 was preferred.

In the of case of other features, a scale of 0 to 3 was adapted. Here the corresponding clinical picture was,

0	–	symptoms absent
1	–	mild symptoms
2	–	moderate symptoms
3	–	severe symptoms

This type of scoring is the one having wide usage and acceptance.

Using this method, all the participants were assessed and scores obtained were recorded.