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Applied Anatomical Consideration of Eye, Ear and Nose as per Ayurveda

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ABSTRACT

The knowledge about anatomical perspective of human body and its correlation with physiological functioning was established anciently by various traditional medical practitioners. The oldest *Vedic* systems also encompass some information related to human body and its functioning. The traditional ayurveda *Samhitas* described significant anatomical information about human body around 6th century BCE. The knowledge about anatomical aspect of various organs is very essential to treat ailments related to them. The sense organs *Netra* (eye), *Karna* (ear) and *Nasa* (nose) are very delicate therefore their anatomical consideration is very important while performing surgical intervention related to them. Considering these all aspects present article describes applied anatomical view on *Netra, Nasa* and *Karna.*

Keywords: *Ayurveda, Anatomy, Netra, Nasa, Karna.*

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INTRODUCTION

The *Vedic* period one of the oldest system of Indian civilization and the basic principles of Ayurveda resides inherent concepts of *Vedic* science. *Susruta Samhita* and *Charaka Samhita* are main context of Ayurveda medicine which provides enormous knowledge about diseases and their management. The *Susruta Samhita* written by ancient physician *Susruta* in 6th century, he emphasized anatomical structure and function of human body. The ancient text of ayurveda initially divided body into six parts (*Shadanga Shareera*) and mentioned that human body mainly composed of major organs and their subparts which described as *Anga* and *Pratyangas* respectively as per Ayurveda science.

The *Shiras* (head) and its subparts considered as superior (*Utthamanga*) since these organs control whole body. The various sense organs like; *Netra, Nasa* and *Karna* also resides in this region and anatomical abnormalities may causes ailments related to these sense organs **[1].** The ayurveda science described correlations of *Panchamahabhuta* with sense organs (*Netra, Nasa* and *Karna*). As per *Panchamahabhuta Siddhant; Netra* considered as action of *Akasha, Vayu, Agni, Jala* and *Rupagrahana,* while *Karna* can be considered as action of *Akashatatva* and *Shabdhagrahana* similarly *Nasa* can be correlated with action of *Akasha, Vayu, Agni, Jala, Prithvi* and *Gandhagrahana*.

The total four *Marmas* which are linked to eye, ear and nose. Thus we can say that there is specific internal anatomical correlation amongst sense organs; eye, ear and nose.

Present article described basic anatomical and physiological aspects of sense organs in a view to explore this area for future research.

NETRA (EYE)

The shape of eye can be described as *Suvrttam* and *Gostanakaram,* eye ball is round in shape projecting towards outer site. The overall circumference of eye is three and half *Angula,* antero posterior diameter is two *Angula,* vertical diameter two *Angula* and side to side horizontal dimension is two and half *Angula.* There is four *Angula* distance between two eyes **[12]**, total 38 *Siras* are described in eye and *Dhamani* that transmit visual perception and transport tears termed as *Rupavahini dhamani* and *Ashruvahi dhamanis* respectively. *Mandala, Sandhi* and *Patala* are main components of *Netra* **[13].**

As per Ayurveda visible parts of eye is *Netra Mandala;* arranged in concentric circles and traditional text described five types of *Mandala* i.e; *Dhrishti Mandals, Krishna Mandals, Sukla Mandals, Vartma Mandals* and *Pakshmamandalas*

Mandals. The width of all *Mandalas* or *Budbuda* is two and half *Angulas* and excluding *Vartma Mandala* it is two *Angula.* The *Dhrishti Mandala* is 1/7th of *Krishna mandala* which is 2.5 *Angula* in size.

Netra Sandhi can be described as joining area of *Netra mandalas. Pakshma, Sukla, Vartma, Krishna, Apanga* and *Kaninika* are various types of *Netra Sandhi* described in Ayurveda.

Patala means membrane of eye composed by *Teja* and *Jala Mahabhuta*, out of six two *Patala* are located in eye lids termed as *Bahya Patala* while remaining four are located inside the eye.

Anatomical consideration towards working of eye:

Indriyartha sannikarsha, Rupa alochanam and *Chakshu Buddhi* are physiological stages of eye. *Akshi bandhana* is internal parts of eye it contains *Kandara, Sira, Meda* and *Kapha* [15]. This part plays vital role in the functioning of eye when image travels through the light (*Jyoti*) then it moves towards *Akshi*, later on this process induces refraction inside the eye resulting *Dhrishti.*

Similarly *Rupa Alochanam* is the stage of images analysis, in which the process of receiving image (*Rupa grahana*) done by *Alochaka pitta* which is located in *Antah Taraka* of eye. *Chakshuvaisheshika* and *Buddhi vaisheshika* components of *Alochaka pitta* are involve in this process.

Akshigolaka the main component of eye receive image and convert perception to visual impact. *Lakshana, Rupa, Samsthana, Varna* and *Swara Pranipata* such type of information received by *Akshigolaka* and then transmit to *Chakshubuddhi* for visual perception **[20]**; here *Vata Dosha* play important role which acts as main functioning *Dosha,* however *Pitta* and *Kapha* resides in normal stage.

Anatomical and physiological abnormalities of eye:

The degenerative stage of ageing significantly affect capacity of *Akshigolaka*, *Netra Mandala* and *Chakshubuddhi* thus there is overall loss in *Dhrishti* in elderly person comparative to adult one. **[19].**

Anatomically there are three *Marmas* that are related to eye including *Apanga, Avarta* and *Sringataka*. *Apanga* is a *Sira marma,* located at the lower sides of the eye and half *Angula* in size **[16]**. *Avarta* is half *Angula* in size resides above eyebrows and described as *Sandhimarma.* It is believe that damage to *Apanga* and *Avarta Marmas* can result visual impairment or loss of vision **[17]**. *Sringataka* situated between two eye brows is described as junction of channels which nourishes sense organs; eye, ear and nose. Damage to this *Marma* can affect functioning of eye as well as other sensory organs like; ear and nose.

Similarly the damage to *Srotas* that is linked to eyes like; *Raktavahasrotas* can lead visual disturbances, redness of the eye can also observe as *Viddha lakshana* of *Raktavahasrotas.* [24].

KARNA (EAR)

Karna is one of the *Panchagyanendriya* and considered as *Adhisthana* for *Shrotrendriya.* The ear is described as organ which is responsible for hearing and balance. *Akasha* and *Shabdhagrahana* are described as *Indriya dravya* and *Indriya Buddhi* of *Karna.* In terms of *Mahabhuta Acharya Sushruta* considered *Karna* as action of *Akasha Mahabhuta* in *Bahirmukhasrotas. Acharya* has mentioned *Karna* and *Shankha* as a *Sandhi* while elaborating *Asti Sandhi Gandha.*

Anatomically external lobule of ear is termed as *Karnapali* (*Pinna*) while *Karna Peetha* is site of auricle. There is 5 *Angula* distance between *Karna* and *Apanga.*

Anatomically *Karna shaskuli* and *Karna putrak* are two parts of external ear, while *Chakrapani* described *Karna Gata Aavarta* and *Karna Putrak* as *Karnshushkuli.* One *Tarunasthi* and one *Sandhi* present in each ear. Ear contains two *Peshi,* ten *Siras* out of that two are *Vatavaha Sira*, two *Pittavaha Sira*, four *Kaphavaha sira* and two *Raktavaha sira.* There are two *Dhamanya* in ear and eight *Karnashrit Marma*.

Modern science described *Pinna* or auricle as external part of the ear, the tube which connects outer ear & internal ear is termed as external auditory canal. The membrane that divides external ear from the middle ear is called tympanic membrane that changes sound into vibrations. Malleus, Incus and Stape are three small bones that help to transmit sound waves. A canal that connects middle ear to the back side of nose is termed as eustachian tube. This tube balances pressure in the middle ear which is essential for proper transmission of sound waves. Cochlea part of inner ear contains nerves that help in process of hearing, Vestibule is another part of inner ear that containing receptors which help in balancing process.

Anatomical and physiological abnormalities of ear:

Inflammation in the middle or neuralgia affection to the outer ear can lead condition of "Earache" which induces symptom of pain.

The inflammation in middle ear can produces thick and yellowish discharge from ear and chronic condition of discharge may result deafness.

As per Ayurveda *Vata* vitiation can damage auditory nerve; situated at inner ear which resulting loss of hearing capacity and ringing in ear. Similarly damage to vestibular nerve can result vertigo. Infection to inner ear can lead allergies, inflammation and hearing impairment. Obstruction in auditory nerve can affect flow of nerve impulses.

There are total ten *Siras* in ear out of that two *Siras* are *Shabdavaha Sira* and injury to these *Shabdavaha Sira* can leads to *Badhirya.**{7}***

The *Vidhur Marma* is situated at posterio-inferiorly inside the ear; any trauma to this *Marma* can leads abnormal physiological functioning of ear. The *Sthana* of another *Marma; Shrungatak Marma* is *Talusthana* and any injury to this *Marma* can affect union of *Siras* or *Srotas* of ear, nose and eyes.

NASA (NOSE)

Nasa is one of the important *Panchagyanendriya* and considered *Adhisthana* for *Ghranendriya*. *Prithvi Gandha* is described as *Panchapanchaka Indriya dravya* for *Nasa.* It is believed that development of *Nasa* is occurs during the third month of gestation. *Acharya Sushruta* considered *Nasa* as action of *Prithvi Mahabhuta*. *Charaka* mentioned *Nasa* as *Ghranendria* as component of *Prithvi Dravya.*

Asthis are of *Tarunasthi, Acharya Charaka* described role of only one bone towards the bony structure of *Nasa* while *Acharya Sushruta* described three bones in *Nasa*. *Acharya Sushruta* mentioned that there is one *Sandhi,* three *Peshi* and two *Dhamani* present in *Nasa.*

Nasaputa prama is 1, 1/3rd or 2/3 rd *Angula* containing *Tarunasti* and three bones along with two *Peshi.* The length of *Nasika* is 2-1/3 *Angulas*. It composed of 24 *Siras* and 2

Dhamani that help in smell. The 24 *Siras* of nose further divided into four groups i.e; *Vatavaha, Pittavaha, Kaphavaha* and *Raktavaha Sira.*

The anatomical consideration towards the physiology of nose can be described in terms of *Nasa Indriya* and *Dhamanis*, the role of anatomical structure of nose towards its physiology can be depicted in **Figure 1** as follows:

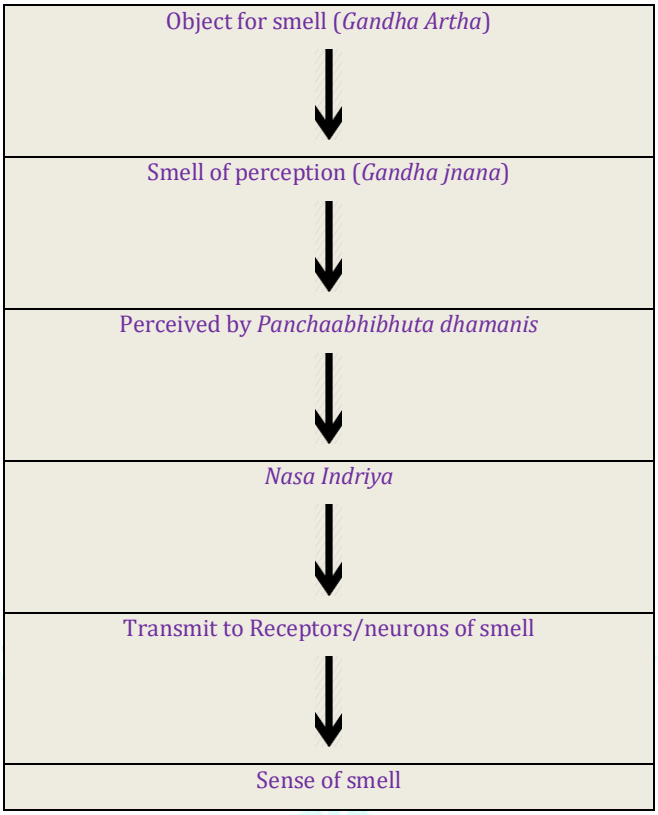

Figure 1: Role of nasal parts in physiological functioning of nose.

As per modern science the shape of external nose is pyramidal and it is made by bones and cartilages. Nasal septum divides nasal cavity into two halves which is lined by nasal mucous membrane, it is adhered to the periosteum.

Nasal cavity may be divided into sphenoidal, ethmoidal and frontonasal parts. Superior, middle and inferior nasal conchae are present as lateral wall. The lower part of nasal cavity is covered by respiratory mucosa while upper part lined by olfactory mucosa. Olfactory receptor neurons and basal cells are located in olfactory epithelium.

The frontal, ethmoidal, maxillary and sphenoidal sinuses help nasal cavity to communicate. Olfactory nerve fibers enter into cranial cavity and end as olfactory bulb. The temporal lobe of cerebral cortex provides space for ending of axons in the olfactory tracts.

Anatomical and physiological abnormalities of nose:

As per modern science the nasal mucosa cover and protect nasal path, any obstruction in nasal mucosa may lead nasal blockage and congestion that may also occur due to the allergy or nasal infection.

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