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NASYA IN AYURVEDA: AN IN-DEPTH ANALYSIS OF ITS MECHANISMS

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ABSTRACT: *Nasya*, one of the core detoxification therapies in Ayurveda, involves the administration of medicinal substances through the nasal passage. It is particularly effective for disorders affecting the head and neck region (above the clavicle), but it also influences the nervous and endocrine systems systemically. In Ayurveda, the nasal cavity (*Nasa*) is seen as a direct pathway to the brain (*Shiras*), allowing medicines to reach the brain and affect neurological, endocrine, and circulatory functions. Modern medicine also recognizes the nasal route for its potential in both local and systemic treatment outcomes. This study explores the mechanisms of *Nasya* through both Ayurvedic and modern scientific lenses.

INTRODUCTION: The word *Nasya* is derived from "*Nasa" Dhatu*, which conveys meaning of *'Gati'*. Here the *Gati* is towards the internal structures mainly to head through nose. It is also called as *Shirovirechana* that implies removal of toxins from the head region. *Nasya* Karma is a fundamental therapeutic approach in Ayurveda, focusing on treating conditions in the head and neck region. As a significant part of *Panchakarma* therapy, it involves delivering medicinal substances through the nostrils. The nasal route is highly effective due to its direct connection to the brain and the rich blood supply that facilitates quick absorption and systemic distribution. While *Nasya* has been practiced in Ayurveda for centuries, modern medicine is beginning to appreciate the benefits of intranasal drug delivery for similar therapeutic reasons.

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The nasal passage, with its extensive surface area and proximity to the brain, provides an efficient route for drug delivery, bypassing the liver's first-pass metabolism and ensuring rapid therapeutic effects. *Nasya* targets disorders in the head and neck region but also has widespread effects throughout the body, particularly influencing the nervous and endocrine systems. To fully understand the mechanisms of *Nasya*, it is essential to delve into the anatomical and physiological characteristics of the nasal cavity and its connections to the brain.

***Shiras* (Head):** The head (*Shiras*) is considered *Uttamanga*, the supreme, important, and major part of the body, where life and the sense faculties reside [1]. *Aacharya Vagbhatta* compares the human body to a tree with its roots at the top and branches at the bottom, describing the head as the site where all sense organs and Prana (vital force) reside [2]. All the *Indriyas* (sense organs), *Indriyavahi* (sensory channels), and *Pranavaha Srotas* (channels carrying vital impulses) depend on the *Shiras* for their functions. The sensory and vital impulses from the *Shiras* are like rays from the sun[3], extending throughout the body.

***Nasa* (Nose):** The nose (Nasa) is classified among the five sensory organs (Panchagyanendriya) in Ayurveda and is primarily associated with the sense of smell (*Ghranendriya*).

However, its functions extend beyond olfaction and respiration, serving as a crucial route for administering medicinal substances in *Nasya* therapy.

Physiology of the Nasal Tract: The nasal tract, extending from the nasal vestibule to the nasopharynx, plays a significant role in drug absorption. Its large surface area, high vascularity, and protective mucus lining make it an ideal route for drug administration. The nasal tract is divided into three main regions:

1. **Vestibular Region:** Located at the entrance of the nasal passage, this region filters incoming air and plays a minimal role in drug absorption.
2. **Respiratory Region:** This region is responsible for systemic drug absorption due to its rich blood supply and extensive surface area.
3. **Olfactory Region:** With its direct connection to the brain, this region is key in drug transport to the brain and cerebrospinal fluid (CSF).

Definition of Nasya: Nasya involves the administration of medicinal substances through the nasal passage to treat disorders located in the head and neck region [4]. Here is the paraphrased information in table form:

TABLE 1: CLASSIFICATION OF *NASYA* ACCORDING TO VARIOUS *ACHARYAS*

Sr. no.	Name of *Acharyas*	No	Classification	Reference
1	*Acharya Charaka*	3	According to mode of action-*Rechana, Tarpana, Shamana*	*Ch.Si*.9/92
		5	According to the method of administration - *Navana, Avapidana, Dhmapana, Dhuma, Pratimarsha*	*Ch.Si*.9/89 *Ch.Vi*.8/151
		7	According to various parts of drugs utilized - *Phala, Patra, Mula, Kanda, Pushpa, Niryasa, Twaka*	
2	*Acharya, Sushruta*	5	*Shirovirechana, Pradhamana, Avapida, Nasya, Pratimarsha*	*Su.Chi*.40/21
3	*Acharya, Vagbhata*	3	*Virechana, Brimhana, Shamana*	*A.H.Su*.20/2
4	*Acharya, Kashyap*	2	*Shodhana, Poorana*	*Ka.Si*.4/3
5	*Acharya, Sharangdhara*	2	*Rechana, Snehana*	*Sha.S.U*.8/2,11,24

***Nasya Pranidhana Kala*:** According to *Acharya* Charak, Nasya can be given in *Pravrita, Sharad* & *Vasanta Ritu*. But it can be administered in any *Ritu* at time of emergency.

ACCORDING TO *RITU*

Season	***Pranidhana Kala***
Grishma Ritu	*Purvahana*
Shita Ritu (Shishira & Hemanta)	*Madhyahana*
Varsha Ritu	*Adurdine Kala* (clearsky)

ACCORDING TO *DOSHA*

Dosha	***Pranidhana kala***
Vataj Roga	*Aprahana*
Pittaj Roga	*Madhyahana*
Kaphaja Roga	*Purvahana*

NASYA MATRA

S. no.	Types of *Nasya*	***Heen Matra***	***Madhyam Matra***	***Uttam Matra***
1	*Shodhana*	8 *Bindu* (4 *Bindu* in each nostril)	12 *Bindu* (6*Bindu* in each nostril)	16 *Bindu* (8 *Bindu* in each nostril)
2	*Shamana*	16 *Bindu* (8 *Bindu* in each nostril)	32 *Bindu* (16*Bindu* in each nostril)	64 *Bindu* (32 *Bindu* in each nostril)
3	*Avpida*	4 *Bindu* in each nostril	6 *Bindu* in each nostril	8 *Bindu* in each nostril
4	*Marsha*	6 *Bindu* in each nostril	8 *Bindu* ineach nostril	10 *Bindu* in each nostril
5	*Pratimarsha*	2 *Bindu* in each nostril	2 *Bindu* ineach nostril	2 *Bindu* in each nostril
6	*Dhumapana*	3 *Muchuti*	3 *Muchuti*	3 *Muchuti*

Ayurvedic Perspective on the Mechanism of *Nasya*: In Ayurveda, Nasya is considered the most effective therapy for addressing imbalances in the head and neck region [5]. The nasal passage is viewed as a gateway to the brain, allowing medicines administered through the nose to reach the brain and influence higher brain centers that control neurological and endocrine functions [6]. This process, known as *Shirovirechana*, refers to the cleansing of the head region. *Aacharya Charaka* emphasizes that the nose provides a direct pathway to the brain, enabling medicines administered nasally to reach the brain and remove only the morbid doshas responsible for disease. This understanding is supported by *Aacharya Sushruta's* anatomical descriptions, which highlight the close relationship between the nasal passage and the brain, especially in cases of excessive *Nasya* [7] leading to the discharge of brain matter (CSF) through the nose. In *Ashtanga Samgraha*, it is explained that medicinal substances administered through the nostrils travel to the brain via the nasal channels, spreading through the eyes, ears, throat, and blood vessels. The medicine then scrapes away the morbid doshas in the head and neck region [8], eliminating them from the body. This process is facilitated by the *Shringataka Marma*, a vital point in the brain connected to the nasal, auditory, visual, and oral regions [9].

Modern Perspective on the Mechanism of *Nasya:* Modern science recognizes the nasal route as an effective means of drug delivery due to its high vascularity and proximity to the brain. The nasal epithelium allows for rapid absorption of medicinal substances into the systemic circulation, bypassing the liver's first-pass metabolism and ensuring quick onset of therapeutic effects. This route also enables direct drug delivery to the central nervous system (CNS), bypassing the blood-brain barrier (BBB) [10].

Pharmacodynamics of Nasya:

Vascular Pathway: The nasal mucosa is highly vascularized, allowing for efficient systemic absorption of drugs. The rich blood supply ensures that medicines administered nasally quickly reach therapeutic levels in the bloodstream [11].

Neurological Pathway: The olfactory nerve connects directly with the limbic system and hypothalamus, which regulate endocrine secretions. Medicines administered through *Nasya* may stimulate these brain centers, influencing both the nervous and endocrine systems [12].

Diffusion through Nasal Mucosa: The absorption of drugs through the nasal cavity involves their passage through the protective mucus layer. Smaller, uncharged particles are absorbed more easily, either through the paracellular route (a slow, passive process) or the transcellular process (a more rapid, lipid-mediated process) [13].

Advantages of Nasal Drug Delivery:

- ❖ Avoidance of first-pass metabolism by the liver.
- ❖ Rapid onset of therapeutic action.
- ❖ Higher bioavailability and quicker absorption.
- ❖ Non-invasive and convenient for the patient.

Limitations of Nasal Drug Delivery:

- ♦ Potential for local irritation and damage to the nasal cilia.
- ♦ Risk of mechanical loss of medication into the lungs or other parts of the respiratory tract if not administered properly.

DISCUSSION: *Nasya* is a well-established Ayurvedic therapy used for treating head and neck disorders by administering medicinal substances through the nasal passage. Ayurveda views the nose as a direct gateway to the brain, allowing medicines to reach the brain and eliminate toxins that cause imbalances in the head region. This approach, known as *Shirovirechana* (cleansing of the head), is particularly effective in balancing the *Vata*, *Pitta*, and *Kapha Doshas*, which contribute to diseases above the clavicle.

Modern science supports the nasal route as an effective method for drug delivery due to the nasal mucosa's rich vascularity and direct connection to the brain. Medicines administered nasally bypass the liver's first-pass metabolism and the blood-brain barrier (BBB), allowing for rapid absorption and a quicker therapeutic effect. This makes *Nasya* a valuable therapy, especially for conditions

involving the nervous and endocrine systems. While the nasal route offers advantages such as avoiding liver metabolism and providing rapid therapeutic action, potential challenges like nasal irritation and mechanical loss of medication must be managed for broader clinical application.

TABLE 2: BOTH AYURVEDA AND MODERN PATHWAY OF EXPLAINING MODE OF ACTION OF NASYA HAS CERTAIN SIMILARITIES [14]

Pharmacokinetics	Ayurvedic comparison
Drug absorption pathways Receptor cells in the olfactory mucosa Sensory receptors of the trigeminal nerve Cavernous sinus Circulation of drug Pathway of drug action	Associated with the *Sringhataka Marma*
Neuronal pathway Olfactory (b) Trigeminal	*Prana*

CONCLUSION: *Nasya* is a time-proven Ayurvedic therapy that balances the *Doshas* and effectively treats disorders of the head and neck. It works by delivering medicines directly to the brain, influencing the nervous and endocrine systems.

Modern science validates the nasal route for its ability to bypass traditional barriers like the BBB and liver metabolism, making it a fast and efficient method for drug delivery. Integrating traditional *Nasya* practices with modern scientific knowledge can enhance its clinical applications and patient outcomes, making it a promising therapy for both local and systemic health conditions.

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