

PRATISHYAYA SAMPRAPTI – A NEW OUTLOOK

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ABSTRACT

Life encompasses the states of health and disease. Ayurveda, the spearhead science deals with these states of life. Various fervent concepts with sturdy bedrocks were laid down for discerning the body. Diagnosis and understanding of a disease is of prime relevance in the field of medicine. In the current era of industrialization and urbanization, one of the major social set back is to meet a clean and hygienic domain. Lack of hygiene can steer way to the origin of contagious diseases. One such type of conditions includes the rhinitis. It is one of the frequently tormenting conditions manifesting in different stages of life. The symptoms of rhinitis resembles with that of the condition of *pratishyaya* mentioned in the Ayurvedic medical literature. The work highlights about the etiological factors that are mentioned in the classics with special reference to the pathogenesis. The article covers both Ayurvedic and contemporary knowledge regarding the pathogenesis and manifestation of disease.

Keywords: Rhinitis, *Pratishyaya*, Etiology, Pathogenesis, Ayurveda

INTRODUCTION

Pratishyaya is characterized by symptoms like *nasasrava* (running nose), *ghranauparodha* (nasal obstruction or congestion), *shirashoolam* (headache), *shirogauravam* (heaviness of head), *jwara* (fever), *kasa* (cough), *kaphotklesha* (phlegm), *swarabheda* (hoarseness of voice), *aruchi* (anorexia), *klama* (tiredness) and *indriyanamasamarthyam* (affected senses)¹. These all indicates inflammation of the nasal mucosa to an extent. Rhinitis is one of the common examples for contagious disease seen all over the world irrespective of gender, race, region and climate². Once this condition of rhinitis or *pratishyaya* is being left untreated, it is potential enough to pave way for conditions like *kasa*(cough), *swasa*(dyspnea), *gandhaanjnana* (anosmia), *badhirya* (deafness) and even the advanced form of disease such as the *rajayakshma*

(severe form of disease with multisystem involvement)³. The disease *pratishyaya* is elaborately described in the ancient Ayurvedic treatises like *Charaka samhita*⁴, *Susrutha samhita*⁵ and *Ashtangahrudaya*⁶. Rhinitis is caused due to exogenous and endogenous factor. They can be infectious or non - infectious in nature⁷. Infectious agents can be those derived from external environment or those that are present in the nasal cavity; to be specific in the nasal microbial flora. Microbial flora refers to the microbes pertaining to the specific locations like the oral cavity, nasal cavity, ear and that which may be discernible with the aid of microscope⁸. Hence, microbial floras are specific ecosystem where the microorganisms are present. The disease may be a result of human micro biome interactions. The same change from one to other and it is wrong to think that all

people have similar interaction with microorganisms. It is important to keep in mind the full spectrum of human variable. The sources of variation in host susceptible to microbes includes variation in nutritional status, variation in levels of stress, hormones, variation in genes that confer resistance to microbes, variation in somatic cell nutrition involved in immune system function, physical damage to the tissues can open tissue barrier and lead to infection, finally behavioral differences, promote health and avoid pathogens. Other behaviors also may be potential enough to damage defenses and bring people into contact with pathogenic microbes.

Basic anatomy and physiology of nose and paranasal sinuses:

Nose is one of the most delicate organs of the human body. It plays a pivotal role in serving right from cosmetic function to vital physiology of respiration and olfaction⁹. Nose is also responsible for filtering, warming and moistening of inhaled air and also helps in resonance. Nose consists of two parts – vestibular part and nasal cavity¹⁰. The vestibular part is lined by the epithelium and carries hair follicles which present the entry of gross foreign bodies or entities to the nasal cavity¹¹. Whereas, particles with least size like the pollen, dust, etc. are tracked down by the mucous membrane present in the nasal cavity.

Briefing the nasal septum or medial wall¹² of the nasal cavity are supplied richly with vasculature. It carries five vessels, they include the anterior ethmoidal, posterior ethmoidal, sphenopalatine artery, greater palatine artery and labial artery. They all form together a plexus called Hasselbac's plexus or Kiesselbac's plexus, which is the prime area reflecting epixstasis¹³. The major vessel contributing to the plexus is sphenopalatine artery, so it is also termed as "epixstasis artery". There are three sets of nerves innervating – as anterior ethmoidal nerve, posterior ethmoidal nerve and a small nasal branch of infra orbital nerve. Skeletal frame work of the nasal

septum or medial wall of nasal cavity constitute perpendicular part of the ethmoid bone, vomerine bone, palatine bone, maxilla, septal cartilage, alar cartilage, vomerine cartilage. The cartilage favors the flexibility of nose during any contact events.

Lateral wall of nasal cavity is more complex with structures compared to the septum. Here, there are three scrolls like projections from the lateral wall of the nose called as the conchae which consists three of them i.e. superior, middle and inferior conchae. They are covered with mucous membrane and are called as the turbinates (i.e. superior, middle and inferior turbinates)^{14, 15, 16}. Inferior and lateral to each of the conchae there are three meatus i.e. superior meatus – inferior and lateral to superior conchae, middle meatus – inferior and lateral to inferior conchae. Superior to superior meatus we have sphenoidal to which the nasal cavity is lined by olfactory epithelium¹⁷. The air inhaled gets bound to the receptors of the olfactory epithelium which in turn signals the olfactory bulb.

Sinuses and Drainage:

There are four sinuses, which include frontal sinus, ethmoidal sinus, sphenoid sinus and maxillary sinus which are all continuous with the nasal cavity through openings or ostia which are obscured by the conchae from visibility¹⁸. The frontal sinus opens into a funnel shaped tunnel ending in an infundibulum superior to the hiatus semilunar (which is a membrane curved depression present in the middle meatus). The ethmoidal sinus opens at three different sites i.e. the anterior to the hiatus semilunaris, the posterior cells drains to one or more openings in the sphenoidal recess¹⁹. The maxillary sinus drains to the inferior part of hiatus semilunaris in the middle meatus. The ostia at the inferior meatus are for the draining of naso lacrimal duct. Lateral wall is innervated by ethmoidal nerve, maxillary nerve, greater and

lesser palatine nerve and infra orbital nerve.

Skeletal built of the lateral wall, it is a confluence of bones including the ethmoidal-bone forming both superior and middle

conchae, the perpendicular plate of palatine and maxilla, the inferior conchae itself is a separate bone, the lateral nasal bone, upper and lower lateral cartilage and the alar cartilage.

Vulnerable components:

- 1) Mucosal membrane/ blanket
- 2) Vessel supplying
- 3) Nerves innervating
- 4) Bones and cartilages
- 5) The ostia or openings or infundibulum of sinuses or the meatus
- 6) Sinuses itself

The components may be affected structurally or functionally brought about by the various predisposing factors or etiology or *nidan* leading to any anomalies or disorders.

Pratishyaya:

Literally discerning the term *pratishyaya*, denotes anything which is flowing out of nostrils or that which flows out frequently or continuously. The substance can be mere colorless fluid or water to mucous to pus or blood minced mucous and thick blood to cerebrospinal fluid. Hence, the discussion of *pratishyaya* in classics doesn't restrict to the condition called rhinitis but it can be better comprehended as simple rhinorrhea to multisystem involved conditions. Numerous causative factors or etiology or predisposing factors can trigger the condition of *pratishyaya* with *chayadi-prakopa* (where the disease onset will be gradual in which the stage of *chaya* or accumulation occurs gradually) or it will be *achayaprakopa* (where the disease is of sudden onset, in which the phase of *chayaavastha* is too short to be elicited). Therefore, the condition is of multifactorial origin. The three pioneers in Ayurveda mentions the major factors contributing to the condition of *pratishyaya*. They include – *vegasandharana* (with holding urges), *ajeerna* (indigestion), *raja* (dust), *atibhashya* (excess conversation), *krodha* (anger), *rtuvaishamy* (seasonal variation), *shiroabhitapa* (exposure to sun/ trauma), *prajagara* (night waking), *atisvapna* (excess sleeping), *ambusheeta* (cold water), *maithuna* (coitus), *avashyaya* (fog/mist), *dhooma*(smoke), etc^{20, 21, 22, 23, 24, 25}.

These etiologies lead to the premonitory

symptoms such as *shirogaurva* (heaviness of head), *kshavathu* (sneezing), *angamarda* (body ache), *lomaharsha* (horripilations), *jvara* (fever) and *kasa* (cough)²⁶. When the body is in contact with the causative factors, it leads to manifestation of symptoms such as *shirashula* (head ache), *aruchi* (anorexia), *yakshma* (wasting), *shirogaurava* (heaviness of head), *jwara* (fever), *indriyaasamarthyata* (impaired olfaction), *kasa* (cough), *kaphotklesha* (increased phlegm), *klama* (tiredness), *swarabheda* (hoarseness of voice)^{27, 28, 29}.

Pratishyayasamprapti:

According to *Acharya* Charaka, the disease occurs by the consumption of above said etiological factors leading to aggravation of *vata* in the head. But, *Acharya* Susrutha opines the disease manifestation because of vitiation of *vata* and other *dosas* individually or collectively associated with or without *raktha* accumulating in the head, producing *pratishyaya*. Whereas, the vitiation of *vata* in the nasal cavity leads to *pratishyaya* as mentioned by *Acharya* Vagbhata is not much in difference with the opinion of *Acharya* Kashyapa pointing *vata* aggravates and vitiates

the seat of *kaphainturn* causing *pratishyaya*^{30, 31, 32}.

Triad mechanism instigating *pratishyaya*:

The three mechanisms through which an etiology orchestrate the disease *pratishyaya* are Stress, Declined or Altered Immunity and Altered Ciliary Kinetics



Fig:1 Triad Mechanism for the etiologies to manifest *Pratishyaya*

(Fig: 1). Etiologies are mentioned in detail along with the probable pathogenesis culminating in *pratishyaya*.

Stress:

A physical, chemical or emotional factor that causes bodily or mental tension and may be factor in disease causation is termed as stress or a state resulting from a stress is one of bodily or mental tension resulting from factors that tend to alter an existent equilibrium³³. Certain etiological factors can be included in exposing body to stress. They include *vegasandharana*(suppression of natural urges), *krodha*(anger), *atibhashya*(excessive talk), *prajagara* (skipping sleep and waking during night), *rtuvaishmya* (seasonal variations), *shiroabhitapa* (exposing to heat or trauma of head), *maithuna* (coitus) and *dhooma* (smoke). All these factors are capable of activating autonomic nervous system i.e. parasympathetic nervous system leading to dilation of vessels resulting in engorgement of nasal vessels³⁴. The erectile tissues will be expanded. It results in nasal congestion or blockage, proportionate increase of hydrostatic pressure, ending in running nose. The entire phenomenon arises due to *dushti to prana and udanavayu*.

Altered or declined ciliary kinetics:

The mechanism by which mucus is propelled to the throat involves the rhythmic beating of very small cellular projections, known as cilia (which look like hair), which line the airways. In order for the mucus produced in the sinuses to reach the throat, the cilia throughout the sinonasal cavity are “programmed” to beat in a very specific direction. Each sinus has an ostium (opening) that the cilia carry the mucus towards and through into defined anatomical areas within the sinonasal cavity. The middle meatus is located lateral to the middle turbinate and accepts drainage from the frontal, maxillary, and the anterior ethmoid sinuses. Posteriorly, the superior meatus is below the superior turbinate, which accepts drainage from the posterior ethmoid sinuses. The drainage continues medially into the sphenoidal recess, which also accepts drainage from the sphenoid sinus and ends up in the nasopharynx or the upper part of the throat and subsequently swallowed.

Cilia continuously beat to drive the debris-laden mucus from the airways. Ciliated cells have multiple sensors that allow the cell to respond to locally produced mediators and/or certain cues, such as changes in mucus thickness and mucus loads to make their cilia increase the speed at which they beat. By increasing the speed at which they beat, the cilia can generate more force and thus continue to clear the heavier mucus, or clear normal mucus at a faster rate. Conversely, when mucociliary clearance is inhibited or slowed there may be an increased incidence of rhino sinusitis, as seen in patients with cystic fibrosis while the ciliated cells respond to environmental cues, environmental insults can also affect cilia function in a detrimental manner. Many microbes that attack the airways produce toxins that rapidly alter cilia movement. Paralyzing the cilia stops the

movement of mucus and optimizes the conditions for infection. Infection perpetuates a local inflammatory response and it is becoming clear that even the inflammatory molecules our bodies produce to fight infection also have detrimental effects on cilia function thereby worsening the insult and further hindering mucus clearance. The combination of microbes and inflammation over a relatively short period can lead to loss of cilia³⁵.

The etiological factors that can probably affect the ciliary kinetics include *vegasandharana*, *krodha*, *atibhashya*, *prajagara*, *rtuvaishamyā*, etc. In this instance the *vataprakopa* can bring about affect in the *gati* of *vayuinturn* causing *pratilomagati* resulting in the running nose or with the influence of *kapha* there is reduced motility of cilia resulting in stagnation of mucus or due to increase in *pitta* results inflammatory mediators to inhibit the movement of cilia.

Declined or altered immunity:

Immunity is the body's ability to fight off harmful micro-organisms – pathogens that invade it³⁶. The immune system produces antibodies or cells that can deactivate pathogens. When the components of immune system are affected such as its cells, tissues, organs or organ system the immune system get tilted either with a reduced activity termed as immune deficiency state or an abnormally increased activity state ending in hypersensitivity disorders or autoimmune disorders³⁷. The following etiological factors mentioned in classics have the potential to cause decline or alteration in immunity; they are *sandharana*, *ajeerna*, *raja*, etc.

Understanding etiologies and possible pathogenesis in brief:

Sandharana: *Sandharana* refers to the (*vegasandharana*) suppression of natural urges like micturition, defecation, vomiting, etc. *Sandharana* of flatus or feces or micturition affects the *apanavayu*, inturn affecting other types of *vayu* like the *sa-*

manavayu causing *agnimandya* resulting in *rasa dushti*, followed by reduced *vyadhikshamatva*, open to invasion (opportunistic infection) and upper respiratory tract is most prone part, resulting in *pratishyaya*. *Apanavayu* also produces *dushtito* the *pranavayuinturn* causing *pratilomagati* of *vayu* and affecting the physiology of *pranavayu*, which can be understood as the altered ciliary kinetics resulting in flow of mucus in opposite direction rather towards the pharynx. The stress produced by the holding of urge can activate autonomic nervous system as explained before and end in running nose. *Ajeerna*: *Ajeerna* can be comprehended as an impaired digestion. Defect in the process of digestion results in production of *anna rasa* of poor quality or *rasa dushti*. *Rasa* is the platform for *kaphadosha*. *Kaphadosha* in its *prakrutavastha* is acknowledged as *bala* or *vyadhikshamatva*. Therefore, *rasa dushti* invariably end in a declined *vyadhikshamatva* (declined immunity) due to *mandagni*. From contemporary point, due to a condition called Gastro Esophageal Reflux Disorder (GERD)³⁸, the incompetency of lower esophageal sphincters leads to acid reflux to the esophagus from stomach. These results in the release of inflammatory mediators, which inturn are flushed into the blood circulation. The blood containing inflammatory mediators cause dilation of nasal vessels or results in the engorgement of vessels leading to nasal congestion associated with inflammation and running nose.

Raja: *Raja* refers to the particles in the atmosphere that come from various sources such as soil, dust lifted by weather, volcanic eruptions, and pollution. It can act as an immediate cause (*achayaprakopa*) or a delayed etiology (*chayapurvakaprakopa*) for the manifestation of *pratishyaya*. Immediate reaction is due to the hypersensitivity reaction (Type 1 hypersensitivity reaction) resulting from direct activation of B – cells producing antibodies resulting in the destruction of basophils releasing chemical mediators that are responsible for bringing the immediate tissue changes

(immunologic tissue injury). Allergic rhinitis³⁹ and vasomotor rhinitis⁴⁰ can be comprehended in this context. In *chayapurvakaprakopa*, there is a chronic exposure of nasal cavity to dust resulting in conditions like rhinitis sicca. *Atibhashya*: *Atibhashya* refers to the excessive talk or speech. It leads to *rasa dhatukshaya*. The result is decline in *vyadhikshamatva* opening body to opportunistic infection. Also, stress induced plays a part in the manifestation of symptoms too through autonomic nervous system activation.

Rtuvaishamyā: Seasonal variations can bring about changes in various systems in the human body like the nervous system, cardiovascular system or even triggers the immune system of the human body. Seasonal variation leads to physical as well as mental stress. This activates multiple systems producing various symptoms including running nose. Hence, seasonal variations also produce running nose. *Shiroabhitapa*: Exposure of body (head) to heat results in vaso dilation or by inducing stress resulting in symptoms like running nose. Trauma of head in severe cases may provoke nasal bleeding or CSF rhinorrhea. *Atisvapna*: *Atisvapna* refers to excessive sleep. Excessive sleep increases *kaphadosha*. This may result in reduced ciliary kinetics. Poor clearance of mucous results in stagnation and running nose. Excess *kaphadosha* also can produce *agnimandya* leading to reduced *vyadhikshamatva*. *Maithuna*: During the act of intercourse, there will be activation of parasympathetic nervous system, leading to running nose. The condition is also known in contemporary science as honeymoon rhinitis⁴¹.

Neechaatiucchaupadhana: Abnormally low or high elevation of head can induce running nose. Because change in posture lead to change in resistance (nasal resistance). That is due to alterations in jugular venous pressure resulting in nasal congestion and poor activity of cilia and an increase goblet cell activity resulting in running nose. *Avashyaya*: *Avashyaya* refers to

the mist or fog. Fog is defined as obscurity in the surface layers of the atmosphere, which is caused by a suspension of water droplets. But, mist is defined as obscurity in a higher level of atmosphere with less density. Hence, mist is predominant of *vata* whereas fog as *kapha* predominant. Both are having potential to cause *pratishyaya*. The mechanism is through the parasympathetic nervous system activation. *Peetanaanyenavarina*: Consumption of contaminated water or *dushtajala* results in *vata* and *pitta doshaprakopa*. The ultimate result may be an infectious rhinitis. Consumption of alcoholic beverages induces activation of autonomic nervous system inducing vasomotor rhinitis.

The multifactorial understanding of the condition is not limited and pathogenesis will be multiple and overlapping making it a hurdle to plot the exact mechanisms involved. But, these are few of the understandings yielded from ancient and contemporary medical literature. The permutation and combinations for etiological factors are innumerable and so is the pathogenesis.

CONCLUSION

The disease *pratishyaya* has been mainly discussed on *Pratishyayapratishedhaadhyaya* of *Susruthasamhita*, *Rajyakshmachikitsa* of *Charakasamhita* and *Nasarogavijnaniyam* of *Ashtangahrudaya* respectively. Several etiological factors are been discussed with regard to the causation of disease. Each of the etiology takes different pathways to reach a fully blown condition. It is mentioned in the classics, one etiology can lead to many diseases, many etiologies can lead to one disease and one etiology can lead to one disease. Many etiologies can lead to many diseases. *Pratishyaya* is a condition which is caused due to many etiological factors. Hence, it is difficult to plot an exact pathway for manifestation of diseases as they may be due to multitude of factors in varying proportions and so is the pathogenesis. The above mentioned ideology is to give a novel ap-

proach to the understanding of *pratishyayasamprapti*.

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