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**“NOSE- A REVIEW STUDY ON THE ANATOMY CONCERNING THE ANATOMY OF NOSE IN AYURVED.”**

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**ABSTRACT:**

The nose is a part of the five senses present in the body, which are, the eyes, nose, tongue, ear, and skin. All these five sense organs are an important part of the body's anatomy and physiology as it helps in receiving the sensation of smell and helps the person in understanding the nature of smell and its meaning. These five senses are named “pancha-gyanendriya” in Ayurveda and state the same thing just in a bit different way, when stating the panchgyanendriya they state them as shabda, sparsha, roopa, rasa, gandha, now, in Ayurveda, it is stated as gyanendriya ad this panchaendriya is residing under/in the panchaendriya-adhishthana which are, Karna (ears), twak(skin), akshi(eyes), jivha(tongue), nasa(nose) respectively. There are some very interesting points mentioned in the text where Acharyas mention the anatomy and physiology of nasa in Ayurved, and all of these points are going to be discussed below. Nasa or nose is a very important part of pancha gyan endriya without which adequate knowledge is not possible to be gained by the person.

**KEYWORDS:** Nasa, shabda, sparsha, roopa, pancha-gyanendriya, Gandha

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**INTRODUCTION:**

Nasa is one of the important parts in the anatomy of the body as it with-holds the gyanendriya gandha and helps in receiving knowledge from the outside world and processing it. Even after being an important part of human anatomy, Ayurved does not have much information on the anatomy of the nose, some of the information might have been lost due to the effect of time, since, it makes sense for acharyas to explain the anatomy in detail as they use this pathway for panchakarma

treatment as well. The role of nasa is not just limited to being adhishthana to gandha but also has many other important functions as well, like, the nasya procedure, the dhoomapana procedure, etc. All of these procedures are possible through the same pathway only.

***Ghran-indriya Panch Panchak***

Nasa being the adhishthana of gandha is a part of gyanendriya and the indriya pancha-Panchak for this organ goes as follows-

<b><i>GHRAN-INDRIYA PANCH</i></b>	<b><i>PANCHAK</i></b>
Indriya	Ghran-indriya
Indriya adhishthana	Nasika
Indriya dravya	Prithvi
Indriya vishaya	Gandha
Indriya Buddhi	Ghrana-Gyan

The indriya pancha-Panchak is a set of 5 components that are kept together to help understand the nature and functioning of the senses better. The indriya that we are talking about is the ghran-indriya, and this indriya is adhishthit in our nasika/nasa the important factor comes next, the indriya dravya, with which it is composed of is said to be the Prithvi mahabhoota, how does this relate? Let's check, nasa, which is a part of urdhwag jatra gata sharir, is a sthan of kapha as kapha resides primarily in the upper part of the body. We know, the kapha dosha itself comprises prithvi and jala mahabhoota, so why does the nose not comprise both the mahabhootas as well? The reason behind it remains as follows- the vishaya of this indriya is gandha. Jala mahabhoota does not have any kind of gandha to it, gandha is exclusively a part of prithvi mahabhoota, and following this then this nasa has gandha as its primary vishaya this becomes the reason why nasa is said to be composed of prithvi mahabhoota. After getting this point, moving

forward, we observe the indriya buddhi, which for ghrana-indriya is gandha/ghrana-gyan, i.e., the knowledge of smell. So how does this indriya gain knowledge from the outside world? It is explained in the texts as follows- the sannikarsha between the mana and indriya becomes the prime basis of gain of knowledge by the person. What does sannikarsha mean? sannikarsha is a phenomenon of connection of two principles/parts that then leads to a specific result, so here the sannikarsha between the two i.e. the mana and the indriya leads to the gain of knowledge. this knowledge is then shared and its effect is seen throughout the body, now, here we have seen the Pancha-Panchak and this Panchak is extremely important to understand the functioning of the senses, we can see this as follows, we have seen the indriya dravya, that stated the prithvi mahabhoota and we understood the reason behind this mention, now, similarly, we have one Panchak as the indriya buddhi, now, in Ayurveda buddhi is considered as a different entity that works in

collaboration with the manas and helps in receiving the knowledge from our surroundings, in the similar way the indriya buddhi represents the buddhi or some kind of intellect that works and helps in receiving the knowledge by us which is referred to as the vishaya of the indriya or the indriya gyaan, which for the ghrana indriya is gandha. Now, if we see the indriya buddhi for the ghrana indriya it is said to be ghrana gyan which helps us to identify or perceive different types of smells, understand them, and process these smells, now, if we see this from the modern point of view, we see that these functions are similar to the function of the piriform cortex, amygdala and the orbitofrontal regions of the brain. The functions of these regions of the brain are as follows-

*Piriform cortex*- it serves an important role in odor discrimination and perception, helps in synthetic processing of the complex odorant mixtures, and helps in olfactory sensory gating and recognizing odors from the experience i.e., odor memory and also, odor habituation.

*Amygdala*- amygdala could be involved in the higher-order processing of olfactory memory, which works like the perceptual representation of the odorant that is there for memory encoding. This processing is dependent on the signals that are received from the piriform cortex and the peri-amygdaloid cortex.

*Orbito-frontal regions of the brain*- The olfactory cortex is present in the orbitofrontal region of the brain that helps in understanding the sense of smell, it is a part of the cerebrum. It includes the piriform lobe and the hippocampal formation.

So, in this way, just the factor of indriya buddhi, one-word buddhi contains so many factors and each factor perform one of the very important functions that are essential for the perception and the knowledge of the smell and odors.

### ***Anatomy of Nose***

In Ayurved, the Anatomy of the nose is not explained in very extensive detail but the points that are mentioned are as follows-

In the Sushruta Samhita sutrasthana and sharir sthana, the mentions of the anatomy of the nose are present

Sushruta Acharya mentions that the praman of the nasaputa are given with two different measures, i.e., it is of 2 angula pramana, and its vistara is said to be of 1/3rd angula, which could be understood as the circumference of the nasaputa be 2 angula and the diameter of the nasaputa be 1/3rd angula and the length of the nasika is said to be 4 angula. Now, acharyas Sushruta in Sushruta sharirsthana chapter 5 states that, "*nasayam trini*" which means that the asthi in the nasika are three in number. These bones present in the nose are said to be tarunasthi i.e., they are mostly cartilaginous. when we see the modern anatomy of the nose, we can find this specific point where they state that almost 2/3rd parts of the nose is cartilaginous and only 1/3rd parts are bony. While the sandhi or joints are said to be one only which is mentioned as follows "*eka kaklake nasayasch*" As for the dhamani, acharya states that there are two dhamani that help in the transmission of the smell or gandha and 24 siras are present out of which four sira must be protected at all the costs. There are two peshi or muscles present in the nose. All of these anatomical points are mentioned in the Sushruta sharirsthana. If we are to explain the ghran-indriya in modern terms, the closest relation that could be found in the internal lining of the nose, which is of two types, so two types of lining in the nose is the olfactory region of the nose and the respiratory region of the nose, but before that there is one lining that has skin and hair that has hair follicles and sebaceous gland. Now, how are these two parts divided in the nose are as follows-

**Olfactory Region-** the olfactory region is consisting of the upper 1/3rd part of the nasal cavity up to the level of superior concha along with the corresponding part of the nasal septum and roof of the nasal cavity, the membrane here is paler in color, and this is the part which is predominantly responsible for the sensation of smell so this layer or this region with the supply of the olfactory nerves that ends in the olfactory bulb could be the closest relation that one could get to the ghrana-indriya that is adhishtit in the nasika.

**Respiratory Region-** The remaining lower 2/3rd part of the nasal cavity form the respiratory region of the nose which is lined by thick mucous membrane. This part is highly vascular and even contains erectile tissue. surface lined by the pseudostratified ciliated columnar epithelium with plenty of goblet cells, and in the sub-mucous membrane of the mucous membrane, it contains many serous and mucous secreting glands ducts which open to the surface of the mucosa. Now, there are two very important marma present in the nose, which are, the shringataka marma and the phana marma. These two marma goes as follows-

**Shringataka Marma-** four in number, sadhya pranahara marma, which means if there is any kind of injury to this specific marma there are high chances of death on-site. A sira marma, which tells us that at this point many siras make connections i.e., there is sannipataj of siras and those siras are as follows- the siras that provide nourishment to the nose, ears, eyes, and tongue are connected at this point or placed very close to each other. These marmas are present two on the inner part of the eyes, one on the depression above the lips, and one on the depression below the lips. Thus, a total of four.

**Phana Marma-** these are two in number present in the depression of the folds of the nose. If there is any kind of injury in these marmas then the person may lose their sense of smell. It comes under the category of shiro-griva gata marma which means the marma present in the area of head and neck. This also is a sira marma similar to the shringataka marma. This is a part of the vaikalyakara marma i.e., if injured will form a deformity in the nose, which as seen above injury to this marma may lead to loss of sense of smell.

#### **Clinical Anatomy of the Nose**

- **Common cold/Rhinitis-** it is one of the most important and common infections of the nose, this may be infective or allergic, a common cause is due to changes in seasons. Rhinitis known as “pratishyay” in Ayurved is also a very common disorder that happens in the nose and is easily and treatable through nasya and many other medicines and procedures.
- **Sinusitis-** A common condition where the nasal passages are inflamed that can be caused due to a variety of reasons one of the most common causes being the cold or “pratishaya” Now, this is normally easily treatable by clearing the passage but if the condition continues it may lead to accumulation of the sinus for a long time and may lead to growth of condition and lead to the condition of chronic sinusitis that will lead to conditions like pain in the facial regions, headache, nasal congestion, nasal inflammation etc.
- **CSF Rhinorrhea-** A trauma to the facial region may lead to the fracture of the cribriform plate which then leads to the tearing off of the meninges and may also tear the olfactory nerve rootlets, in such cases then the CSF drips down to the nasal cavity a condition called as CSF Rhinorrhea.
- **Epistaxis-** Bleeding from the Nose is called Epistaxis. There is an area in the nose called “Little’s Area”, which is the

most common site for the epistaxis, and the artery involved is the Sphenopalatine artery.

- **Deviation of the Nasal Septum-** Nasal septum is an anatomical structure that divides the nose into two halves. This Nasal septum in an ideal setting divides the nasal cavity into two halves, but clinically that is not exactly the case, and more than 70 % of people in the world suffer from a condition called the Deviated Septum, in which the nasal septum does not divide the nasal cavity into two halves but in two unequal halves as the septum is not present in its proper position but is deviated to one side, which leads to narrowing of one of the sides of the nasal passage which then becomes the common cause of recurrent attacks of cold, rhinitis, sinusitis, etc. and this condition can be corrected through surgery mostly.

Above mentioned are some of the most common anatomical conditions that are seen in a clinical setting.

#### ***Importance of Nose as Passage for Treatment in Ayurved.***

The nose as mentioned earlier is very commonly used as a passage for the treatment procedures like panchakarma etc. even in yogic settings nose plays an important role in maintaining order in the body and maintaining the health of the person in general. All of these procedures are explained in detail below-

**1. Nasya-** Nasya is one of the major procedures used in the treatment of a variety of diseases of the urdhwag-jatrugata path like shirashoola, pratishyaya, etc. when the aushadh dravya are administered into the body using the nasal route then the procedure is called the nasya. Nasya is said to be 5 main types according to acharya charak, which are- navan nasya, avpidak nasya, dhmapan nasya, dhooma nasya and pratimarsha nasya. Another classification states the nasya

to be of 3 types which are rechak nasya, tarpak nasya and the shaman nasya. This way according to different mata and mata-antaras there are many types of nasya. The mode of action of nasya goes as follows- nasika is considered as the pathway of the shira Pradesh and administering the drug through this pathway eliminated the vitiated doshas that are responsible for the production of the disease and thus helps in balancing the doshas and eliminating the disease. Now, acharya Sushruta also mentions "mastulungagam" as a symptom of atiyoga of the nasya and this states the condition similar to the CSF Rhinorrhea and this explains that Acharya Sushruta was well aware of the connection of brain and nose acharya vagbhata also mentions how the drugs administered through the nasal passage passes through the shringataka marma and shringataka marma is known to be the path that connects the siras that nourish the netra, Karna, jivha, and nasya so this way when drug passes through this marma it will be able to alleviate the doshas accumulated at this point that may be related to any of the organs mentioned above, this might be on the reason why nasya is so extensively used in the urdhwag-jatrugata disorders. If we see the same pathway from the point of view of modern sciences it states that the nasal passage is a highly vascular pathway that helps in faster absorption of the important components through the vascular lining and also helps in bypassing the metabolism as it is a par-enteral route of drug administration also this passage is directly or closely connected to the brain thus may be the best administration route for the drugs that are to be administered in the brain bypassing the blood-brain barrier. This way the nose is an important anatomical passage of drug administration in the point of Ayurveda



that has been used for many many years.

**2. Neti-** Neti is an important part of a yogic cleansing procedure called the shatkriya or shatakarma, this karma comes under the branch of hatha yoga, in this procedure, the anatomical part of the body through which the procedure is completed is the nasika. So, this procedure of neti is carried out in the following manner- the substance or mostly jala or water is taken into a neti pot and this neti pot is then placed at the entrance of the right nasal cavity or nasa puta, and then the head is tilted a bit to the left then the water is slowly poured into the nostril and controlling the breath this water is allowed to pass through the other nostril this procedure is repeated for both the nostrils. This procedure of neti is basically of two types which are, Jala-Neti and Sutra-Neti. These two types of neti are very different from each other and their effects are found to be equally different. These two types of neti are as follows-

- **Jala Neti-** As the name suggests, jala or water is used in this procedure and the water is allowed to pour into one nostril and to be excreted from the other nostril this way the water flows through the whole nasal cavity, and the whole pathway is cleansed so that there are no impurities left and this way this procedure helps in strengthening one's sense of smell along with the ability to control the breath that comes with practicing this procedure continuously and with strengthening the sense of smell it also strengthens the muscles of the nose. It also strengthens the eyesight, balances the doshas, and also does the shodhan of Kapal Pradesh.
- **Sutra Neti-** in the procedure of sutra neti, a 1.5-foot long thread and this is divided into 1/3rd part, then this part is then dipped into safe wax and it is covered with it, after that when to be used this sutra should be dipped in warm water, made soft and after that,

this sutra should be inserted through the right nasal passage and then the sutra should be carefully brought out of the moth with the help of index finger and the thumb after getting the threaded piece this thread should be repeatedly moved 10-15 times in the nose and after that this thread is to be removed from the buccal cavity and to be washed thoroughly then this same procedure is to be repeated from the other nostril as well, in this way the sutra neti helps in shuddhi of the nasal passage and also helps in aligning and cleaning the passage thoroughly, helps in strengthening the sense of smell, helps in balancing the doshas, pacify the urdhwag-jatrugata vyadhi, strengthens vision and also helps in kapala shodhan. This way the procedure of neti helps in balancing the doshas and helps in cleansing or shodhan of the upper part of the body.

**3. Pranayam-** Pranayam is also a part of yogic procedures in which the breathing exercises are included, now, breathing is a normal procedure that everyone does, the question arises what is so different and special about the pranayama that helps in the management of disorder or can be used in the treatment procedure, now, we do know the conditions like the asthma or shwas in general, in such conditions the patient's breathing conditions are not good and adequate and in such conditions pranayama are extremely helpful, like for one example in stress disorder or the anxiety disorder the patient is advised to practice the deep breathing exercise or other such exercises, now all these exercises comes under the pranayama only and it works on the following principle, when the air is breathe in deeply, the nasaputa are the opening of the respiratory pathway then in this pathway, the person who practices the deep breathing exercises the air inhaled reaches the lungs and this air that is reached to the lungs, this then increases the supply of oxygen

throughout the body and brain as well, that helps in relaxing the brain and thus helping in the conditions like the anxiety disorders etc. this comes under the adravya chikitsa. This way the importance of an anatomical structure i.e., nose in the treatment procedures and its pathways are explained in detail here.

#### **DISCUSSION:**

The nose or nasika is a small but important part of the anatomy of the human body, which helps in breathing and sensing smell, it becomes the opening of the respiratory tract and respiration is one of the most important life processes which helps the body in gaining the adequate amount of air and oxygen that is needed to keep the body working on the cellular level thus proper care of this part is extremely important for which Ayurveda states the procedures like the nasya, neti, etc that definitely becomes a part of treatment but it is also an important part of preventing therapy when taken into consideration the daily health of the body parts. There is another aspect of nasal anatomy that is an interesting part according to the ayurvedic sciences which is the indriya pancha-Panchak, in this article the topic has been discussed in detail but still this part of the anatomy is not yet totally explored and needs to be looked into with much more detail. For example, in Pancha Panchak the sense of smell i.e. the indriya vishaya and the indriya adhishthana which is nasika are explained to be different from each other, to date, we have not been able to understand or explore this part of anatomy how are the two different? These parts need to be looked into with much more detail.

#### **CONCLUSION:**

The nose, an anatomical structure in the supra-clavicular part of the body, is responsible for the inhalation and exhaling of air, responsible for the reception of the smell present in our

surroundings, this organ is mentioned in Ayurveda in a very similar yet different manner, the anatomical structure under discussion is one of the five sense organs responsible for receiving the signals from the environment which in Ayurveda is said to be the parts responsible for perceiving the knowledge present in our surroundings. Anatomy mentioned in both modern sciences and the Ayurvedic sciences is very similar to each other in some manners, Ayurveda mentions the presence of marma points that are to be kept in mind that is about the nose, the two marma points are the shringataka marma and the phana marma. One of them is the sadhya-pranahara marma is an extremely vital point that must be treated or stimulated with extreme care. Not just in Ayurved but also in modern sciences nose plays an important role as one of the paths of drug administration or for other treatment-related purposes, diagnostic purposes, etc. An anatomical structure is not just a structure but comes with many things along with it that include its normal physiology, abnormalities, pathologies, and treatments. So, considering all of these points this one structure is explained here.

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