

# *Nasa Hi Sirso Dwaram* - A comparative scientific study

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## Abstract

The development of alternative methods of drug administration has improved the ability of physicians to manage specific problems. The nasal route of administration has been used for different therapeutic and prophylactic purposes for millennia. The drugs, which are administered through the nose, act locally as well as systemically. The dose of drugs required is very minimal. The metabolism of the drug is not required through first passage and the action of the drug is faster and effective. In *Ayurveda*, special procedure called *Nasya* has been mentioned. *Nasa* is indirectly connected with the cranial cavity. Perfect balance of oxygen levels in the body can be attained with *Nasya Karma*, thereby also clearing all the morbid *Doshas*.

**Keywords :** *nasa, dosha, nasya, cranial*

## Introduction

The literary meaning of the word '*Nasya*' is nose or all the things which are beneficial to the nose. Nose is an important drug delivery route. In Ayurvedic literature there are so many diseases which are mentioned in text that are treated by *nasya karma* but there is no scientific or clinical evidence behind these studies. But today's era is for validation of science and experimental ground. There are various references and studies which were done on this nasal route which proves that nasal passage is very important for drug delivery, for localised as well as systemic circulation.

## Discussion

### Nasya Karma

#### The Ayurvedic Study

- The clear description of mode of action of the *Nasya Karma* is not available in *Ayurvedic* classics.
- According to *Acharya Charaka* *Nasa* is the gateway of *shira*. The drug administered through nose as *Nasya* reaches the brain and eliminates the morbid *Dosha* responsible for producing the disease.
- In *Ashtang Sangraha* also *nasa* is described as the gateway of *Shirah*. Hence the drug is administered through nostrils. The drug thus administered reaches the *Shringataka* (*Sira marma*) and spreads in *Murdha* (brain) reaching the *marmas* of *Netra, Shrotra, Kantha* and *Shiramukha*. It then by virtue of its potency scratches the morbid *Dosha* in supra-clavicular region and expels them from *Uttamanga*<sup>1</sup>.

- *Sushruta* has clarified *shringataka marma* as a *Sira Marma* formed by the union of *siras* (blood vessels) supplying to nose, ear & tongue. He further points out that injury to this *marma* will be immediately fatal<sup>2</sup>.
- Under the complications of *Nasya Karma Sushruta* noted that the excessive eliminative errhine might cause *Mastulunga* (CSF) to flow out of the nose<sup>3</sup>.
- In *Sushruta*, *A.H.*, *B.P.* etc detailed descriptions are not found about the mode of action of *Nasya Karma*.
- According to all prominent *Acharyas Nasya* is said to be the gateway of *Shira*. It does not mean that any channel connects directly to the brain but they might be connected through blood vessels or through nervous system (olfactory nerve etc.).

It is an experimentally proved fact that-

- Whenever any type of irritation takes place in any part of body, the local blood circulation is always increased. This is the result of natural protective function of the body. When provocation of *Dosha* takes place in *Shira* due to irritating effect of administered drug resulting in increase of blood circulation to the brain, extra accumulated morbid *Dosha* are expelled out from small blood vessels. Ultimately, these morbid *Dosha* are thrown out as nasal discharge, tear & salivation.

### The Modern Study

- There are no such direct pharmacodynamic considerations between nose and no such cranial organs. Moreover blood brain barrier is a strict security system that human brain has. The nose is used as a route of administration for inhalation of anesthetic materials. In the case of paranasal sinusitis certain agents are used as decongestants. Since quite a time anterior pituitary hormones as nasal spray is in practice with modern medical system.
- Vasopression or antidiuretic hormone is already in the market in the form of nasal therapy. Nasal administrations or leutinising hormone (Fink G. et al 1973) & calcitonin (Potiroli E.A.et al 1983) are found to be equally effective as intravenous infusions in maintaining blood concentrations. Hypoglyceamic effects of insulin & hyperglyceamic effects of glucagon hormone are confirmed by intranasal administration in normal & in diabetic patients (Potiroli E.A.et al 1983)
- Intranasal gonadotropin releasing hormone has been therapeutically recommended in stimulating leutinising hormone secretion in cryptorchid boys (undescended testis) (Raifer Jet al 1985). An LRH agonist nasal administration for 3-6 months was observed effective in inhibiting ovulation as a contraceptive measure (Berquist et al 1979). The drugs are mostly believed in these cases to be absorbed through nasal & pharyngeal mucosa.
- Kumar Anand (1979) has attempted contraceptive drug administration per nasal route & opined that the route is beneficial than systematic administration.

- Reduction in the gland activity & reduction in sperm prolactin was also noted. Micheal Russel (1977) has observed that perspired scent that has been painted to on the upper lips has caused the synchronization of the menstrual cycle in female volunteers by constant smelling.
- Scientists of the institute of medical sciences Delhi have proved after experiments that drug administered through *nasa* shows effective action in the brain. So it can be said that there is a very close relation between *Shira & Nasa*.

On the basis of fractional stages of *Nasya Karma* procedures, we can draw certain rational issues that are –

- Effect on Neuro-Vascular Junction
- Effect on Neuro- Endocrine level
- Effect on Neuro-Psychological levels
- Effect on drugs absorption & transportation

#### **Effect on Neuro-Vascular Junction**

- The lowering of head
- Elevation of lower extremities
- Fomentation of face

These procedures seem to have an impact on blood circulation to the head. As the efferent vasodilator nerves are spread out on the superficial surface of the face, which after stimulation at surface of the face, by fomentation may increase blood flow to the brain i.e. momentary hyperemia. It has been approximately calculated as 22% of total dilatation of cerebral capillaries the, caused by facial efferent stimulation, will lead to 15% of blood inflow (Chatterjee1980). It is also possible that the fall of arterial pressure due to vasodilation may encounter with Cushing's reaction. In which, when the ratio between the CSF pressure & cerebral arterial pressure has reduced, the increased CSF pressure tends to compress the arteries in the brain causing a transient ischemia in the brain. Due to this, the aroused ischemic response will subsequently raise the arterial pressure (Cushing). This act convinces more of 'Slush' created in intracranial space, probably forcing more transfusion of fluids into the brain tissue. Probably this may be the explanation for the benzyl penicillin like drugs which do not attain a therapeutic level in the brain in normal conditions, found to be effective during the inflammatory conditions of meninges (Gillman & Goodman 1980).

On this ground, it can be stated that the modus operandi of *Nasya Karma* has a definite impact on central neurovascular system & likely lower the blood brain barrier to enable certain drug absorption in the brain tissues.

### Effect on Neuro-Endocrine level

- The peripheral olfactory nerves are chemoreceptor in nature. These olfactory nerves differ from other cranial nerves except optic nerve, phylogenetically it is closely related to brain. Rather, it should be considered as the fib retracts of brain itself (Brobeck 1980). There are adjacent nerve called terminal nerves, which run along the olfactory nerves, and their functions are unknown (Hamilton 1966). However, it is known that these nerves are connected with limbic system of brain including hypothalamus. This limbic system and hypothalamus are having control over endocrine secretions. Moreover, hypothalamus is considered to be responsible for integrating the functions of the endocrine system and the nervous system. It is known to have direct nervous connections with the posterior lobe of pituitary. In addition hypothalamus is indirectly having connections with the anterior lobe of pituitary, through portal vessels, which supplies blood to the gland, having previously ramified in the corpora mammillaria of the hypothalamus. Electrical stimulation of this part of hypothalamus in animal is capable of inducing secretion in the anterior pituitary. It is understood that just like primitive mammals man also responds to the languages of smell in the environment (BSM 1980). Abraham and colleagues (1979) in their experimental studies have noticed that a mere exposure to the smell of the jasmine flowers reduces the activity of the mammary gland. If the fragrance could have the effect, it may be acting through impasse travelling via the olfactory pathway influencing hypothalamus, which in turn, causes the inhibition effect through the pituitary (Abraham et al. 1979).

Olfaction of certain chemical pheromones is also observed to have an impact on menstrual cycle (Russek, 1977).

- At the junction we can grasp the humor behind the recommendation of *Nasya* by Ayurvedic scholars in *Pumasavana* for changing the sex of the foetus. The drugs used for *Pumasavana* may be acting through the olfacto- hypothalamo-pituitary pathway.

### Effect on Neuro-Psychological levels

- The adjacent nerves called terminal nerves which run along the olfactory are connected with limbic system of brain including hypothalamus (Hamilton, 1966). This limbic system is also concerned with behavioral aspect of human being, besides control over endocrine secretions. Thus, certain drugs administered through nose may have an impact on immediate psychological function by acting on limbic system through olfactory nerves such a phenomenon has been revealed in the work of Cowley *et al.* (1975).
- The work has been carried out on the effect of exposing people for a short period of time, to known pheromone. The investigation showed subjects reacting differently, in assessing men & women in comparison with the control state. The people can also be influenced in their judgment by exposure to androstenol & a mixture of short chain fatty acids.
- These things certainly support the recommendation of *Nasya* made by *Ayurvedic* scholars for mental disorders like *Apasmara* and *Unmada*.

## Effect on drug absorption & transportation

- Keeping the head in lowered position & retention of medicine in nasopharynx helps in providing sufficient time for local drug absorption. Any liquid soluble substance has greater chance for passive absorption directly through the cell of lining membrane. On the other hand, massage & local fomentation also enhances the drug absorption (Fingl 1980).

The later course of drug transfusion can occur in two ways-

1. By systemic circulation
2. Direct pooling into the intracranial region.

The second way is more of interest in the study. This direct transportation can be assumed again in two paths viz.

A. By Vascular path

B. By Lymphatic path

### Vascular path

- Vascular path transportation is possible through the pooling of nasal venial blood to the facial veins, which naturally occurs. Just at the opposite entrance, the inferior ophthalmic veins also pool into the facial vein. Interestingly, both facial & ophthalmic veins have no venial 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 venous sinuses of the brain is more likely in the head lowered position due to gravity. On these lines, the absorption of drug material into meninges & related parts of intracranial organs, is a worth considering point.

Moreover, the modern scholars have noted that the infective thrombosis of the facial vein may lead to infection of the meninges easily through this path (Williams et al 1971).

Pooling of blood from paranasal sinuses also possible in the same manner.

- *Vagbhata's* notation of *Shringataka srotas* (anterior cranial fossa) seems to relate with the above explanation.

### Lymphatic path

- Drug transportation by lymphatic path can reach direct into the C.S.F. It is known that arachnoids matter sleeve is extended to the submucosal area of the nose along with olfactory nerve.

Experiments have shown that the dye injected to arachnoid matter has caused colouration of nasal mucosa within seconds and vice versa also (Hamilton 1971).

- Preliminary studies reported from A.I.M.S. Laboratories, clearly showed that steroids enters the C.S.F. rapidly following their administration as a nasal spray. Surprisingly, their levels in C.S.F. was found to be much high as compared with systemic injections (Kumar et al 1979).
- Here it may be worthy to recall *Sushruta's* caution that the excessive administration of *Virechana Nasya* (eliminative errhine) may cause oozing of *Mastulunga* (C.S.F.) into the nose. On this basis, we may say that ancient scholars of *Ayurveda* were aware of the lymphatic path in direction absorption into the brain from nose.

### Importance of Post *Nasya* Massage

- The texts have recommended light massage on the frontal, temporal, maxillary, mastoid and on *manya* region. A comfortable massage on the above regions may help to subside the irritation of somatic construction due to heat stimulation. It may also help in removing the slush created in these regions.

However, interesting here is regarding *manya* which is a *marma* existing in neck on either side of trachea<sup>4</sup> which likely to correspond the carotid sinuses of the neck. Pressure applied on the baroreceptors may bring the deranged cerebral arterial pressure to normalcy (Hejmadi S.1985). Because these receptors lying on bed of bifurcation of common carotid artery have a buffering action on the cerebral arterial pressure (Best & Taylor 1958).

### Conclusion

On the basis of the foregoing observations we can state that the procedures, postures & conducts explained for *Nasya Karma* are of vital importance in drug absorption & transportation. The facts discussed here is also convincing us about the definite effect of *Nasya Karma* in the disorders of central nervous system, mental & some endocrinal disturbances also. So, *Nasya karma* is used both to manage the *Sthanika* (local) and *Sarvadaihika* (general) anomalies and the relevancy of *Nasa hi Shiraso Dwaram* can be proved thus (Nasal route is the direct entry to the CNS).

### References

1. Astang Sangrah vol 1 sutrasthana, 29/2; pg. no. 511
2. Dr. Ambikadatta Sastri : *Susruta Sharir* 6/28; Chaukhambha publications, Varanasi; Edition-Reprint : 2006; pg. no. 56
3. Dr. Ambikadatta Sastri : *Susruta Chikitsa* 40/40; Chaukhambha publications, Varanasi; Edition-Reprint : 2006; pg. no. 184
4. Dr. Ambikadatta Sastri : *Susruta Sharir* 6/28; Chaukhambha publications, Varanasi; Edition-Reprint : 2006; pg. no. 56