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Review Article

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LITERATURE REVIEW ON "NASIYAM" (NASAL DROP) IN SIDDHA SYSTEM

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ABSTRACT

Siddha External medicine is classified into 32 categories. External therapy procedures are as important as in the management of Health and Disease. "NASIYAM" is a nasal drop application & one of the External applications in our Siddha external medicines. Nasiyam is a method of instilling liquid into both nostrils. In our Siddha system, many literatures say about Nasiyam treatment. Siddhar's used this method for many diseases, particularly kabham related disease, emergency purpose for anti- venom activity, fainting etc.., Nasiyam is a toxin removing process and its very helpful to get relax for head related problems. Medicines (solutions and oils) can also be administered into the nasal cavity by inhalation. The procedure should continue for about 20 seconds. To develop appropriate intranasal drug formulations, the physico-chemical characteristics, the cytoarchitecture and the mucociliary clearance of the nasal mucosa are important criteria. Hydrophilic drugs will pass mucus more easily than lipophilic drugs. The factors can be affecting to the physiochemical properties of the drugs, the anatomical and physiological properties of the nasal cavity and the type and characteristics of selected nasal drugs delivery system. IN delivery may be suitable for either topical or systemic delivery. The large surface area of the nasal mucosa affords a rapid onset of therapeutic effect, potential for direct to central nervous system delivery, no first-pass metabolism, and non-invasiveness; all of which may maximize patient convenience, comfort, and compliance.

KEY WORDS: ***Nasiyam, Kabham diseases, intranasal drug formulation, Drug delivery system, Topical or systemic delivery, Therapeutic effect.***

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1.Introduction

Siddha (Tamil “great thinker”; Sanskrit “perfected one”) is a term that is used widely in Indian religions and culture. It means “one who is accomplished”. It refers to perfected masters who have achieved a high degree of physical as well as spiritual perfection or enlightenment.

The siddha science is a traditional treatment system generated from Tamil culture. Palm manuscripts say that the siddha system was first described by lord Shivan to his wife Parvathi. Parvathi explained all this knowledge to her son lord Murugan. He taught all this knowledge to his disciple sage Agasthyar. Agasthyar taught 18 siddha’s and they spread this knowledge to human beings

Siddha defines mental health as a state of mental, intellectual and spiritual well-being. Our practitioners also identified a number of medicinal preparations and surgical procedures for curing various ailments and disease. Siddha emphasizes prevention of disease, rejuvenation of our body systems and extension of life span.

Siddha system of medicine is a vast repository of internal and external medicines. These procedures are as important as the internal medicines in the management of health and disease. According to the mode of application, Siddha system of medicine is a vast repository of internal and external medicines. includes certain forms of drugs and also certain applications (such as nasal, eye and ear drops), and also certain procedures (such as leech application). It is also classified into 32 categories. External therapy procedures are as important as in the management of Health and Disease. In several instances only the External therapy without any drug is sufficient and these procedures are already systematized. Most of these therapies are aimed at maintaining a healthy balance of three humours Vadham, Pitham and Kabam and also the seven tissue types of the body.

Siddha external therapies act as a powerful means to promote health equity, evidence of instant efficacy and safety and comparative cost effectiveness. The sources used in siddha external therapies are almost made from plant sources like leaves, roots and barks.

BACKGROUND

“NASIYAM” is a nasal drop application & one of the External applications in our Siddha external medicines. Nasiyam is a method of instilling liquid into both nostrils. It is done gently by instilling the drops one by one slowly. External medicines which are used as nasal drops are used in this type of treatment. In this, the raw drugs after being ground with herbal juices are made into a pill, tied in a cloth soaked in any herbal juice, mother milk etc. Individual oil or herbal juices or flower juices are also used for nasiyam. E.g: Peenisa thylam, flower juice of Leucas aspera or thumba

Siddhar's used this method for many diseases, particularly kabha related disease, emergency purpose for anti- venom activity, fainting etc.., Nasiyam is a toxin removing process and its very helpful to get relax for head related problems. The treatment not only helps in removing toxins from the head in removing toxins from the head, neck, brain, eyes, ear, nose and throat region, but also helps in bestowing a much needed nourishment and immunity to vital parts.

This therapy to treats kabam related disorder like headache, heaviness in the head, cold, and hoarseness of voice, nasal congestion and sinusitis. It is also effective for curing chronic diseases like cervical lymph and tumours. In our Siddha system, many literatures say about Nasiyam treatment. But now a day it is not properly used & lack of brief knowledge about this technique.

This project is to establish the complete collection of siddha literature books for nasiyam treatment and to improve our knowledge about nasal application method, treatment timing, dosage, water base nasal drops & oil base nasal drops, preparation and indications.

AIM & OBJECTIVE

To collect about nasiyam techniques like application method, treatment timing, dosage, water base nasal drops & oil base nasal drops, preparation (single drug & compound drugs), indications & contraindications.

2.Materials & Methods

STUDY TYPE:

Literature review

STUDY SETTING:

Library books in GSMC, Chennai and other available siddha text books

Research papers and article are available at standard websites.

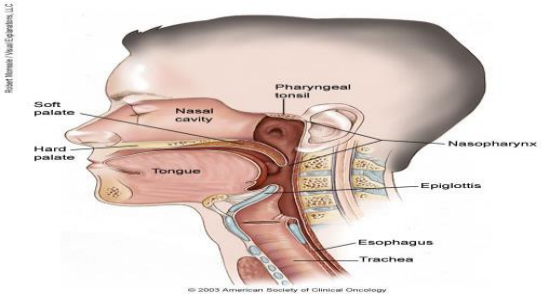
STUDY PERIOD:

3 Months

CLINICAL ANATOMY:

EXTERNAL NOSE (nasus externus): There are the external nose, the nasal cavity and the paranasal sinuses. The skeleton of the external nose is formed by bones and cartilages. The bony part of the nose is formed by paired nasal bones and by the frontal processes of the maxilla. The free ends of these bones form a piriform aperture. The cartilaginous framework of the nose includes triangular cartilages, paired alar cartilages and accessory cartilages. The triangular cartilages are continuous with the anterior edge of the nasal bones and the frontal processes of the maxilla. The skin on the external nose has many sebaceous and sweats glands. The upper narrow part of the nose is called the root. The dorsum (ridge) of the nose ends in a soft formation consisting of skin and subcutaneous cellular tissue. The lateral movable parts of the nose (alae) slightly protrude outside to form the nostrils, which together with the nasal septum, form the entrance (vestibule) to the nasal cavity. The inner part of the nostrils (about 4-5 mm) is covered with fine hair (cilia) and sebaceous glands.

The external nose is supplied with blood via branches of the ophthalmic artery. The blood outflows through the anterior facial and angular veins into the superior ophthalmic vein which communicates with the cavernous sinus.

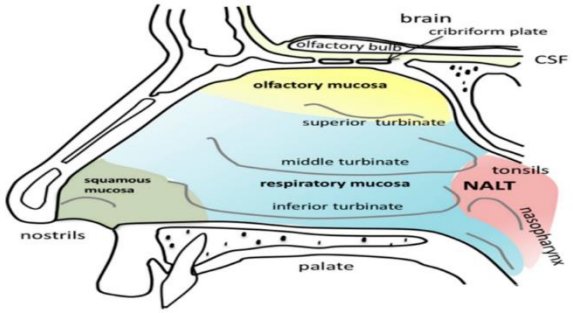


The lymphatic vessels of the external nose form a deep and superficial network; they anastomose with the lymphatic vessels of the face and drain into the parotid and submandibular lymph nodes.

The external nose is innervated by the fifth and seventh pairs of the cranial nerves.

NASAL CAVITY (cavum nasi): The nasal cavity is found in the middle of the upper facial part of the cranium. It includes the nasal cavity proper and the paranasal sinuses, lying superiorly, laterally, and posteriorly to the nasal cavity. The sinuses are frontal, ethmoidal, maxillary and sphenoidal. The nasal cavity is divided by the septum into the right and left parts, into which the paranasal sinuses and the cells of the ethmoidal labyrinth open. The anterior part of the nasal cavity opens with a piriform sinus (anteriorly) and choanae (posteriorly). The nasal cavity has four walls, namely the superior, inferior, internal and external walls.

The inferior wall (the floor) of the nasal cavity is the hard (bony) palate



The superior wall (the roof) of the nasal cavity includes the bone the nose anteriorly, the cribriform plate and cells of the ethmoid bone in the middle (the greater part of the roof) and the anterior wall of the sphenoidal sinus. The fibres of the olfactory nerve (whose bulb is found on the under surface of the cerebral hemisphere) and the branches of the ethmoidal artery and the veins pass through the perforations of the cribriform plate.

The medial (internal) wall or the septum consists of the anterior cartilaginous and posterior bony parts. The bony part of the septum is formed by the perpendicular plate of the ethmoid and the vomer. The cartilaginous part of the septum is a rectangular structure whose upper edge forms the anterior part of the dorsum. The nasal septum is usually slightly deviated to either of the sides. Significant deviation of the septum from its normal position can impair nasal respiration.

The lateral (external) wall of the nasal cavity has a more complex structure. Three nasal conchae extend

from the external wall toward the nasal septum: the superior, middle and inferior conchae. Three nasal meatuses (groove like passages) are distinguished accordingly: the superior, middle and inferior meatuses. The space between the nasal conchae and the septum, extending from the floor to the roof of the nasal cavity, is called the common nasal meatus. A nasolacrimal duct opens into the anterior part of the inferior nasal meatus.

The middle meatus contains a crescent- shaped semilunar hiatus where the maxillary and frontal sinuses, and also the anterior and middle cells of the ethmoidal labyrinth open. The posterior cells of the ethmoidal labyrinth open into the superior nasal meatus. A communication with the sphenoidal sinus is found somewhat superiorly.

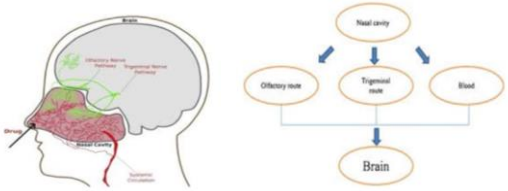
The nasal cavity is lined with the mucosa which is continuous with the mucosa of the paranasal sinuses, the pharynx and the middle ear. The nasal cavity can be divided into three parts; the anterior (vestibule), respiratory and the olfactory.

The respiratory part of the nasal cavity extends from the floor to the inferior border of the middle concha. The mucosa lining this cavity consists of multi-layered columnar ciliated epithelium rich in goblet cells, which produce mucus and serous glands producing serous or seromucous secretion. The mucosa of the concha overlies the cavernous tissue which can become engorged instantaneously, thus narrowing the nasal meatuses or on the contrary, become contracted.

The olfactory part of the nose is found in the superior regions of the nasal cavity; it extends from the inferior border of the middle concha to the roof. The mucosa of this part of the nasal cavity is lined with olfactory epithelium, with inclusion of islets of ciliated epithelium, which performs here the filtering function.

The nasal cavity is supplied with blood via the branches of the carotid arteries. The outflow of the blood is through the anterior facial and ophthalmic veins. The veins of the posterior parts of the conchae empty into the pharyngeal veins. The anterior part of the nasal septum has an area (Kiesselbach's area) which is usually covered with a small vascular varicosity. It is often called the bleeding area, because it is a common locus of nasal bleeding.

The lymph from the anterior parts of the nose flows into the submandibular lymph nodes; the lymph from the middle and posterior parts of the nose is drained into the deep cervical lymph nodes.



Three types of innervation are distinguished in the nasal cavity: the olfactory, sensory and secretory. The olfactory fibres (about 20) originate from highly differentiated cells and pass to the olfactory bulb through the cribriform plate. The sensory innervation of the nasal cavity is accomplished by the first and second branches of the trigeminal nerve.

The secretory innervation of the nasal cavity is represented by the sympathetic nervous system. The fibres of the sympathetic nerve pass from the pterygopalatine ganglion. They serve to communicate with the sympathetic nerves of the thoracic, abdominal and endocrine organs. All this establishes reflex connection between the nasal cavity and other organs and systems.

PARANASAL SINUSES: The paranasal sinuses are located by sides of the nasal cavity and communicate with it. There are four paired air cavities, namely the maxillary, cell of the ethmoidal labyrinth, frontal and sphenoidal.

The maxillary sinuses are located inside the maxilla; these are the largest paranasal sinuses. The external surface of the maxillary sinus has a depression which is known as the canine fossa. The medial wall of the maxillary sinus or the lateral wall of the nasal cavity has 2-3 opening at the level of the middle nasal concha, through which the sinus communicate with the nasal cavity.

The upper wall of the maxillary sinus is at the same time the inferior wall of the orbit. The alveolar process of the maxillary forms the lower wall (the floor) of the sinus. In most adults, the floor of the sinus is found below the floor of the nasal cavity. The posterior wall of the sinus is thick; it is formed by the maxillary tuberosity.

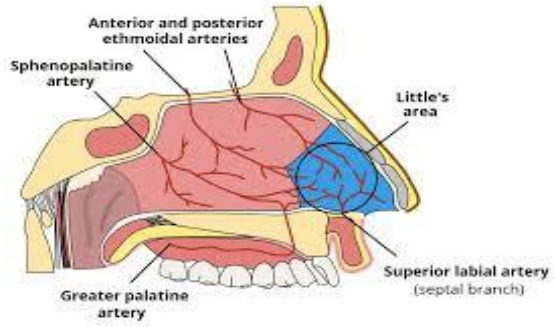
The ethmoidal sinuses (ethmoidal labyrinth) consist of air cells of the ethmoid which is located between the frontal and the sphenoidal sinuses. Anterior, middle and posterior cells of the labyrinth are distinguished (6-7 cells of each type on either side).In health man the cells are filled with air.

The frontal sinuses are found in the squama of the frontal bone. Each sinus has four walls: the anterior (facial), the posterior which borders with the cranial fossa; the inferior which in most cases is the superior wall of the orbit and borders with the cells of the ethmoid and the nasal cavity over a small area and the internal wall (the septum).

The sphenoid sinuses are found in the body of the sphenoid bone. The septum separating the sinuses extends anterior to the nasal septum.

A neonate has only two pairs of paranasal sinuses; the maxillary and the ethmoidal; these sinuses are only in their initial stage of development. The frontal and sphenoidal sinuses are absent in neonates; their formation begins only 3-4 years later. The topography of the paranasal sinuses approaches its final development by the age of 12.

The mucosa of the paranasal sinuses is continuous with the nasal mucosa but differs from the latter in thickness and the absence of the cavernous tissue.



The paranasal sinuses are supplied with blood through the branches of the external and internal carotid arteries. Blood drains through the veins that anastomose with one another and empty into the veins of the external nose, face, orbit, cerebral veins, venous plexuses and the cranial sinuses. The lymph outflow is directed to the retropharyngeal, submandibular and deep cervical nodes. The Paranasal sinuses are innervated by the first and second branches of the fifth pair of the cranial nerves. The sympathetic innervation originates from the pterygopalatine ganglion.

CLINICAL PHYSIOLOGY:

Nasal respiration is very important, because in addition to the respiration function, the nose also performs the protective, resonating and olfactory functions and is also involved in the regulation of respiration and lacrimation.

The respiratory function of the nose is part of the entire respiratory function in human. During inspiration, which is due to creation of negative pressure in the chest air enters both parts of the nasal cavity mostly through the respiratory part of the nose. The inspired air passes upwards and then descends by the superior and middle conchae and passes posteriorly to the choanae. The pressure of the air on the nasal mucosa excites the inspiratory reflex. If a subject breathes through his mouth, the inspiration becomes shallow and the amount of the air oxygen intake decreases; this in turn can cause a pathological effect on the nervous, vascular, circulatory and other systems of man (especially in children)

The protective function of the nose consists in warming the inspired air, its moistening and filtering. Cold air stimulates a rapid expansion of the cavernous sinuses and their filling with blood. The volume of the conchae thus increases significantly; their surfaces become enlarged as well and the nasal passages are narrowed accordingly.

The inspired air is moistened by the wet mucosa. As the air passes through the vestibule of the nose, large dust particles are retained by thick hairs. Fine dust and air-borne microbes, which pass first filter, are precipitated on the nasal mucosa moistened with mucosa secretion. Dust is also retained because the nasal passages are narrow and curved. About 40-60 per cent of dust particles and microbes inspired with air are retained in the nose and then removed from it with mucus. This function is performed by ciliated epithelium whose reciprocating movements propel the mucus toward the nasopharynx. When treating diseases of the nose it is necessary to remember that in addition to the therapeutic effect, prolonged instillation of liquid medicines into the nose can produce an adverse effect on the draining function of the ciliated epithelium. Prolonged administration of oil, soda, vasoconstrictive and other solutions should therefore be avoided whenever possible. Lysozyme, contained in the nasal mucus and secretion of the lacrimal gland has a marked disinfecting property.

The sneezing and lacrimal reflexes are also important protective mechanisms. Dust particles, cold, chemical, mechanical and other factors can stimulate these reflexes. The olfactory, trigeminal and facial nerves are involved in the reflex arc to stimulate contraction of the muscles of the face, trunk and the limbs.

The olfactory function in man is provided by the olfactory mucosa that contains the neuro-epithelial

fusiform olfactory cells, which are chemoreceptors. When the olfactory slit is narrowed or closed, respiratory hypo-osmia or anosmia develops. Defects of olfaction can also be caused by the affection of the nervous receptor cells in the presence of adequate nasal respiration. The molecules of gases, vapour, mist, dust or smoke stimulate the olfactory receptors. It should be noted that man can also perceive odour of some substances (e.g. spirit of ammonia) that act on the endings of the trigeminal nerve.

The resonating function of the nose accounts for the special timbre of the human voice. Pathological changes in the nasal cavity or in the nasopharynx (polyps, hypertrophy of the conchae, inflammation of the nasal mucosa, tumour, adenoids and other changes) cause rhinolalia clausa (nasal speech). If the nasal cavity has unusually large communication with the nasopharynx (e.g. due to the absence of the soft palate or its paralysis) the patient develops rhinolalia aperta.

GENERAL THERAPY AND NURSING:

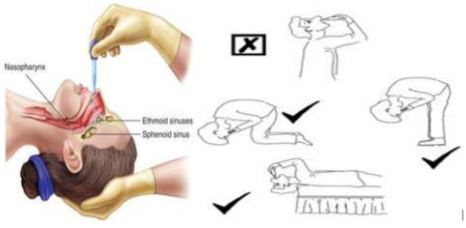
Diseases of the nose and its paranasal sinuses can be treated conservatively and surgically.

Conservative treatment includes instillation of various medicinal solutions, insufflation of powders, inhalation of various solutions of drugs and external application of ointments.

Surgical treatment includes cauterization of the mucosa with galvanic current and chemical substance, puncturing of the sinuses, extirpation of polyps, probing, removal of the conchae, resection of the distorted portion of the nasal septum, etc.,

Surgical operations on paranasal sinuses require special pre-operative treatment and postoperative care of the patient.

Nasal drops should be instilled with the patient in the lying position. The head should be dropped back and turned to the involved side. Adults are given 5 drops into each nostril; the dose for children is 3 drops in each side of the nose.



Powdered medicines are blown into the nose by special apparatus called insufflator.

Medicines (solutions and oils) can also be administered into the nasal cavity by inhalation. A glass rod (ophthalmic spatula) or cotton wool on an application is used to apply ointment to the vestibule of the nose. The patient should press the wing of the nose to the nasal septum and massage to distribute the ointment over the mucosa. The procedure should continue for about 20 seconds.

Removal of pathological contents from the nose by suction is another useful manipulation. A special aspirator or a rubber bulb should be used for the purpose. Special care should be exercised when removing nasal contents by suction in order to prevent possible damage to the nasal mucosa and subsequent bleeding.

Care of patient with pathology of the nose or paranasal sinuses that are treated conservatively is not difficult. The main duty of the nurse is to fulfil orders of the physician.

General Suitability of the Nasal Cavity for Drug Delivery:

Most types of nasal mucosa are involved in drug absorption, but interestingly, they differ in their delivery routes and their targeting compartment.

Any medical devices on the market that is able to specifically target only one delivery pathway. In addition, tailored mucoadhesive formulations have a huge potential to specifically target the desired type of nasal mucosa thereby enabling preferentially one drug route. To develop appropriate intranasal drug formulations, the physico-chemical characteristics, the cytoarchitecture and the mucociliary clearance of the nasal mucosa are important criteria.

The Nasal Epithelia:

Olfactory Mucosa:

The mucosa covering the olfactory region is composed of the neuronal cells detecting odorants in the inhaled air. The neurons are surrounded by either supportive cells in the epithelial layer or cells ensheathing the olfactory axons in the lamina propria on their way to the olfactory bulb. Basal stem cells ensure the recovery of olfactory mucosa after injury or tissue maintenance related cell death. Bowman's glands produce and secrete mucus.

Olfactory Sensory Neurons:

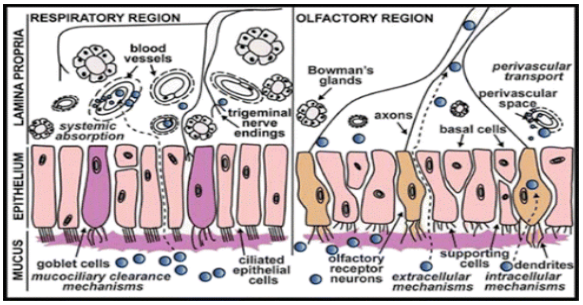
The olfactory nerve is the so-called first cranial nerve. The olfactory system is unique as the olfactory nerve shows some atypical features. Olfactory sensory neurons (OSN) are non-myelinated neurons

enwrapped by specialized ensheathing cells. Axons projecting from the olfactory nerve do not from a single bundle, as other nerves do. OSN form glomeruli, the so-called Fila olfactoria, which project in bundles to the olfactory bulb.

Olfactory Ensheating Cells:

Olfactory ensheathing cells (OEC) surround and isolate the olfactory axons from their origin in the epithelial membrane up to the lamina propria, where these axons form glomeruli with axons from matching OSN. In the outer layer of the olfactory bulb, olfactory ensheathing cells enwrap axonal bundles from OSN, where they defasciculate and finally terminate into olfactory bulb glomeruli.

The immunological function of OEC and of olfactory bulb glial cells needs to be considered when developing intranasal Nose to Brain biopharmaceuticals. If the drug enters the nervous system via the olfactory pathway there may be an activation of olfactory bulb microglia, which may lead to an inflammatory response throughout the brain. OEC induced immune response may also have an effect on the distribution and internalization of the drug.



Respiratory Mucosa:

About 80–90% of the human nasal cavity is covered with respiratory mucosa, which warms the inhaled air and does also take part in first line defence as it filters the air and removes particles such as allergens and microorganisms. The human respiratory mucosa is composed of various cell types and glands. Goblet cells, ciliated cells, intermediate cells, basal cells, serous glands, seromucous glands and intraepithelial glands can be found. Most of the nasal secretions are produced by the seromucous glands. Basal cells serve as progenitor cells in the respiratory mucosa. Like olfactory mucosa, respiratory mucosa is innervated by the trigeminal nerve.

Both, the large surface area and the high vascularity of the respiratory mucosa make it interesting for systemic drug application. It appears that CNS delivery via the respiratory mucosa is limited to the trigeminal nerve pathway.

Nasopharynx-Associated Lymphatic Tissue:

As all mucosal surfaces are in direct contact with pathogens, the mucosa-associated lymphoid tissue (MALT) is an important part of every mucosa to protect the organism from infections. The different MALTs are interconnected as the induction of an immune response at one mucosa may result in IgA production on another mucosal site in a different organ. MALT is even able to act independently of the systemic immune system. Immune responses of MALT are induced in secondary immune tissues, where antigen sampling is preceded beforehand. Nose specific MALT is called nasopharynx-associated lymphatic tissue (NALT). The site, where immune function is maintained, is composed of diffusively distributed lymphatic tissue along the lamina propria.

The mucosal immune system can be divided into the inductive and the effector sites: the inductive site is the region where antigen sampling occurs and lymphocytes are primed, while the effector site comprises mainly of the epithelial surface and the lamina propria where the immune cells perform their activity.

Microfold Cell:

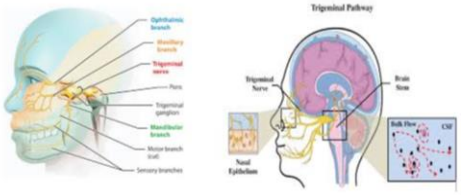
Microfold cell (M cells) is present in lymphoid follicle-associated epithelium. NALT resident M cells have a lifetime of weeks or even up to months. M cells are specialized cells for the phagocytosis and transcytosis of particles and antigens that are present in the mucus. They are also able to transport whole virus, bacteria or even parasites across the epithelium, but M cells themselves do not present exogenous antigens. Transmembrane transport by M cells is at least 50 times faster than the transport by their adjacent cells. Some bacteria and viruses have developed the ability to specifically use M cell transport to invade the host. M cells are also able to transcytose secretory IgA and IgA immune-complexes.

M cells are supporting the efficacy of intranasal vaccinations. Such intranasal vaccinations provide the benefit of systemic immunity without the need of parenteral injections. M cells are able to transcytose the immunogenic agents very fast and pass them to the underlying lymphatic tissue. Here, the immune cells are primed and a specific immunity against the vaccine is induced. To facilitate and speed up uptake, M cell

receptors may be specifically targeted by fusing the vaccine agent with receptor ligands. When developing intranasal delivery of therapeutic proteins, the interaction of the biopharmaceuticals with M cells in particular NALT in general needs to be carefully considered to avoid immunogenicity.

Trigeminal Nerve

OSN are not the only neurons invading the nasal mucosa. The trigeminal nerve is also innervating the olfactory and respiratory mucosa to a certain extent. Thus, chemical stimuli entering the nasal mucosa do not only interact with OSN, but also with trigeminal chemoreceptors. The trigeminal nerve is the fifth and largest of the cranial nerves and innervates the brain stem in the region of the medulla, pons and spinal cord, respectively. It has three branches, the ophthalmic, the maxillary and the mandibular one. The ophthalmic and the maxillary branches innervate the nasal cavity



The nasopalatine nerve, which is innervating the posterior portion of the nasal cavity, belongs to the maxillary branch, while the ethmoid nerve innervating the anterior nasal mucosa and external nasal surface belongs to the ophthalmic branch. In contrast to the axonal bundles of OSN, the trigeminal nerve is predominantly myelinated with Schwann cells. Non-myelinated branches of the trigeminal nerve innervate blood vessels of the olfactory mucosa to regulate blood flow. Trigeminal nerve endings are found in the nasal epithelium beneath the line of the tight junctions. Thus, trigeminal nerve endings are not penetrating the surface of the epithelium like OSN. Trigeminal innervation leads to sensory perception such as touch and pain. Solitary chemoreceptor cells are supporting the detection of water soluble irritants. Stimulation of trigeminal nerves by irritants is indicated by the sensation of stinging, burning or pain. It also activates protective reflexes such as increased secretions of nasal mucus or a decrease in size of the nasal passage. Cell bodies of trigeminal nerves are found on trigeminal ganglions.

Tight Junctions:

Like in all epithelia, tight junctions seal the space between the different apical cells and prevent exogenous molecules from entering the mucosa. Tight junctions are mainly composed by the protein occludin, the protein families claudin and zonula occludens. Tight junctions of the olfactory mucosa do not only prevent foreign particles from entering the CNS, they also provide a milieu for axonal growth thanks to the micro-compartmentalization of fila olfactoria. Tight junctions are able to compartmentalize axonal bundles by adjusted leakiness and thus may take part in an environment for axonal regrowth Cell-cell connections like tight and adherence junctions decrease the permeability of drugs through the mucosa. Nevertheless, their presence does not directly reflect the permeability of the mucosa. Despite the presence of tight junctions, the nasal epithelia provide a low transepithelial electrical resistance (TEER) and a good permeability for drugs. Manipulation of tight junctions forming the blood-brain barrier is discussed to facilitate drug delivery into the CNS. But a leaky blood-brain barrier did not only enhance drug delivery, but also the risk of CNS infection and may lead to severe side effects as the increased risk of brain oedema. In parallel, manipulation of tight junctions in the olfactory mucosa may also cause irreversible damage. One of the substances with an apparent limited risk is papaverine, a vasodilator with time dependent reversible effect on tight junctions.

Cilia and Mucus Transport:

There are two types of cilia known, the motile and the non-motile ones. Non-motile as well as motile cilia share a common scaffold. They consist of a skeleton called the axoneme made up of hundreds of proteins. The interior of the axoneme is composed of nine peripheral microtubules. These microtubules are arranged in a cartwheel like formation and consist of doublets, composed of A and B tubules. The cilial beat pattern consists of two phases, the effective stroke and the recovery stroke. The effective stroke counters viscose resistance and propels the mucus, respectively. The recovery stroke brings the cilium back to its starting position.

Nearly 80% of the cells of the respiratory mucosa are covered with motile cilia. In the lower airways over 99% of the cells are ciliated, while in olfactory mucosa only non-motile cilia are found.

However, smaller patches and islets of respiratory mucosa can be found in the olfactory mucosa. Such respiratory islets contain motile cilia and support the mucociliary clearance of the olfactory region.

Mucus Permeability and Turnover:

Effective drug formulations developed for intranasal administration should therefore penetrate the nasal mucus and adhere to the local epithelium to minimize mucocilliary clearance. Permeability of mucus depends on the properties of the invading substance, mucus thickness as well as mucus consistency. Once the mucus is passed, the nasal epithelium provides a rather good permeability.

It is thought that small particles like protein degradation products and viruses move quite freely in mucus. Mesh space of mucin ranges from 20 to 200 nm and is clearly wide enough for small molecules and particles, while bigger particles are slowed down by the mesh. Hydrophilic drugs will pass mucus more easily than lipophilic drugs.

Interactions between molecules and mucus are crucial, known from the IgM-mucus interaction. IgM is so small it could pass mucus freely, but in cervix mucus it is nevertheless slowed down due to low affinity bonds occurring between mucus and Fc domain of IgM antibodies. Mucosal interaction with the Fc domain of antibodies results in reduced transport rate and enables thereby the antibodies to trap pathogens which otherwise would diffuse through mucus freely. A similar interaction with Fc domains needs to be elucidated as it could interfere with intranasal delivery of monoclonal antibodies. Thickened mucus slows mucus clearance. This in turn leads to increased residence time for bacteria to penetrate mucus barrier and simultaneously impairs immune cell immigration and killing performance.

An increase of mucoadhesion is thought to increase drug uptake and hence bioavailability by prolonging the residence time in the mucus. Another approach is to increase the adhesion to epithelial cells layer, but it should be noted that drug or particulate formulation with encapsulated drugs have first to pass the mucus to adhere to the epithelium. The nasal mucus layer is considerably thinner than the intestinal mucosal layer, the problem of permeating the mucus layer is less pronounced for intranasal delivery.

A secretion of 20 to 40 mL of nasal mucus was reported under normal conditions per day. The mucus is propelled by motile cilia of the epithelial cells to the nasopharynx where it is swallowed and subsequently digested. The clearance of pathogens is dependent of mucus degradation. The thickness of the mucus layer depends on the rates of secretion and its degradation. Even unpropelled mucus is automatically renewed by continuous mucus secretion.

Physico-Chemical Properties:

Mucus can be divided into two different layers, the pericilliary layer adjacent to the epithelial cells and the upper gel like layer. Pericilliary layer is of low viscosity and reaches nearly as high as the tips of motile cilia. Mucus displays non-Newtonian properties. This means it possesses viscous (fluid) and elastic (solid) properties, termed viscoelastic. If shear stress is applied to mucus, its viscoelasticity ensures decreasing viscosity with increasing shear stress. Recovery of mucus is only partially after removing stress. Mucus is a dynamic, semipermeable gel as it contains not only glycoproteins, but also inorganic salts, lipids, scraps of DNA, other proteins such as immunoglobulins, enzymes and debris. Several data indicate a mucosal pH from 5.5 up to 7.8 in the nose. On average nasal mucus is cleared every 10 to 20 min. Cilia are only able to transport mucus with appropriate viscoelasticity. If mucus is too slippery it cannot be propelled by cilia and drips out of the nose or down the lungs, respectively. If it is on the other hand too viscous and sticky, it will not be propelled either.

MECHANISM OF NASAL ABSORPTION

1. First mechanism

It involves an aqueous route of transport, which is also known as the Para cellular route but slow and passive. There is an inverse log-log correlation between intranasal absorption and the molecular weight of water-soluble compounds. The molecular weight greater than 1000 Daltons having drugs shows poor bioavailability.

2. Second mechanism

It involves transport through a lipoidal route and it is also known as the transcellular process. It is responsible for the transport of lipophilic drugs that show a rate dependency on their lipophilicity. Drug also cross cell membranes by an active transport route via carrier mediated means or transport through the opening of tight junction

FACTORS INFLUENCING NASAL DRUG ABSORPTION

Several factors affect the systemic bioavailability of drugs which are administered through the nasal

route. The factors can be affecting to the physiochemical properties of the drugs, the anatomical and physiological properties of the nasal cavity and the type and characteristics of selected nasal drugs delivery system.

These factors play key role for most of the drugs in order to reach therapeutically effective blood levels after nasal administration.

1) Physiochemical properties of drug
   Molecular size.
   - Lipophilic-hydrophilic balance.
   - Enzymatic degradation in nasal cavity.

2) Nasal Effect
   - Membrane permeability.
   - Environmental pH
   - Mucociliary clearance
   - Cold, Rhinitis.

3) Delivery Effect
   - Formulation (Concentration, pH, osmolarity)
   - Delivery effects
   - Drugs distribution and deposition.
   - Viscosity

1) Physiochemical properties of drug

Molecular size

The molecular size of the drug influence absorption of the drug through the nasal route. The lipophilic drugs have direct relationship between the MW and drug permeation whereas water soluble compounds depict an inverse relationship. The rate of permeation is highly sensitive to molecular size for compounds with MW ≥ 300 Daltons.

Lipophilic-hydrophilic balance

The hydrophilic and lipophilic nature of the drug also affects the process of absorption. By increasing lipophilicity, the permeation of the compound normally increases through nasal mucosa. Although the nasal mucosa was found to have some hydrophilic character, it appears that these mucosae are primarily lipophilic in nature and the lipid domain plays an important role in the barrier function of these membranes.

Enzymatic degradation in nasal cavity

In case of peptides and proteins are having low bioavailability across the nasal cavity, so these drugs may have possibility to undergo enzymatic degradation of the drug molecule in the lumen of the nasal cavity or during passage through the epithelial barrier.

2) Nasal effect factors

Membrane permeability

Nasal membrane permeability is the most important factor, which affect the absorption of the drug through the nasal route. The water soluble drugs and particularly large molecular weight drugs like peptides and proteins are having the low membrane permeability. So the compounds like peptides and proteins are mainly absorbed through the endocytotic transport process in low amounts.

Environmental pH

The environmental pH plays an important role in the efficiency of nasal drug absorption. Small water-soluble compounds such as benzoic acid, salicylic acid, and alkaloid acid show that their nasal absorption in rat occurred to the greatest extent at those pH values where these compounds are in the nonionised form.

Mucociliary clearance

Mucociliary clearance is a one of the functions of the upper respiratory tract is to prevent noxious substances (allergens, bacteria, viruses, toxins etc.) from reaching the lungs. When such materials adhere to, or dissolve in, the mucus lining of the nasal cavity, they are transported towards the nasopharynx for eventual discharge into the gastrointestinal tract.

Cold, Rhinitis

Rhinitis is a most frequently associated common disease, it influence the bioavailability of the drug. It is mainly classified into allergic rhinitis and common, the symptoms are hyper secretion, itching and sneezing mainly caused by the viruses, bacteria or irritants.

3) Delivery effect factors

Factors that affect the delivery of drug across nasal mucosa such as surfactants, dose pH, osmolarity, viscosity, particle size and nasal clearance, drug structure can be used to advantage to improve absorption.

i) Formulation (Concentration, pH, Osmolarity)

The pH of the formulation and nasal surface, can affect a drug's permeation. To avoid nasal irritation, the pH of the nasal formulation should be adjusted to 4.5–6.5 because lysozyme is found in nasal secretions, which is responsible for destroying certain bacteria at acidic pH. Under alkaline conditions, lysozyme is inactivated and the tissue is susceptible to microbial infection. In addition to avoiding irritation, it results in

obtaining efficient drug permeation and prevents the growth of bacteria.

Concentration gradient plays very important role in the absorption / permeation process of drug through the nasal membrane due to nasal mucosal damage.

The osmolarity of the dosage form affects the nasal absorption of the drug; it was studied in the rats by using model drug. The sodium chloride concentration of the formulation affects the nasal absorption. The maximum absorption was achieved by 0.462 M sodium chloride concentration; the higher concentration not only causes increased bioavailability but also leads to the toxicity to the nasal epithelium.

ii) Drugs distribution and deposition

The drug distribution in the nasal cavity is one of the important factors, which affect the efficiency of nasal absorption.

The mode of drug administration could affect the distribution of drug in nasal cavity, which in turn will determine the absorption efficiency of a drug. The absorption and bioavailability of the nasal dosage forms mainly depends on the site of disposition. The anterior portion of the nose provides a prolonged nasal residential time for disposition of formulation, it enhances the absorption of the drug. And the posterior chamber of nasal cavity will use for the deposition of dosage form; it is eliminated by the mucociliary clearance process and hence shows low bioavailability.

iii) Viscosity

A higher viscosity of the formulation increases contact time between the drug and the nasal mucosa thereby increasing the time for permeation. At the same time, highly viscous formulations interfere with the normal functions like ciliary beating or mucociliary clearance and thus alter the permeability of drugs.

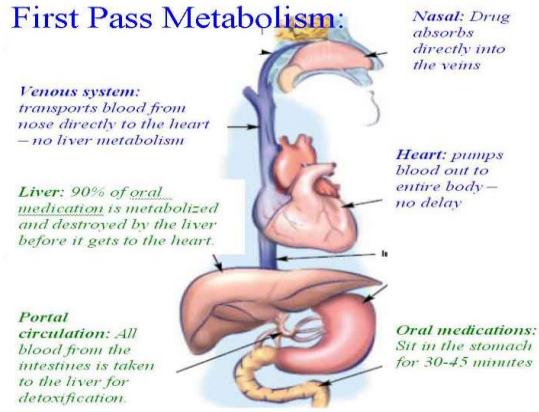
THERAPEUTIC CONSIDERATIONS

1. Local delivery

IN is a logical delivery choice for local (or topical) treatment. Prominent examples are decongestants for nasal cold symptoms, and antihistamines and corticosteroids for allergic rhinitis.

2. Systemic delivery

Positive attributes of IN systemic delivery include a relatively large surface area for drug absorption, rapid drug onset, no first-pass metabolism, and non-invasiveness to maximize patient comfort and compliance. Specific pharmacokinetic attributes of IN delivery are reviewed elsewhere. As discussed in the various case studies below, IN administration provides an alternative route for systemic delivery of drugs more conventionally delivered by oral or (for poorly orally absorbed compounds such as peptides and proteins) injection routes.

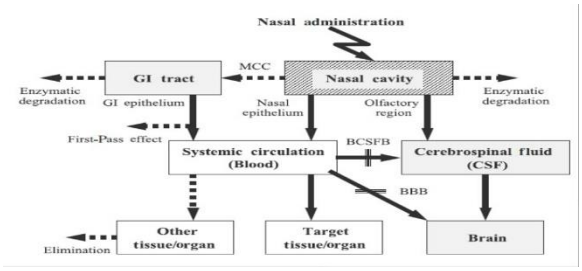


3. Vaccine delivery

The nasal mucosa has received some attention as a vaccination route. Presentation of a suitable antigen with an appropriate adjuvant to the nasal-associated lymphoid tissue (NALT) has the potential to induce humoral and cellular immune responses. This approach may be a particularly effective approach to achieving rapid mass immunization. IN immunization may lead to development of local, as well as systemic, immunity. An example of an IN vaccine is a cold adapted live influenza virus. This product is given as one or two doses over the influenza season via a syringe sprayer.

4. Nose to brain delivery

In delivery of drugs targeting the central nervous system (CNS) is currently an area of great interest, as reviewed elsewhere.



Possible routes of transport between the nasal cavity and the brain and CSF.

The blood–brain barrier (BBB), segregating the brain interstitial fluid from the circulating blood, and the blood– cerebrospinal fluid barrier (BCB), separating the blood from the cerebrospinal fluid

(CSF) that encircles the brain, provide efficient barriers to the diffusion of drugs from the blood stream into the central nervous system (CNS) especially of polar drugs such as peptides and proteins. Hence, these barriers prevent the utilization of many novel therapeutic agents, for example neuropeptides, for treating CNS disorders such as Parkinson's and Alzheimer's diseases. It has been shown in animal and in human studies that after nasal administration drugs can be transported directly from the nasal cavity to the CNS via the olfactory epithelium and/or the trigeminal nerve system thereby bypassing the BBB and the BCB.

BENEFITS:

1) Drug degradation that is observed in the gastrointestinal tract is absent.
2) Hepatic first pass metabolism is avoided.
3) Rapid drug absorption and quick onset of action can be achieved.
4) The bioavailability of larger drug molecules can be improved by means of absorption enhancer or other approach.
5) The nasal bioavailability for smaller drug molecules is good.
6) Drugs that are orally not absorbed can be delivered to the systemic circulation by nasal drug delivery.
7) Studies so far carried out indicate that the nasal route is an alternate to parenteral route, especially, for protein and peptide drugs.
8) Convenient for the patients, especially for those on long term therapy, when compared with parenteral medication.
9) Drugs possessing poor stability in g.i.t. fluids are given by nasal route.
10) Polar compounds exhibiting poor oral absorption may be particularly suited for this route of delivery.

LIMITATIONS:

1) The histological toxicity of absorption enhancers used in nasal drug delivery system is not yet clearly established.
2) Relatively inconvenient to patients when compared to oral delivery systems since there is a possibility of nasal irritation.
3) Nasal cavity provides smaller absorption surface area when compared to GIT.
4) 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.
5) Certain surfactants used as chemical enhancers may disrupt and even dissolve membrane in high concentration.
6) There could be a mechanical loss of the dosage form into the other parts of the respiratory tract like lungs because of the improper technique of administration.

NASIYAM OTHER NAME:

நசியம் பிழிதல், நாசியிலுறையப் பிழிதல், மூக்குத்துளி, மூக்குறிஞ்சல், மூக்கிலூற்றல், மூக்குப்பிழி மருந்து.

DOSAGE:

The advisable dosage of nasiyam is in our siddha text, one drop per nostril.

SELF- LIFE:

The prepared nasal drop medicines self-life is one year.

TREATMENT TIMING:

The ideal timing for the application of "NASIYAM" based on thiridosam concept is,

1. Morning - Kabam diseases
2. Mid noon - Pitham diseases
3. Evening - Vatham diseases

NOTE: Nasiyam is not done, if patient in fasting, dysentery, after food intake & during the rainy season.

NASIYAM (NASAL DROPS) MEDICINES IN SIDDHA SYSTEM:

NASIYAM FOR PEENISAM: (AGATHIYAR PALLU 200, Pg no: 38)

INGERIDIENTS

1) MELAGU THOOL - 2 ½ VARAAGAN (8 ¾ GRAM)
2) INDUPPU THOOL - 2 ½ VARAAGAN (8 ¾ GRAM)
3) CHUKU THOOL - 2 ½ VARAAGAN (8 ¾ GRAM)
4) VAAIVILANGA THOOL - 2 ½ VARAAGAN (8 ¾ GRAM)
5) GANJA THOOL - 2 ½ VARAAGAN (8 ¾ GRAM)
6) COW'S GHEE – 10 PALAM(350 GRAM)

PREPARATION:

The above said ingredients except cow's ghee are grinded well with cow's milk. Then it is mixed with cow's ghee and boiled. After a few minutes the ghee is filtered and preserved in an air tight container.

INDICATION: 1- 2 drops of ghee is used as nasal drops, two times in a day for Mandai vali, Peenisa noi.

AADATHODAI ENNAI FOR PENNISAM: (THANVANTHIRI VAITHIYAM; Pg no- 424)
INGREDIENTS:
1) AADATHODAI SAARU- 1 SAER
2) AGATHI ELAI SAARU- 1 SAER
3) PASU MANJAL SAARU- 1 SAER
4) NOCCHI SAARU- 1 SAER
Above said leaf extracts are mixed well and
5) KADUGU- ½ PALAM
6) MELAGU- ½ PALAM
7) KARIUPPU- ½ PALAM
8) POONDU- ½ PALAM
9) SUKKU- ½ PALAM

Above said raw drug are made in to fine powder and grinded with butter milk then mixed with leaf extracts and Veppennai (5 saer) and boiled until it attains the ennai patham. Filtered and kept in an air tight container.
USAGE: 2 drops of oil is used as nasal drops
INDICATION: Peenisam, Kabaala Rogam.

SUDAR THYLAM FOR PENNISAM: (THANVANTHIRI VAITHIYAM; Pg no: 425)
INGREDIENTS:
1) PURIFIED PATHARASAM
2) PURIFIED GANDAGAM
3) PURIFIED LINGAM
4) PURIFIEDTHAALAGAM
EQUAL QUANTITY
5) PORITTHA SANGU
6) KUNDIRIKKAM
7) PURIFIED VELLAI PAASHAANAM
PREPARATION:

The above said drugs are powdered and spreader in cotton cloth then rolled. The cloth is dipped in cow's ghee and fired then ghee is added drop by drop above the firing flame. After a few minutes oil is collected from the firing flame. Oil is filtered and preserved.
INDICATIONS:

The oil is administered as nasal drops for Peenisam.

NASIYAM FOR SURANGAL: (AGATHIYAR PALLU 200, Pg no: 38)
INGREDIENTS:
1) SITTRAMANAKKU PARUPPU- 2 ½ VARAAGAN
2) MELAGU THOOL- 2 ½ VARAAGAN
3) ARISI THIPPILI THOOL- 2 ½ VARAAGAN
4) INDUPPU THOOL- 2 ½ VARAAGAN
5) VELLAI POONDU IDHAZHL- 2 ½ VARAAGAN
6) VELIPPARUTHI SAARU- QS
7) PAAGAL ELAI SAARU- QS
PREPARATION:

The above said drugs is grinded for one hour and mixed well then velipparuthi saaru mixed and grinded for 1 saamam(3 hours) them it is dried. Again the dried powder is mixed with paagali elai saaru and grinded for 1 saamam and prepared as tablets.
INDICATIONS:

The tablet is rubbed with breast milk in dose of 2 arisi yadai and used as nasal drops for all kinds of fever.

(AGATHIYAR VAITHTHIYA VALLAATHI- 600; Pg no: 85)
INGREDIENTS:
1) KOSTTAM – 1 VARAAGAN
2) ELAM - 1 VARAAGAN
3) KUMKUMA POO - 1 VARAAGAN
4) LAVANGA PATTAI - 1 VARAAGAN
5) ATHIMADURAM - 1 VARAAGAN
6) KARUNJEERAGAM - 1 VARAAGAN
7) LAVANGA PATTHIRI - 1 VARAAGAN
PREPARATION:

All drugs are grinded with araikaal padi (1/8 paadi) cow's milk. Then it is mixed with maadulam poo saaru (1/8 paadi) and cows ghee (1/8 paadi) and boiled, till it gets mezhuku patham.
INDICATION:

This oil used as nasal drop for six types of Peenisam, Thalaikkuthu due to Pitham, Kan sevappu, Kan vatham, Neer pillam, Kan erichal. This oil is mixed with honey and heated in low flame and applied as Thaarai for eye diseases.

(THERAYAR VAAGATAM; Pg no: 12)
FOR THODA SURAM:

Pepper powder mixed with castor oil and used nasal drops
FOR SANNI SURAM, THODA SURAM:

Thippili powder mixed with Velipparuthi saaru and used as nasal drops.
FOR ALL TYPES OF THODA SURANGAL:

Equal quantity of Induppu and Vellai Pundu thiri is grinded with Paagal elai saaru and used as nasal drops

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NASIYAM FOR SANNI THODAM: (AGATHIYAR PALLU 200, Pg no: 60)

INGREDIENTS:

1) NENNOCCHI KOZHUNTHU – 2 ½ VARAAGAN (8 ¾ gram)
2) PUNGAN KOZHUNTHU - 2 ½ VARAAGAN (8 ¾ gram)
3) MELAGU THOOL - 2 ½ VARAAGAN (8 ¾ gram)
4) THOL URITHA VELLAI PUNDU - 2½ VARAAGAN (8 ¾ gram)

PREPARATION:

Above four drugs is crushed well and extracted, then equal quantity of cows urine is mixed.

DOSE: 1-2 drops, two times per day

INDICATION: All types of Sanni (Kalappu Noi)_____

NASIYAM FOR VALIPPU: (AGATHIYAR VAITHTHIYA VALLAATHI- 600; Pg no: 97)

INGREDIENTS:

1) VELLAI PUNDU – 1 PANGU
2) ELUPPAI PINNAAKKU - 1 PANGU
3) VASAMBU - 1 PANGU

PREPARATION:

Drugs are grinded and mixed with Avuri elai saaru.

DURATION: 7 days morning and evening used as nasal drops.

INDICATION: 12 types of Valippu

[Murungai veer pattai and ginger is mixed with above medicine and grinded with breast milk and used as nasal drop for Sanni]

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NASIYAM FOR SIRA ROGAM: (THANVANTHIRI VAITHIYAM; Pg no: 423)

INGREDIENTS:

1) SAARANAI KIZHANGU
2) INDUPPU
3) MELAGU
4) SUKKU
5) SAMUTHIRAA PAZHAM

PREPARATION:

Above drugs is mixed with water and crushed then filtered in white cloth and used as nasal drops

INDICATION: Siro Viyadhigal

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NASIYAM FOR KABAALA ROGAM: (THANVANTHIRI VAITHIYAM; Pg no: 424)

INGREDIENTS:

1) COWS GHEE – ¼ PADI
2) PUNDU – 40 KUNDRI
3) ATHIMATHURAM – 40 KUNDRI
4) PULIYANKOTTAI THOL – 40 KUNDRI
5) THURUSU – 40 KUNDRI
6) KARUNJEERAGAM – 40 KUNDRI
7) JEERAGAM - 40 KUNDRI
8) PREPARATION:

All raw drugs are powdered and mixed with cow's ghee and boiled then filtered and used as nasal drops.

INDICATION: Kabaala Rogam, Mandai Soolai_____

THANVANTHIRI VAITHIYAM; Pg no: 425

PREPARATION:

A piece of camphor is powdered a mixed with coconut oil whenever necessary the oil is heated in low flame and used as nasal drop

INDICATION: Kabaala Pinigal

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NASIYAM FOR PAAMBUKKADI NANJU MURIVU: (NANJU MARUTHUVAM; Pg no: 657)

INGREDIENTS:

1) VASAMBU
2) VENGAYAM
3) PERUNGAYAM
4) NERVALAM
5) ARITHARAM
6) GANTHAGAM PREPARATION:

Equal quantity of above drugs is grinded with avuri saaru, utthamani saaru, kuppaimeni elai saaru then urine is added and grinded.

INDICATION: Used as Nasal drop for Paambu Nanju Murivu

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SINGLE DRUG NASIYAM PREPARATIONS:

1. The extract of the sesbania grandiflora (agathi) is used to treat naangam murai kaaicchal.
2. The extract of the sesbania grandiflora (agathi) is mixed with honey in the ratio of 1:5 and useful in treatment of neerkovai and head ache.
3. The juice of arugam pull (cynodon dactylon) arrest nasal bleeding.
4. The stem of indu(mimosa rubicaulis) is cut and blowed. 1-2 drops of juice is effective in the treatment of mooku neeratram, mandai kudaichal,

muga vali, vazhi thadippu, vellai, suthaga vaayu, soolai.

5. The leaf of acalypha indica (kuppai meni) is mixed with salt and extracted. 2 drops of juice is given for veri nooi.

6. Fruit of kurattai (trichosanthes tricuspidata) is crushed and mixed with coconut oil and boiled this oil is useful to cure nasal wound.

7. Leaf juice of annona squamosa (seetha) helps to relieve moorchai vali.

8. 1-2 drops of Thazhuthalai (clerodendrum phiomoidis) leaf extract is used to cure fever.

9. Leucas aspara (thumbai) flower extract helps to relieve moorchai due to snake bite.

10. Leucaus aspara (thumbai) flower extract is also useful in treatment of thiraatha thalai vali.

11. Nayuruvi(achyranthes aspera) ash thelineer 4000 gram, nayuruvi ash 250 gram is mixed with gingelly oil is boiled and filtered. The filtered oil arrest nasal bleeding.

3.Results

From the various Siddha literatures we can understand that Siddhar's consider "NASIYAM" as a good treatment and also is used as preventive aspect. Not only to cure disease. Nasiyam effective in first aid treatment and protects the body in healthy manner. Comparing traditional siddha system with scientific aspect and performing various researches about siddha external medicines would be very helpful in development of siddha system. As the Nasiyam medicine is in water consistency or oil consistency, it can be easily penetrate. According to scientific aspect, water consistent medicine is much better than the medicine in powder form. As the nasiyam medicines directly mixed with in the blood, so it is used as an emergency medicine by Siddhar's. The common dosage for the nasal drops as indicated in our literature is+ 1 to 2 drops which has mentioned below.

NO	NASIYAM AND DISEASES	DOSAGE
1)	Nasiyam for Sannithodam	1-2 drops
2)	Nasiyam for Peenisam	1-2 drops
3)	Aadathodai ennai for Peenisam	2 drops
4)	Indu steam extract for Mooku Neeratram, Mandai Kudaichal, Muga Vali, Suthaga Vaayu, Soolai.	1-2 drops
5)	Kupphai meni leaf extract for Very Nooi	2 drops
6)	Thazhuthaazhai leaf extract for Suram	1-2 drops

4.Discussion

Siddha medicine has a history of 2000 years, siddha external therapy is one of the main pillars, which is not yet validated even though at basic level research. We really wondered and amazed about the deep knowledge of our Siddhar's and their care of humanity and realized that external therapies are boon to our health care system where ever we used the therapies in our clinical practise and collecting the data from siddha texts. "NASIYAM" is a useful delivery method for drugs that are active in low doses and show no minimal oral bioavailability such as proteins and peptides. One of the reasons for the low degree of absorption of peptides and proteins via the nasal route is rapid movement away from the absorption site in the nasal cavity due to the mucociliary clearance mechanism. The nasal route circumvents hepatic first pass elimination associated with the oral delivery: it is easily accessible and suitable for self-medication. IN delivery may be suitable for either topical or systemic delivery. The large surface area of the nasal mucosa affords a rapid onset of therapeutic effect, potential for direct to central nervous system delivery, no first-pass metabolism, and non-invasiveness; all of which may maximize patient convenience, comfort, and compliance. IN delivery is non-invasive, essentially painless, does not require sterile preparation, and is easily and readily administered by the patient or a physician, e.g., in an emergency setting. The dosage, duration & life span of nasiyam medicine is clearly explained in various siddha literatures. Single drug, compound drug, metal drug preparations are used in this treatment. Nasiyam treatment is based upon basic concept of siddha medicine, which means Mukkutram and time of the day (siru pozhuthugal). Given these positive attributes, it is logical to consider nasiyam administration when developing new therapeutics, or when extending the life or improving the profile of an existing drug. In order to assess the desirability and viability of such an approach, a series of questions regarding the drug and its use should be addressed

5.Conclusion

Only minimal numbers of siddha physicians practise the nasiyam treatment. Siddha physicians should follow the pathway of Siddhar's and increase the usage of nasiyam in therapeutically and there by the health of human being should be protected. Today

siddha system of medicine needs global acceptance and it would be only possible by introducing siddha external therapies as main stream. Siddha external therapies need lot of researchers under the integration of medicine and non-medical scientists in one roof towards global acceptance. Careful selection of a specific therapy, for a specific patient, for specific ailments is essential to get success goal.

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