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PHARMACODYNAMICS OF NASYA KARMA

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ABSTRACT
Charaka explains that the senses and the channels carrying the sensory and motor impulses from the shiras are like the rays from the sun. Nasa (nose) is considered as one among the panchagnanendriya, whose functions are not only limited to olfaction and respiration but also considered as a pathway for drug administration. Since it is described as nose is the gateway for the shiras. Nasya karma is the special procedure where the drug is administered through that gateway. The medicine that is put into nostril moves in the channels up to the sringataka spreads to whole of the interior of the head and to the junction place where all the channels related to the eyes, ears, throat situated together i.e, saptapathi thus shows influence on shiras by removing out the accumulated dosas localised in shiras i.e., from all sinuses in the skull the action known as sirovirechana. The olfactory nerves are connected with the higher centers of the brain i.e., limbic system which contains amygdaloidal complex, hypothalamus, basal ganglia etc. so the drugs administered through nose stimulate the higher centres of brain which in turn effects the endocrine and nervous system functions ,by controlling the doshas. The drug administered even enters into the systemic circulation and also direct pooling into the intracranial region by both vascular and lymphatic path. Thus gives the desired effect of tarpana karma. Nasya karma not only acts as sirovirechana i.e., elimination of doshas and as shamana, controlling the dosas but also plays vital role in nourishing the panchagnanendriya adhistana located in shiras. The mode of action will be discussed in detail in the paper.
KEY WORDS: Nasa, Gateway, olfactory nerves, Tarpana, Sirovirechana

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INTRODUCTION

Nasya karma is a therapeutic procedure, where drugs are administered through nose in a specific manner, to cure different systemic disorders. It is different from ordinary nasal medication in the purpose of administration, method of administration and in the contents of the medicines administered. Ayurveda has given prime importance to shiras, considering it as one of the three principle vital organs of the body, where prana i.e., life resides and seat for all indriyas, hence considered as uttamanga.

"Sirasi indriyani indriya pranavahani cha srotamsi sooryamiva gabasthayah samsritani"[1]

The senses and the channels carrying the sensory and motor impulses from the shiras are like the rays from the sun. Nasa is considered as one among the panchaganendriya, whose functions are not only limited to olfaction and respiration but also considered as a pathway for drug administration. since it is described as gateway for the shiras. Nasya karma is the special procedure where the aushadha (drug) is administered through this pathway.

Etymological Derivation of Nasya

The word nasya is derived from 'NAS' dhatu. It conveys the sense of Gati-Motion (Nasa Gatau) and Vyapti means pervasion (Nasa Vyaptau). In Ayurvedic texts, Nasa Dhatu is used in sense of nose (Nasa Nasikayam). "Nasikayo hitan tatra bhavo va yat nasa desha"[2].The literary meaning of the word Nasya is being in the nose or the things beneficial to the nose. Vachaspatyam derives word 'Nastah' which means beneficial for the nose.

Definition of Nasya

In Ayurveda, the word nasya has been taken specifically to mention the root of administration of the drug. As stated by Sushruta, medicines or medicated oils administrated through the nose are known as nasya[3].

Mode of action of Nasya Karma

According to Charaka Nasa is the portal (gateway) of shiras. The drug administrated through nose as Nasya reaches to the brain and eliminates only the morbid doshas responsible for producing the disease. In Astanga Samgraha it is explained that nasa being the entry to shiras(head), the drug administrated through nostril reaches shringataka -a sira marma by nasa srotas and spreads in the murdha (Brain) reaches at a junctional place of netra (eye) , Srotra (ears), kantha (throat) siramukhas (opening of the vessels) etc and remove or detach the morbid doshas present above supraclavicular region and expel them from the uttamanga[4].

According to Charaka the recepie administered by nasya therapy enters into the head and draws out exclusively the morbid matter as the pith (isika) is taken out after removing the fibrous coating of munja (a type of grass) adhered to it[5].

Susrutha has explained sringataka marma as a sira marma, present in the middle of the confluence of siras supplying nourishment to the nose, ears, eyes and tongue fatal point at the confluence of veins (inside the head) by name "Sringataka"[6].Under the complications of nasya karma sushruta noted that the excessive eliminative nasal therapy (shodhana nasya) may cause mastulunga (C.S.F) to flow out, this shows the relation between the nasa as the gateway to shiras[7].

The pharmacodynamics of nasyakarma can be explained in light of modern anatomical and physiological studies as follows:

1) Neurological Pathway
2) Diffusion Method
3) Vascular Pathway

According to all Acharyas nasa is said to be the main entry of shiras. The nose is connected pharmacodynamically through vascular system and nerve plexus of olfactory nerve and ophthalmic and maxillary branches of trigeminal nerves to the brain.

NEUROLOGICAL PATHWAY

A great extent with association of olfactory stimuli, the major divisions of the olfactory tract leads directly to a portion of the amygdale called corticomedial nuclei that lies immediately beneath the cortex in the pyriform area of the temporal lobe.

The experimental stimulation of olfactory nerves causes stimulation in cells of hypothalamus and amygdaloidal complex. (Tonabe et al 1975). Electrical stimulation of hypothalamus in animals is capable of inducing secretions in the anterior pituitary.

The peripheral olfactory nerves are chemoreceptor in nature. The olfactory nerve differs from other cranial nerves in its close relation with the brain. The olfactory nerves are connected with the higher centers of brain i.e. limbic system, consisting mainly of amygdaloidal complex, hypothalamus, epithalamus, anterior thalamic nuclei parts of basal ganglia etc. so the drugs administrated here stimulate the higher centers of brain which shows action on regulation of endocrine and nervous system functions.

Thus Hypothalamus regulates

Control of autonomic nervous system: The hypothalamus controls and integrates activities of ANS, which regulates contraction of smooth and cardiac muscles secretions of many glands – Axons extend from the hypothalamus to sympathetic and parasympathetic nuclei in the brain stem and spinal cord. Through ANS, it is a major regulator of visceral activities includes heart rate, movement of food through the gastrointestinal tract and contraction of bladder.

Regulation of hormone synthesis:-The hypothalamus is considered to be responsible for integrating the functions of the endocrine system and the nervous system. It is known to have direct nerve connection with the posterior lobe of pituitary. In addition hypothalamus is connected with anterior lobe of pituitary through portal vessels which supply blood to the gland conveying chemical messages through inhibitory and releasing hormone.

Regulation of emotional and behavioral patterns: Together with limbic system participate in expression of rage, aggression, pain, pleasure and behavioral pattern relating to sexual arousal etc.

Regulation of eating and drinking through the arcuate and paraventrical nuclei and thirst centre thus regulating osmotic pressure.

Regulates body temperature

Regulation of circadian rhythm and states of consciousness

Effects of stimulating the amygdaloidal

In general, stimulation of amygdale can cause almost all the same effects as those elicited by direct stimulation of the hypothalamus.

Epithalamus consisting of pineal gland and habenular nuclei - pineal gland is a part of endocrine system, secreting melatonin and also contributes to the setting of the body's biological clock. Habenular nuclei – involved in olfaction, especially emotional responses to odors. Sub thalamus – contain the sub thalamus nuclei and portions

of the red nucleus and the substantianigra. These regions communicate with the basal ganglia help to control body movements[8a].

The drug administrated even enters into the systemic circulation and also direct pooling into the intracranial region by vascular path.

DIFFUSION OF THE DRUG

Lipid soluble substances have grater affinity for passive absorption through the cell walls of nasal mucosa. Thus navana nasya is superior to all the varieties.

"The cilia of the olfactory cells and perhaps the portions of the body of the olfactory cells contain relatively large quantities of lipid materials," this could explain why a substance must be lipid soluble to cause marked stimulation of an olfactory cell[9].

Non-polar hydrophobic molecules diffuse through the lipid bilayer of the plasma membrane, into and out of cells. Such molecules include oxygen, carbon dioxide and nitrogen gases; fatty acids, steroids, and fat soluble vitamins. It is a route of absorption of some nutrients and excretion of waste by body cells which are lipid soluble[8b]. Further drug absorption can also be enhanced by local massage and fomentation.

VASCULAR PATH

Vascular path transportation is possible through the pooling of nasal venous blood into the facial vein, which naturally occurs, at the opposite entrance, the inferior ophthalmic vein also pool into the facial vein.

"The facial vein has no valves. It communicates freely with the intracranial circulation, not only at its commencement and 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."[10]

Such a pooling of blood from nasal veins to venous sinuses of the brain is more likely to occur in head lowering position due to gravity, the absorption of drug into meninges and related intracranial organ is a point of consideration.

CONCLUSION

Keeping in the view of the above said facts, it can be concluded that either the essence (veerya) of the nasya or nasya dravya is reaching the brain and acting on important centers controlling different neurological, endocrine and circulatory functions and thus showing systemic effects.

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