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# ROLE OF GORAKHMUNDI (*SPHAERANTHUS INDICUS*) IN *ARDHAVABHEDAKA* W.S.R. TO MIGRAINE

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## ABSTRACT

Migraine is a result of various changes in our brain which become a cause for severe headache. It usually occurs due to sensitivity of light/ sound or smell. Approx 25% of people over whole population is suffering from migraine. It can be predicted that after adolescent stage, the ratio of migraine between male and female is 1:3. Pain in half of the head is defined as *Ardhavabhedaka* in *ayurveda*. Migraine can be compared with this disease. *Acharya Charak* and *Sushrut* have given description about migraine as a separate diagnostic unit although *Acharya Vagbhatt* has included this disease in *vataja shiro roga*. Treatment of *Ardhavabhedaka* can be done by yoga, *panchakarma* and some herbal drugs. *Gorakhmundi* (*Sphaeranthus indicus*) is one among them which plays great role in treatment of migraine.

**KEYWORDS:** Migraine, *Ayurveda, ardhavabhedaka, Sphaeranthus indicus,* Pharmacological activities, Traditional Uses.

## INTRODUCTION

The most common categories of migraine headache are those without aura (previously known as common migraines) and those with aura (previously known as classic migraines). Common migraine has no "aura." About 80% of migraines are common. Classic migraines (migraine with aura) present with an aura before the headache and are more severe than common migraines. Other types of headaches can also cause intense pain, and not

all headaches are migraines. For example, some describes the pain of cluster headaches as the worst pain they have experienced. Sinus headaches can also cause pain and inflammation. The causes of migraines are not known. Changes in neurotransmitter levels within the brain are thought to play a role.[1]

A migraine is a primary headache disorder characterized by the recurrent headaches that are moderate to severe. Typically, the headaches affect one half of the head, are pulsating in nature, and last from two to 72 hours.[2]

Migraines are believed to be due to a mixture of environmental and genetic factors. About two-thirds of cases run in families. Changing hormone levels may also play a role; the risk of migraines usually decreases during pregnancy.[3] Migraine is a neurological disease with extremely incapacitating neurological symptoms. About 25% of migraine sufferers also have a visual disturbance called an aura, which usually lasts less than an hour. In 15-20% of attacks, other neurological symptoms occur before the actual headache.[4]

**Triggering factors**

• Allergic reactions.
• Bright lights, loud noises, and certain odours or perfumes.
• Physical or emotional stress.
• Changes in sleep patterns.
• Smoking or exposure to smoke.
• Skipping meals.
• Alcohol or caffeine.
• Menstrual cycle fluctuations, birth control pills.
• Tension headaches.

**Pathophysiology of Migraine**

Migraines are believed to be a neurovascular disorder with evidence supporting its mechanisms starting within the brain and then spreading to the blood vessels. Some researchers believe that neuronal mechanisms play a greater role, while others believe blood vessels play the key role. Others believe both are likely important.

One theory is related to increased excitability of the cerebral cortex and abnormal control of pain neurons in the trigeminal nucleus of the brainstem. Low levels of the

neurotransmitter serotonin, also known as 5-hydroxytryptamine, are believed to be involved.[5]

Once considered exclusively a disorder of blood vessels, compelling evidence has led to the realization that migraine represents a highly choreographed interaction between major inputs from both the peripheral and central nervous systems, with the trigeminovascular system and the cerebral cortex among the main players. Advances in in-vivo and in vitro technologies have informed us about the significance to migraine of events such as cortical spreading depression and activation of the trigeminovascular system and its constituent neuropeptides, as well as about the importance of neuronal and glial ion channels and transporters that contribute to the putative cortical excitatory/inhibitory imbalance that renders migraineurs susceptible to an attack.

A series of laboratory experiments in the 1990s suggested that migraine pain may be due to a sterile neurogenically driven inflammation of the dura mater. Plasma extravasation can be blocked by ergot alkaloids, indomethacin, acetylsalicylic acid and the serotonin-5HT1B/1D agonist, sumatriptan. Furthermore, preclinical studies have suggested that cortical spreading depression may be a sufficient stimulus to activate the trigeminal neurons, although this has been a controversial area.[6]

In addition, there are structural changes in the dura mater that are observed after trigeminal ganglion stimulation. These include mast cell degranulation and changes in the postcapillary venules, including platelet aggregation.

It is generally thought that local vasodilatation of intracranial extracerebral blood vessels and a consequent stimulation of surrounding trigeminal sensory nervous pain pathways is a key mechanism underlying the generation of headache pain associated with migraine. This activation of the ‘trigeminovascular system’ is thought to cause the release of vasoactive sensory neuropeptides, especially CGRP, that increase the pain response. The activated trigeminal nerves convey nociceptive information to central neurons in the brain stem trigeminal sensory nuclei that in turn relay the pain signals to higher centers where headache pain is perceived. It has been hypothesized that these central neurons may become sensitized as a migraine attack progresses.

**Ayurvedic view**

*Acharya Charaka* explains it as either *vata* or *vatha kaphaja* in origin. In *Charaka Samhita Ardhavebhedaka is* described in *Siddhi sthanam* chapter number nine. *Vata* and *kapha* are most common cause of *ardhavabhedaka* (migraine) according to *Achraya Charaka. Vata* vitiated due to intake of rough food, over eating, eating during indigestion, exposure to easterly wind and dews, excessive coitus, suppression of urges, exertion and physical exercise singly or accompanied by *Kapha* seizes the half of the carotid region, eyebrow, temple, ear, eye and forehead. This is *Ardhavabhedaka*. If far advanced, it may destroy the sight and the hearing.[7]

In *Sushrut Samhita Ardhavabhedaka* (migraine) is described in *Uttaratantra* chapter number twenty five. According to *Sushruta* whose half of the head had severe pain such as splitting, picking, churning etc appearing in bouts of (intervals of) either or fifteen or ten days and without any known cause. This disease is known as *Ardhavabhedaka* (migraine). *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*.[8]

The deranged function of *tridoshas* 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 *samprapti* of *vatha kapha* 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*.

**Nidan**

- *Ruksha sevana*- taking dry foods.
- *Adhyasana*- consuming food immediately before the digestion of previous food.
- *Poorva vata*- exposure to direct breeze.
- *Avasyaya*- exposure to cold or dew.
- *Vega dharana*- suppression of natural urges.
- *Ati vyayama and ayasa*- over exertion etc.

• *Dhoom sevana*- exposure to smoke.
• *Atapa and tushara sevana*- hot and cold climates.
• *Ambu kreeda*- swimming and water games.
• *Atiswapna*- excessive or continuous sleep.
• *Atijagarana*- night arousals.
• *Vashpa nigraha*- suppressing tears.
• *Rodana*- weeping.
• *Madyapana*- drinking excess alcohol.
• *Krimi*- presence of worms.
• *Asatmya gandha*- unaccustomed smells.

**Ayurvedic Treatment**

The healing science of Ayurveda opens new doors for treatment of migraine and other type of headaches. Ayurveda uses different modalities such as nutrition, lifestyle modifications, herbs, *panchakarma*, yoga, meditation, relaxation techniques, pranayama (breathing exercises), aromatherapy, *marma* points to help treat migraine headaches. These treatment approaches create a balanced physiology. This state of complete balance in healing the body and mind can allow the illness to resolve and symptoms to disappear. A mixture of herbal essential oils can help to alleviate headache. Peppermint essential oil in massage oils and balm can help with migraine.

Pranayama (breathing exercises): Different types of breathing exercises have different effects on the body, mind and spirit. One can benefit from alternate nostril breathing (*Anuloma Viloma*).

**Soothing nose drops *(Nasya):*** Putting about 5 drops of *brahmi ghee* in each nostril can alleviate the pain of migraine headache. In *vata*-type headaches, placing 3-5 drops of warm *ghee* in each nostril can help to calm down the headache.

Ayurveda, the oldest traditional system of India, reveals that ancient Indians had a rich knowledge of medicinal value of different plants.[9] Many herbs and ayurved therapy are used for migraine treatment. Describe in our *Samhita Mundi* [*Sphaeranthus indicus Linn.*] is mostly used for treatment of *Ardhavabhedaka* [migraine].

***Sphaerathus Indicus [Ardhavabhedaka]***

Taxonomic Classification

- Kingdom: Plantae
- Subkingdom: Viridaeplantae
- Phyllum: Tracheophyte
- Subphyllum: Euphyllophytina
- Infraphyllum: Radiatopses
- Class: Magnoliopsida
- Subclass: Asteridae
- Superorder: Asteranae
- Order: Asterales
- Family: Asteraceae
- Genus: Sphaeranthus
- Species: indicus

**Pharmacodyanemic Properties**

*Rasa* (Taste) - *Tikta* (Bitter), *Katu* (Pungent)

*Guna* (Qualities) - *Laghu* (Light for digestion*), Ruksha* (Dry in nature)

*Vipaka* - *Katu* (Undergoes Pungent taste after digestion)

*Veerya* (Potency) - *Ushna* (Hot)

*Karma* (Actions) - *Tridosha shamaka* (reduces al the three *doshas*), *Rasayana* (acts like health tonic).[10]

**Distribution**

*Mundi* grows in rice fields after the crop is harvested. *Sphaeranthus indicus* is a plant distributed throughout the plains and wet lands in India, Sri Lanka and Australia.

**Botanical Description**

The shrub grows 15 – 30 cm high and is scented. Leaves: Round and composite without stalk and hairy like velvet, 3 – 6 cm long, oblong shaped. Flower: Stalk 12 – 18 cm long, bears round inflorescence of violet colour. Flowering occurs in winter followed by fruiting. One of the varieties called *mahashravani or mahamundi*.

**Chemical composition of *Sphaeranthus indicus***

Stems, leaves and flowers have been found to contain fatty acids, phytosterols, a glycoside composed of the alkaloid sphaeranthine and a polysaccharide, β-sitosterol, n-pentacosane, n-triacontanol, stigmasterol, hentri-acontane and β-D-glucoside of β-sitosterol. Flowers also contain a number of eudesmanolides and sesquiterpene lactones, viz., hydroxy-, dihydroxy- and methoxy frullanolides. Stems, leaves and flowers contain essential oil composed of methyl chavicol, α-ionone, d-cadinene, p-methoxycinnamaldehyde as major constituents and α-terpinene, citral, geraniol, geranyl acetate, β-ionone, sphaerene, indicusene and sphaeranthol α-cadenine, ocimene as minor constituents. β-Sitosterol, n-triacontanol, phenylurethan, n-pentacosane have also been isolated from.[11]

**Ayurvedic Preparations**

*Mundi Churna, Mundi panchang swarasa, Mundi kwatha.*

**Benefit of *Gorakhmundi* [*Sphaeranthus indicus*] in migraine**

The whole plant is used for formulation of medicine. *Mundi* is used in ayurvedic treatment of pain, localized swelling, headache, indigestion, epilepsy, mental illness and skin disorder. *Gorakhmundi* Powder of Planet Ayurveda has got plenty of health benefits and uses. It is believed that *Gorakhmundi* powder acts as very good blood purifier to remove toxins from the body. It reduces increased uric acid, urea and creatinine level and fight against various ailments.

*Acharya shodala describes* that The fresh juice of *sphaeranthus indicus* is given with balck papper powder in dose of 10-15 ml for seven days before food to treat headache including cases of [*Ardhavebhedka*] migraine.[12] It works like nervine tonic.[13]

Mix *Gorakhmundi* powder, ghee; honey is prescribed in the diseases related to *vata*. Also prescribed powder of *Gorakhmundi* and *Saunth* (Ginger) with equal quantity in hot water to removes the pain of common *vata.*

**DISCUSSION**

**Mode of Action according to Ayurved**

*Mundi* is *vata* and *kapha shamak* due to its *ushna veerya*. It is brain tonic as well as nervine tonic too. It strengthens the nerve and improves the function of nerve. It reduces the *vata dosha* in body which relieves the pain of *Ardhavabhedaka*. It is also found as a good blood

purifier so that it has been proved as a good pain reliever in *Ardhavabhedaka*. It also reduced all types of swelling in our head.

**Mode of Action according to Modern**

Study reveals that Petroleum ether, benzene, chloroform, ethanol and triple distilled water extracts of whole plant of *S. indicus*, obtained by successive solvent extraction, were screened for analgesic and antipyretic activity (200 and 400 mg/kg, p.o.) using Eddy's hot plate, tail immersion and brewer's yeast induced pyrexia methods, respectively. The petroleum ether, chloroform and ethanol extracts showed significant analgesic activity at both the doses from 1 hour onward as compared to the standard drug diclofenac sodium. The chloroform and ethanol extracts showed potential significant antipyretic activity from 1 hour onward, whereas aqueous extracts exhibited this activity from 2 hours onward as compared to the standard drug paracetamol amongst various extracts.[14] Neuroleptic and anxiolytic activity has been reported for flowers of this plant. These reported activities confirm that the herb of *S. indicus* is able to modulate the physiology of the central nervous system. The hydroalcoholic extract of *S. indicus* was seen to increase immobility time and decrease peripheral square movements; the observed decrease in central square movements could be due to impairment with locomotor activity.[15] The extract (50 and 100 mg/kg p.o.) produced reduction in spontaneous motor activity, exploratory behaviour and motor coordination and prolonged pentobarbital sleeping time. Hydroalcoholic extract decreased locomotor activity but did not affect emotional activity parameters in the open field test, suggesting a possible central nervous depressant activity. Hydroalcoholic extract also increased the immobility time in the forced swimming test at an oral dose of 500 mg/kg but did not significantly modify the activity in the tail suspension test. Hydroalcoholic extract protected rats against MES-induced convulsions and mice against PTZ-induced convulsions.[16]

The ethanol extracts of the whole plant *S. indicus Linn*. exhibited dose dependent analgesic activity with 66.6 and 67.4% of protection Malairajan et al., 2012 leaves (ethanolic) The ethanolic extract *S. indicus* in different doses (100,200, and 400mg/kg, p.o) exhibited dose dependent and significant analgesic activity in both models of pain.

## CONCLUSION

*Ayurvedic nighantus* have broadly mentioned mundi in the treatment of different ailments of human being. The pharmacological studies reported in this review confirm the therapeutic value of *S. indicus* Linn. The current study describes that flower of *S. indicus* has significant

anti-inflammatory and analgesic properties. Conclusion of the study is that mundi can be used as an alternative therapy for the treatment of minor to moderate types as a painkiller. Due to *vata* and *kaphanashak* property *mundi* can be use in a broad-spectrum.

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