

REVIEW ON PHARMACO-DYNAMICS OF NASYA

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ABSTRACT

Nose is an organ of olfaction and plays its vital part in respiratory system, but there is one more distinct and salient feature which makes it a very special by virtue of its connection with the brain, not anatomically but pharmacodynamically. Thus *Ayurveda* scholars have mentioned 'nasa hi shiraso dvaram' i.e. nose is gate way to head. Contemporary medicine also acknowledges that intranasal drug therapy was an essential contribution of *Ayurveda* science to the medical field. The different forms of *Nasya* e.g. *churna* (powder), *sneha* (unctuous substance), *kvatha* (decoction) *e.t.c.* acts through diverse mechanisms i.e. vascular and neural path in the body. Nasal drug absorption mainly depends on the physiological conditions of the nose and also physicochemical properties of drugs. *Ayurveda* scholars have considered the various factors which influence the nasal drug absorption and accordingly have detailed the procedure of *Nasya* for maximum absorption of nasal drug. Standardization of the *Nasya* with *Ayurveda* and modern scientific parlance is the need of the hour, and then only we would be able to do proper justification to this unique and noble treatment.

Keywords: *Nasya*, Pharmacodynamics, Nasal drug absorption.

INTRODUCTION

Nasya is a therapeutic procedure, wherein the appropriate drugs either in the form of *sneha* (unctuous substance), decoction, powder, processed milk, juice or medicated fumes are administered through the nose in a specific manner to cure various systemic diseases. It is completely different from ordinary intranasal medication with regards to mode of administration and contents. Contemporary science have done thorough research on intranasal therapy and have concluded that the intranasal therapy is sometimes alternative or even superior to intravenous route of drug delivery system, which perhaps explains why intravenous route of drug delivery is not found in any of the *ayurveda* texts.. *ayurveda* has given importance to the *shi-*

ras, considering it as a *uttam ga*^[1], and seat of *pr na* i.e. life.

an may yath m l vrk a samyakpravardh at /

an may irasy va d ha samyakpavardh at //^[2]

The state of equilibrium of the body depends upon the *Shiras* is compared to a root of a tree.

irasiindriy iindriyapr avah nicasr t sis ryamivagabhastaya sa rit ni ||^[3]

The channels carrying senses in the human body are directly connected to *shiras* (head) just like the sunrays are connected to the sun.

ETYMOLOGY OF NASYA

The derivation of the word *nasya* is from "nasa" *dh tu*. It conveys the sense of *gati*

– motion. Here, the *nasa dh tu* is inferred in sense of nose. “*nasta*” means beneficial for nose^[4].

DEFINITION OF NASYA

The therapeutic procedure of instilling medicines in to the nose is termed as *nasya karma*.^[5]

CLASSIFICATION OF NASYA KARMA:

TYPES	CLASSIFICATION
2[6]	<i>Br ha , Kar a</i>
2[7]	<i>Rechana, Snehana</i>
2[8]	<i>Pr yogika, Snaihika</i>
2[8]	<i>Sa~gy prabodhaka, Stambhana,</i>
3[9]	<i>Virechana, Br ha , Shaman</i>
3[10]	<i>Rechana, Tarpa , Shamana</i>
5[11]	<i>Shirovirechana, Pradhamana, Avap a And Pratimarsha</i>
5[12]	<i>N vana, Avap ana, Dh m pana, Dh ma, Pratimarsha</i>
7[13]	<i>Phala, Patra, M la, K n a, Pu pa, Niry sa, Twaka</i>

RE - CLASSIFICATION OF NASYA ACCORDING TO ITS KARMA:

- 1) **Shodhan:** a) *Dh ma*; b) *Sneha: Marsha & Pratimarsha*; c) *Avap a (Sa~gy prabodhaka)*; d) *Pradhamana*
- 2) **Shamana:** a) *Sneha: Marsha & pratimarsha*; b) *Avap a (Stambhak)*
- 3) **Br ha :** a) *Sneha: Marsha & Pratimarsha*; b) *Dh ma*

MODE OF ACTION OF NASYA KARMA: The pharmacodynamics of *nasya* can be explained better by taking into consideration both *ayurvedic* and contemporary references as follows:

Mucosal absorption of intranasal drug: Mucosal absorption is the first step for the intranasal drugs. The nasal mucus layer is only 5 µm thick and it is organized in two distinct layers: an external, viscous and dense, and an internal, fluid and serous [14]. Mechanisms for absorption through the nasal mucosa include para-cellular transport via movement between cell and trans-cellular or simple diffusion across the membrane.

Nasya is classified in various ways by different *ayurveda* scholars. Each classification has its own salient features and each is done with different angles. Classification according to various *ayurveda* scholars is described in a table no.1

Table no.1 of Classification of nasya according to various authors

1. The first mechanism includes aqueous route of transport, which is also called as the para-cellular route. This is slow and passive route.
2. Trans-cellular process is the second mechanism of transport through a lipoidal route and is responsible for the transport of lipophilic drugs that show a rate dependency on their lipophilicity. Drugs also cross cell membranes by an active transport route via carrier-mediated means or transport through the opening of tight junctions. Therefore *n vana nasya* which is form of *sneha nasya* has mentioned as the best amongst all *nasya* types as the olfactory mucosa has affinity towards lipophilic nature of *sneha* and can easily and rapidly gets absorbed. The drug then show its action either by passing into blood circulation through vascular path way or stimulating the nerve endings in the mucosal layer. [15] After getting absorbed into the mucosa the drug may take the vascular path or the neural path to show its action.

A. Vascular Path: Vasculature of the nasal cavity is richly supplied with blood to fulfill the basic functions such as heating and humidification, olfaction mucociliary clearance and immunological functions. The medicines administered through *nasya* gets absorbed into the superior olfactory veins and then move to the facial vein. Interestingly, both facial and ophthalmic veins have no venal valves in between. So that, blood may drain on either side, that is to say the blood from facial vein can enter cavernous venous sinus of the brain in reverse direction. Thus, such a pooling of blood from nasal veins to cavernous sinus (which can be compared to *shringsh ak marma*, a *sir marma* located at the centre of the head) [16] and then surpassing the blood brain barrier can reach the brain and cerebrospinal.

B. Neural path: Channels carrying the senses from the sense organs to the head are compared to sunrays and thus signify olfactory and trigeminal nerves. These nerves are chemoreceptor and connected to higher centers of brain and thus may regulate the body's behavior, emotions, circadian rhythm, consciousness etc. Intranasal route has promising approach for delivery of drugs to the brain. The delivery of drugs to the CNS from the nasal route may occur via olfactory neuroepithelium. The transport via trigeminal nerve system from the nasal cavity to CNS has also been described. Drug delivery through nasal route into CNS has been reported for Alzheimer's disease, brain tumors, epilepsy, migraine and sleep disorders.

FACTORS INFLUENCING NASAL DRUG ABSORPTION [17]

1. Blood flow: Rich supply of blood and a large surface area make the nasal mucosa an optimal location for drug absorption. *Sa~kuchita anga* decreases proper absorption of drug into *dhamanis* [18].

Nasal absorption of drugs is influenced by blood flow rate, as it increases the amount of drug that passes through the membrane and hence reaching the general circulation. Therefore proper *snehan* and *svedan* are required for causing vasodilatation increasing blood supply around nose for better absorption.

2. Position: Position of the patients matters a lot during instillation of the *nasya*. Head Low position with slight elevation of the legs helps in medicine to reach deep inside olfactory mucosa and facilitates absorption [19].

3. Physiochemical properties of drug:

A. Lipophilicity: lipophilic drugs have better absorptive capacity, therefore *br ha nasya* is in the form of *sneha nasya* whereas non-absorptive / stimulant / secretive [20] *nasya* are in the form of powder or decoction.

B. Viscosity: Formulation with higher viscosity increases the absorption of the drug by increasing the contact time to the nasal mucosa (*viryam y vatadhiv sat nip tatcha* [21]). The absorption of the *sneha nasya* is further supplemented by its viscous nature.

C. PH [22]: pH of the drug plays important role in absorption of drug through nasal route. The pH of formulation should be near to human nasal mucosa (5.0-6.5) e.g. as that of *sneha nasya* to prevent the sneezing and for better absorption.

4. Nasal secretions: Normal nasal secretions everyday range between 0.5 – 1.5ml. Hence to decrease nasal secretions *Pr yogika dh map n* is mentioned in *p rvakarma* which dries up the secretions and increases [23] the absorption. Nasal secretions are increased in night and therefore *nasya* is contraindicated in night.

5. Volume: Quantity of the *nasya* is mentioned in *bindupram na* in *Yurveda* texts *bindu* is the unit of measurement and defined as the net quantity of *drava* that dribbles down when the first two parts of index finger are immersed in the liquid should be considered as one *bindu* [24]. Thus one *bindu* will be 0.5ml and therefore quantity of *a utaila* for example will be 48 *bindus* i.e. 24ml, which is almost identical to the quantity of 25 ml described in contemporary medicine [25]. Different quantities of *nasya* are mentioned by *Yurveda* scholar's needs to be standardized by conducting more research.

CONCLUSION

The mode of action of *nasya karma* mentioned by *Yurveda* scholar's thousands of years ago can be demonstrated even in the present era with the help of modern scientific parameters. The different forms of *nasya* e.g. *churna*, *sneha*, *kv tha* e.t.c. acts through diverse mechanisms i.e. vascular and neural, in the body. Nasal drug absorption mainly depends on the physiological conditions of the nose and also physico-chemical properties of drugs. *Yurveda* scholars have considered the various factors which influence the nasal drug absorption and accordingly have detailed the *nasya vidhi* for maximum absorption of nasal drug. Standardization of the *nasya karma* with *Yurveda* and Modern scientific parlance is the need of the hour, and then only we would be able to do proper justification to this unique and noble treatment.

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