

## A REVIEW OF NASYA SCIENTIFIC AND AYURVEDIC MODE OF ACTION

Kalpana Raturi<sup>1</sup>, Kanchan Chauhan<sup>2</sup>, Suvir Singh Shishodia<sup>3\*</sup>

<sup>1</sup>Lecturer, Swasthavritta, Divya Jyoti Ayurvedic Medical College, Modinagar, Uttar Pradesh.

<sup>2</sup>Reader, Shalakya tantra, Divya Jyoti Ayurvedic Medical College, Modinagar, Uttar Pradesh.

<sup>3</sup>Professor, Swasthavritta, Divya Jyoti Ayurvedic Medical College, Modinagar, Uttar Pradesh.

Article Received on 22 September 2025,  
Article Revised on 13 October 2025,  
Article Published on 16 October 2025,

<https://doi.org/10.5281/zenodo.17366277>

### \*Corresponding Author

Suvir Singh Shishodia

Professor, Swasthavritta, Divya Jyoti  
Ayurvedic Medical College,  
Modinagar, Uttar Pradesh.



**How to cite this Article:** Kalpana Raturi, Kanchan Chauhan, Suvir Singh Shishodia\* (2025). A Review of Nasya Scientific And Ayurvedic Mode of Action. World Journal of Pharmaceutical Research, 14(20), XXX-XXX.

This work is licensed under Creative Commons Attribution 4.0 International license.

### ABSTRACT

*Nasya* (~medication through nasal route) *karma* comes under the one of *Panchkarma Chikitsa*. Which processes medicine given through the nose is *Nasya*. It is a noninvasive method. *Nasya* is the fastest way to reach the medicine brain. It is the single method of *Chikitsa* in which we use any form of medicine *Sneha*, *Swaras* (liquid), *Churna* (solid), and *Dhoom* (gas). It is only an all-rounder procedure of *Panchkarma*. It is the main treatment procedure for supraclavicular disease but also for other diseases and also for healthy well-being. It is also a part of *Swasthavritta* (~ preventive and promoting health). That means daily usable *Nasya* comes under the prevention of disease. Other type of *Nasya* is for a diseased person. *Nasya* is the only type of *Chikitsa* that fulfill the main aim of *Ayurveda* which is to maintain the health state of a healthy person and cures the disease of diseased ones. *Nasya* can use as a *Shodhana* (~detoxification of body) as well as *Shamana*

*Chikitsa* (~pacification of exacerbated *Dosha*). It is equally effective in local and systemic diseases *Nasya Karma* is the prime treatment modality for *Urdhvajatrugata Vikara* (~disease of supra clavicular region). Though classics clearly mention *Yogya* (~indicated), *Ayogya* (~contraindicated) criteria for *Nasya Karma*. Intranasally administered therapeutics reach the central nervous system (CNS) via the olfactory and trigeminal neural pathways. Both the olfactory and trigeminal nerves innervate the nasal cavity, providing a direct connection with

the CNS. This review article provides a brief overview of the advantages, limitations, types, and uses of *Shalakyas* and reveal a better scientific explanation of the concept of the administration of drugs through the nasal route mechanism of nasal absorption, and applications of all form of medicine used in *Nasya Karma*.

**KEYWORDS:** *Pratishyaya, Nasya, Netra rog, Urdhvajatru rog.*

## INTRODUCTION

*Nasya* (~medication through nasal route) means instilling the medicine through the nostrils and delivering the drug to the brain, thereby acting on the whole body.<sup>6</sup> In *Ayurveda*, there are many routes of drug administration oral, rectal, vaginal, local, and nasal. *Nasya* is the fastest way to reach the medicine brain and a non-invasive method. It does not mean that any channel connects directly to the brain, but they might be connected through blood vessels or the nervous system (olfactory nerve, etc). *Nasya* strengthens the eyes, ears, nose, throat, skin, chin, teeth, neck, shoulders, arms, chest, and waist, and reduces graying & falling of hair, wrinkling, etc. Insomnia, diminished vision, migraine, tinnitus, improved speech, dental problems, alopecia, epilepsy, psychiatric disorders, common cold, hoarseness of voice, loss of sense of smell, conjunctivitis, epistaxis, unconsciousness, etc. *Prana Vayu* is taken by *Nasa* and *Shira* is the *Adhistan* of *Prana* and all sense organs are situated in *Shira*. *Nasya* is the only type of *Chikitsa* that fulfill the main aim of *Ayurveda* which is to maintain the health state of a healthy person and cures the disease of diseased ones. *Nasya* can use as a *Shodhana* (~detoxification of body) as well as *Shamana* (~pacification of exacerbated *Dosha*) *Chikitsa*. Different types of *Nasya Karma* are described in many *Ayurvedic* texts. Some types are based on the form of medicine, and some are doses of medicine. In this era, modern science also used the nasal route for medicine like a nasal decongestant. Healthy state of the nose is the most important factor for achieving the optimal goal of *Nasya*.<sup>[1]</sup> This review article provides a brief overview of the Advantages, Limitations, Types, and Uses of *Shalakyas* and reveals a better scientific explanation of the concept of the administration of drugs through the nasal route, the mechanism of nasal absorption, the mode of action of *Nasya* and applications of all form of medicine used in *Nasya Karma*.

**Synonyms-***Shirovirechana, Shirovireka, Murdhavirechana, Nasya Karma, Navana.*<sup>[4]</sup>

### Anatomy of Nose

The nasal cavity is divided into two halves by the nasal septum and extends posterior to the naso-pharynx, while the most anterior part of the nasal cavity, the nasal vestibule, opens to the face through the nostril. The nasal cavity consists of three main regions nasal vestibule, the olfactory region, and the respiratory region. The surface area of the nasal cavity is about 160 cm<sup>2</sup> (0.96 m<sup>2</sup> if the microvilli are included). The olfactory region, however, is only about 5 cm<sup>2</sup> (0.3 m<sup>2</sup> when microvilli are included). Six arterial branches serve the nasal cavity, making this region, called little's area of the nose, a very attractive route for drug administration. In particular, the blood flowing in this region is getting slightly more reabsorbed in the nasal vein, with any excess draining into the lymph vessels, making this region a very attractive route for drug delivery.<sup>[7]</sup>

### Mechanism of Nasal Absorption

The medicine administered through the nostrils reaches up to *Sṛngaṭaka Marma* (~ junction point of sense organs), spreads all over *Urdhvajatru*, and eliminates the deep-seated *Doṣas*.<sup>5</sup> The absorbed drugs from the nasal cavity must pass through the mucus layer. Intranasal administered therapeutics reach the CNS via the olfactory and trigeminal neural pathways. Both the olfactory and trigeminal nerves innervate the nasal cavity, providing a direct connection with the CNS. Direct delivery of therapeutics from the nose to the brain was initially attributed to the olfactory pathway transcellular passive diffusion: in this process, drugs diffuse through the membrane. It is an active transport process. It is more suitable for lipophilic drugs. *Sneha Nasya* absorbs through this route. Para-cellular passive diffusion: in this process, the drug is transported between the cell and transcytosis by a vesicle carrier. It is a suitable mechanism for hydrophilic drugs eg. *Avapidak*, *Dugdha*, and *Kwath Nasya*.

**Vascular path:** in the nasal cavity, the sub-mucosa is highly vascularized. The large surface of the nasal cavity and relatively high blood flow promotes rapid absorption. The drug absorption is rapid because of the high permeability of nasal epithelium as it is more permeable than the GI tract. Hepatic first-pass metabolism is also avoided via this route. Position of the patient, as well as *Purvakarma* (~preparatory procedures) *Abhyanga* (~therapeutic massage), and *Mrudu Sweda*, facilitates the drug absorption due to vasodilatation and increased blood circulation. The rich supply of blood and a large surface area makes the nasal mucosa an optimal location for drug administration. Transportation is possible through the pooling of nasal venous blood into the facial vein. The facial vein has no

valves. It communicates freely with the intracranial circulation, not only at its commencement but also by the supra orbital veins which are connected with the ophthalmic vein, a tributary of the deep facial vein, which communicates through the pterygoid plexus with the cavernous venous sinus. More recently, the contribution made by the trigeminal pathway to IN delivery to the CNS has also been recognized, especially to the caudal brain regions and the spinal cord.<sup>[9]</sup> Drug transport across the nasal epithelium by these mechanisms-transcellular passive diffusions, and Para-cellular passive diffusion, carries mediated absorption and secretion. Absorption through transcytosis and Efflux transitionally are two theories that are considered predominantly.

### LIMITATIONS

The histological toxicity of absorption enhancers used in nasal drug delivery systems is not yet clearly established. The nasal cavity provides a smaller absorption surface area when compared to GIT. There is a risk of local side effects and irreversible damage of the cilia on the nasal mucosa, both from the substance and from constituents added to the dosage form. Certain surfactants used as chemical enhancers may disrupt and even dissolve membranes in high concentrations. There could be a mechanical loss of the dosage form into the other parts of the respiratory tract like the lungs because of the improper technique of administration.

### *Nasya in Shalakyas*

*Nasya Karma* is also a prime treatment procedure for various Diseases which are related to *Shalakyas* (~Ear, Nose, Throat & Head, and Ophthalmology). All three *Acharya* (~Pioneer) Of *Ayurved* namely *Charaka*, *Sushruta*, and *Vaghabhata* have explained the importance of *Nasya Karma* in Concerned diseases of *Shalakyas* (~Ear, Nose, Throat & Head and Ophthalmology). *Nasya Karma in Shalakyas* Can be described as *Nasya Karma in Karna Roga* (~Diseases of Ear), *Nasya Karma in Nasa Roga* (~Diseases of Nose), *Nasya Karma in Mukh Roga* (~Diseases of Oral Cavity), *Nasya Karma in Shiro Roga* (~Diseases of Head), *Nasya Karma in Netra Roga* (~Diseases of Eye).

### *Nasya Karma in Karna (~Diseases of Ear)*

*Vaghabhatacharya* has described the indication of *Nasya Karma* in the “*Uttar Sthan Chapter 18 Karnagatrog Pratishedh*” and out of 25 Diseases indicated for *Pittaj-Karnashool*, *Kaphaj-Karnashool*, *Pakva- Karna*, *Karna-Naad* & *Karna-Badhirya*. *Vaghabhatacharya* has also described the indication of *Nasya Karma* in “*Uttar Sthan Chapter 18 Karnaroga Pratishedh*” for *Karna-Paligat Roga* namely *Karna-Mala*, *Paali-shosh* & *Unmanth*. *Sushrutacharya* has

described the indication of *Nasya Karma* in the “Uttar Sthan Chapter 21 *Karnaroga Pratishedh*” and out of 28 Diseases indicated for *Karna-Pratinaah*.

### **The Ear disease indicated for *Nasya Karma* are**

*Pittaj-Karnashool* (~EarAche). *Kaphaj-Karnashool* (~EarAche) *Pakva-Karna* (~Otitis media). *Karna- Naad* (~Tinnitus). *Karna-Badhirya* (~Hearing Loss), *Karna-Pratinaah* (~Eustachian dysfunction).

### ***Nasya Karma* in *Nasa Roga* (~Diseases of Nose)-**

*Sushrutacharya* has described the indication of *Nasya Karma* in the “Uttar Sthan Chapter 23 *Nasarog Pratishedh*” and “Uttar Sthan Chapter 24 *Pratishyaya Pratishedh*” out of 31 Diseases indicated for *Puya Rakta*, *Kshavatu*, *Branshtu*, *Nasa-Straav*, *Nasa- Shosh*, *Nav-Pratishyaya* & *Vataj-Pratishyaya*. *Charkacharya* has described the indication of *Nasya Karma* in the “*Chikitsa Sthan* Chapter 26 *Trimarmiya*” and out of 10 Diseases indicated for “*Vataj-Pratishyaya*, *Apinasa*, *Pittaj-Pratishyaya*, *Puya Rakta* & *Kaphaj-Pratishyaya*” *Vagbhatacharya* has described the indication of *Nasya Karma* in the “Uttar Sthan Chapter 20 *Nasa Roga Pratishedh*” and out of 18 Diseases indicated for “*Vataj-Pratishyaya*, *Pittaj-Pratishyaya*, *Kaphaj-Pratishyaya*, *Sannipataj-Pratishyaya*, *Kshavatu*, *Putaka*, *Nasa-Shosh* & *Nasa-Naah*. The Nose diseases indicated for *Nasya Karma* are *Apinas* (~Atropic Rhinitis), *Puya Rakta* (~Purulent Sinusitis), *Pratishyaya* (~Rhinitis), *Vataj-Pratishyaya* (~Ac. Viral Rhinitis), *Pittaj-Pratishyaya* (~Bacterial Rhinitis), *Kaphaj-Pratishyaya* (~Allergic Rhinitis), *Sannipataj-Pratishyaya* (~Chronic Rhinitis), *Kshavatu* (~Sneezing), *Branshtu* (~Chronic Rhinitis), *Nasa- Straav* (~Discharge from Nose), *Nasa-Shosh* (~Dryness of Nose), *Nav-Pratishyaya*, *Putaka* (~Crepitus).

### ***Nasya Karma* in *Mukh Roga* (Diseases of Oral Cavity)**

*Sushrutacharya* has described the indication of *Nasya Karma* in the “*Chikitsa Sthan* Chapter 22 *Mukh Roga Chikitsa*” and out of 65 Diseases indicated for “*Shitad*, *Danta Puputak*, *Dantaveshtak*, *Saushir*, *Upakush*, *Danta Harsh*, *Krimi Danta*, *Chala Danta*, *Rohini* & *Sarvasar*”. *Vagbhatacharya* has described the indication of *Nasya Karma* in the “Uttar Sthan Chapter 22. *Mukh Roga Pratishedh*” and out of 75 Diseases indicated for “*Khandoshta*, *Vataj-Oshtaroga*, *Kapahaj- Oshtaroga*, *Shita Danta*, *Krimi Danta*, *Danta Shool*, *Shitad*, *Upakusha*, *Dantasaushir*, *Vaidharbha*, *Dantanaadi*, *Pittaj-Jivhakantak*, *Talu Shosh*, *Vataj-Rohini*, *Kaphaj-Rohini*, *Vataj-Mukhapaka*, *Arbuda* & *Putimukh*. *Charkacharya* has not indicated *Nasya Karma* in *Mukh roga*. The Oral Cavity diseases indicated for *Nasya Karma*

is-Shitad (~Gingivitis), *Danta Puputak* (~Periodontal Abscess), and *Dantaveshtak*. (~Chronic Periodontitis), *Saushir* (~Periodontitis), *Upakush* (~Inflammatory Periodontitis), *Danta Harsh* (~Hyperesthesia of the tooth), *Krimi Danta* (~Dental Caries), *Chala Danta* (~Tooth Mobility), *Shita Danta* (~Cracked Tooth), *Danta Shool* (~Toothache), *Dantasaushir* (~Periodontitis), *Vaidharbha* (~Traumatic Periodontitis), *Danta Naadi* (~Alveolar Fistula), *Rohini* (~Diphtheria), *Vataj-Rohini* (~Faucial diphtheria), *Kaphaj-Rohini*, *Sarvasar* (~Stomatitis), *Vataj-Mukhapaka* (~Oral Herpes), *Khandoshta* (~Cleft Lip), *Vataj-Oshtaroga*, *Kapahaj-Oshtaroga*, *Pittaj-Jivhakantak* (~benign migratory glossitis), *Talu Shosh* (~Xerostomia), *Arbuda* (~Carcinoma of the palate), *Putimukh*. (~Halitosis).

### **Nasya Karma in Shiro Roga (Diseases of Head)**

*Sushrutacharya* has described the indication of *Nasya Karma* in the “*Uttar Sthan Chapter 26, Shiro Roga Pratishedh*” and out of 11 Diseases indicated for “*Samanya-Shiroroga, Pittaj-Shororoga, Kaphaj-Shororoga, Kshayaj-Shiroroga, Krimij-Shiroroga, Ardhabhedhak & Shankhak*”. *Charkacharya* has described the indication of *Nasya Karma* in the “*Chikitsa Sthan Chapter 26 Trimarmiya*” and out of 05 Diseases indicated for “*Khalitya, Palitya, Sarva-Murdha Roga*”. *Vagbhatacharya* has described the indication of *Nasya Karma* in the “*Uttar Sthan Chapter 24, Shiro Roga Pratishedh*” and out of Diseases *Shirogat* and *Kapalgat Roga* indicated for “*Vataj-Shirobhitap, Pittaj-Shirobhitap, Kaphaj-Shirobhitap, Sannipataj-Shirobhitap, Krimijanya-Shirobhitap, Krimij-Shiroroga, Darunak, Khalitya, Palitya, Rakta-Pittaj Shiroroga, Ardhabhedhak, Sarva Jatruvdha Roga*”.

### **The Diseases of the Head indicated for Nasya Karma are**

*Samanya-Shiroroga* (Headache), *Pittaj-Shororoga* (~Headache due to sinusitis), and *Kaphaj-Shiroroga*. (~Headache), *Rakta-Pittaj Shiroroga* (~Headache), *Sannipataj-Shirobhitap*, *Kshayaj-Shiroroga* (~Post traumatic Headache), *Krimij-Shiroroga* (~Maggot/Myiasis), *Ardhabhedhak* (~Migraine), *Shankhak* (~Temporal arteritis), *Khalitya* (~ Nonscarring inflammatory alopecia), *Palitya* (~Graying of hair), *Sarva-MurdhaRoga* (~Head diseases), *Darunak* (~Tinea capitis), *Sarva Jatruvdha Roga* (~Diseases above the Clavicle area).

### **Nasya Karma in Netra Roga (Diseases of Eye)**

*Sushrutacharya* has described the indication of *Nasya Karma* in the “*Uttar Sthan Chapter 17- Drishtigat Roga & Chapter 18- Kriyakalpa* ” and out of 76 Diseases indicated for “*Vataj Timir, Pittaj-Timir, Pitta Vidagdha Drishti*,” *Vagbhatacharya* has described the indication of



*Nasya Karma* in the “Uttar Sthan Chapter Vartma Roga Pratishedh, Chapter-11 Sandhisitasit Roga Pratishedh, Chapter-13 Timir Pratishedh, Chapter-14 Linganaash Pratishedh & Chapter- 16 Sarva Akshi Roga Pratishedh” and out of 94 Diseases indicated for “Pakshma Shaat, Kaphotklisha, Pakshmarodh, Nimna & Shudh Shukra, Timir, Kaphaj Timir, Shushka Akshipaak, Pilla Roga & Netra Rakshak.

### **The Diseases of the Eye indicated for *Nasya Karma* are**

*Timir* (Immature superficial cortical cataract), *Vataj Timir*, *Pittaj-Timir*, *Kaphaj Timir*, *Pitta Vidagdha Drishti* (Hemeralopia), *Pakshma Shaat* (Madarosis), *Kaphotklisha* (Blenorrhea), *Pakshmarodh* (Trichiasis), *Nimna & Shudh Shukra* (Corneal ulcer), *Shushka Akshipaak* (Stiffness of the lid with xerophthalmia), *Pilla Roga*, *Netra Rakshak* (Eye Protective).

### **DISCUSSION**

In *Ayurveda*, the nose is a gateway to the brain. *Nasya Karma* is the process that eliminates the vitiated *Doshas* of the *Urdhvanga* ensuring the smooth functioning of the brain and ultimately whole body. *Nasya* is done to assess the *dosha*, *ritu*, *rog-rogibala*, *kalayogya* and *ayogya*. It is a simple and easy handling. It is not causing any complications. It is given in any *doshajvyadivataj*, *pitaj*, *kaphaj*, *raktaj* and *sannipataj* any suitable form of medicine *swaras*, *churna*, *Sneha*, and *dhoom*. It can be used for preventive as well as treatment purposes. There are many drugs are available for *Nasya* like *Anutail*, *shadbindutail*, *balatail*, *cowghee*, milk etc. It is the best procedure done in this era. During the pandemic COVID 19 everyone used *Nasya* of *Anu Tail* for prevention. It works 100% and does not cause even one single complication. People who took the vaccine face many complications and some of them got a COVID positive. But only *Nasya* gives its efficacy and effectiveness to both those who take it for prevention and who are ill. *Nasya* has proven to be effective in treating COVID 19. So, it is the best procedure for this era where everyone is in hurry. *Nasya* is the treatment of choice for all *urdwajatrugataroga* as well as all neurodegenerative diseases. During this period many more diseases have no treatment or cure available. Regular use of *pratimarsha Nasya* can be effective to prevent these types of diseases. Regular use of *Nasya* can slow down the prevalence of blindness, hearing impairment, and mental disorder and is the emergency solving treatment for all *Ayurved* practices.

**Source of Support:** Nil.

**Conflict of Interest:** None Declared.

**Types of Nasya-Tables 1: Classification according to various Acharyas**

SN	Classification	Acharya
1.	<i>Rechana</i> (~cleansing type of <i>nasya</i> therapy), <i>Tarpana</i> , <i>Shamana</i> (~ <i>nasyam</i> therapy having pacifying effect)	<i>Charaka</i>
2.	<i>Navana</i> (~medication of unctuous substance through the nose) <i>Avapidana</i> (~ <i>nasya</i> therapy by expressed juice from paste), <i>Dhmapana</i> (~ <i>nasya</i> therapy by medicated powder insufflations), <i>Dhuma</i> (~ <i>nasyam</i> therapy using medicated smoke), <i>Pratimarsha</i> (~removal of <i>śalya</i> by low dose <i>nasya</i> therapy)	
3.	<i>Phala</i> , <i>Patra</i> , <i>Mula</i> , <i>Kanda</i> , <i>Pushpa</i> , <i>Niryasa</i> , <i>Twaka</i>	
4.	<i>Shirovirechana</i> (~medication through the nose for cleansing or errhine), <i>Pradhama</i> , <i>Avapida</i> , <i>Nasya</i> , <i>Pratimarsha</i>	<i>Sushruta</i>
5.	<i>Virechana</i> , <i>Brimhana</i> (~nourishing <i>nasya</i> therapy), <i>Shamana</i>	<i>Vagbhata</i>
6.	<i>Brimhana</i> (~nourishing <i>nasya</i> therapy), <i>Karshana</i>	<i>Kashyapa</i>
7.	<i>Rechana</i> , <i>Snehana</i>	<i>Sharngdhara</i>
8.	<i>Prayogika</i> , <i>Snehika</i>	<i>Bhoja</i> and <i>Dalhana</i>

## CONCLUSION

*Shodhana Karma* is always very effective before any therapy. *Nasya* is one among them is the best for *Urdhwajatru Vikaras* which includes *Netra Vikaras*. Compared with other *Shodhana Karmas*, *Nasya* is a less expensive and less complicated therapy. Since *Nasya* can give a *Sthanika Shodhana* of *Shirah* and *Netra* is situated in *Shirah*, it can act faster in *Netra* and can be more effective. Proper administration of *Nasya* in the early stages of *Netra Rogas* can even avoid unwanted surgeries. Thus, it promises a faster and more effective therapy for the prevention and cure of *Netra Rogas* which has been already proven through various researches. *Panchakarma* is the most essential treatment of diseases of the Ear, Nose, Throat & Head, and Eye (*Shalakya Tantra*) as *Nasya Karma* is indicted for *Urdhwajatrugata Roga* (Ear, Nose, Throat & Head and Eye Diseases). As per the Basic principle of *Ayurvedic Treatment* Before giving treatment for any Disease; the purification of the body is necessary.

*Nasya* can be either hydrophilic or lipophilic in nature. It means *swaras* (Juice), *dugdha* (Milk), or *Kashaya* (decoction) as hydrophilic and *Taila* (Oil) and *Ghruta* (Butter) as lipophilic are used. The nasal Cavity is covered by a well-vascularised thin mucosa; therefore, a drug molecule can be transferred quickly across the single epithelial cell layer directly. Within 5 minutes for smaller drug molecules. According to *Sushruta*, *Nasa* is the route for the brain. The nerve cells of the “*Shiraso Dwaram*” i.e. Nasal cavity are the entry of olfactory epithelium project into the olfactory bulb of the brain, which provides a direct connection between the brain & external environment.



## REFERENCES

1. Prasad BS, Patil D, Pardeep LG, Hiremath V, Sreelakshmi CR. Development of a Nasya fitness form for clinical practice. *Anc Sci Life*, 2014 Oct- Dec; 34(2): 100-2. doi: 10.4103/0257-7941.153470. PMID: 25861145; PMCID: PMC4389386.
2. Aulton M.E. "Pharmaceutics – The science of dosage form design" Churchill Livingston., 494: 2002.
3. Hirai, S., Yashiki, T., Mima, H., Effect of surfactants on nasal absorption of insulin in rats, *Int. J. Pharm*, 1981; 9: 165-171.
4. Agnivesha, Charaka Samhita of Acharya Charaka, Dridhabala krit, edited by Vaidhya Jadhavji Trikamji Acharya. Chikitsa Sthana. Ch.25, Ver. 20. 5th edition, Varanasi: Chaukhamba Sanskrit Sansthan, 1990; p. 225
5. Paradkar HS, editor. Ashtang Hridaya of Vagbhata, Sutra Sthana; Nasyavidhi Adhyaya. Reprint Edition. Ch. 20, Ver. 1. Varanasi: Chowkhamba Krishnadas Academy, 2006; p. 287.
6. Gizurarson S. Anatomical and histological factors affecting intranasal drug and vaccine delivery. *Curr Drug Deliv*, 2012; 9: 566–82.
7. Hanson LR, Frey WH 2nd. Intranasal delivery bypasses the blood-brain barrier to target therapeutic agents to the central nervous system and treat neurodegenerative disease. *BMC Neurosci*, 2008 Dec 10; 9 Suppl 3(Suppl 3): S5. doi: 10.1186/1471-2202-9-S3-S5. PMID:19091002; PMCID: PMC2604883.
8. Ross TM, Martinez PM, Renner JC, Thorne RG, Hanson LR, Frey WH., 2nd Intranasal administration of interferon beta bypasses the blood-brain barrier to target the central nervous system and cervical lymph nodes: a non-invasive treatment strategy for multiple sclerosis. *J Neuroimmunol*, 2004; 151: 66 – 77. doi: 10.1016/j.jneuroim.2004.02.011.
9. Muthumanickam, Alagusundaram & B. Chengaiah, & K. Gnanaprakash, & Ramkanth, Dr S & Madhusudhana, Cmm & D. Dhachinamoorthi, (2010). Nasal drug delivery system - an overview. *International Journal of Research in Pharmaceutical Sciences*. Shastri KA, editor.
10. Sushruta Samhita, Chikitsasthan, Ch 40, ver.40 (Reprint). Chaukhamba Sanskrit Sansthan, Varanasi, 2008; 184.