

HYPOTHETICAL EVALUATION OF ROLE OF NASYA IN MULTIPLE SCLEROSIS (AN AUTOIMMUNE DISEASE) - BOTH AS A PREVENTIVE MEASURE AS WELL AS TREATMENT

¹Deshpande Gayatri Sameer, ²Gotipamul Smita Rajanna, ³Deshpande Sameer
Ramchandra

^{1,2}Assistant professor, Department of Sharir Rachana, S.G.R. Ayurved College, Solapur, Maharashtra, ³Assistant professor, Department of Agad tantra evam vyavahar ayurved, Shri O.H. Nazar Ayurved College, Surat, Gujrat. Mobile- 9421867652

ABSTRACT

Multiple sclerosis is a chronic disorder principally affecting young adults characterized by presence of numerous areas of demyelination in central nervous system. Exact cause is unknown but it is mentioned under autoimmune disease and genetic susceptibility is there. It is demyelinating disease in which the insulating covers of nerve cells in the brain and spinal cord are damaged. Signs and symptoms depend upon location of lesion but specific first symptoms may include double vision, blindness in one eye, muscle weakness, trouble with sensation and coordination. As per Ayurved it is Shiro Roga with predominance of vata dosha. In multiple sclerosis after stripping out myelin, scars are present in form of plaques. It is sang / avaran samprapti. Disruption of messages among nerve fiber is vimarg gaman so here treatment which will remove Sang/ avaran and reverse vimarg gaman will be beneficial. Also treatment which will stop further destruction and stimulates repair is necessary. In Ayurved nasya is treatment for or shiro roga. It is also mentioned as a preventive measure for Shiro roga if followed as a daily regimen. So here how nasya will act on central nervous system as per modern medicine as well as Ayurved is discussed. Also how nasya will be beneficial in multiple sclerosis if followed regularly with process mentioned as well as its role in treatment to prevent further relapse and drugs to stimulate repair of destruction is discussed here. As it is hypothetical statement for the actual case study is needed.

KEY WORDS- autoimmune disease, multiple sclerosis, nasya, preventive measure, treatment

INTRODUCTION

Auto immune diseases

Auto immune diseases arise when immune responses either antibodies or T cells directed against self- antigens, cause tissue damage. The etiology of these diseases is multifactorial involving both environmental and genetic influences¹. Multiple sclerosis is one of the auto immune diseases.

Multiple sclerosis

Multiple sclerosis is a chronic disease principally affecting young adults characterized by presence of numerous areas of demyelination in the central nervous system. It has tendency towards remission and exacerbation². Exact cause is unknown. An attack of central nervous system inflammation in multiple sclerosis starts with the entry through the blood brain barrier of activated T lymphocytes. Much of initial acute clinical deficit is caused by the effect of inflammatory cytokines upon transmission of the nervous impulse rather than structural description of the myelin which explains the rapid recovery of some

deficits and probably the efficacy of Steroids in ameliorating deficit³. However the myelin loss which results from an attack reduces the safety factor for impulse propagation or causes complete conduction block which lowers the efficiency of central nervous system functions⁴. Demyelinating lesions cause symptoms and Signs which usually come on Sub acutely over days weeks or months. The first symptoms may include a feeling of heaviness or weakness in the muscles, abnormal sensations, or double vision⁵. The physical signs observed in multiple sclerosis depend on Anatomical site of demyelination. Management of multiple sclerosis includes treatment of acute relapse and prevention of further relapse. In acute relapse high dose of intravenous steroids are used while in relapsing and remitting multiple sclerosis subcutaneous or intramuscular steroids are used⁶.

Myelin

The axons of mammalian neurons are surrounded by a multi-layered lipid and protein covering called the myelin sheath

that is produced by neuroglia. The sheath insulates the axon of a neuron and increases the speed of nerve impulse conduction. Schwann cells in PNS and oligodendrocytes in CNS produce myelin sheath. Myelin protects the nerve fibers in CNS which helps messages travel quickly and smoothly between the brain and rest of body. In multiple sclerosis immune system mistake myelin for a foreign body and attacks it. It damages myelin and strips it off the nerve fibers complete or partial leaving scars known as lesions or plaques. This damage disrupts messages travelling along nerve fibers. They can slow down, become distorted or not get through at all. Sometimes damage to actual nerve causes increase in disability that can occur over time.⁷

Multiple sclerosis and Ayurved

Multiple sclerosis is not mentioned in Ayurved. It is Shiro roga according to Ayurved. As per symptoms vata dosha is predominant. Double vision, blindness in one eye, muscle weakness, trouble in coordination are main symptoms.⁸ These are related to shira sthana and vata dosha. Among four major symptoms of srotas

doshti sang is major pathology in multiple sclerosis. Exaggerated dosha with predominance of vata dosha do sthana sanshraya at sheer. Kapha dosha is responsible for maintenance of indriya.⁹ Due to vata dosha prakopa degeneration takes place. As per Ayurved for indriya artha sanyoga, function of muscle, coordination and movement vata is responsible. So in multiple sclerosis as per symptoms vata vikruti especially degeneration is predominant. After stripping out nerve fibers scars are present in the form of plaques. It is sang or avaran samprapti. Disruption of messages along nerve fiber is vimarga gaman. So here upakrama which will remove sang /avaran and reverse vimarga gaman will be e beneficial. Also treatment which will stop further degeneration and repair the damage will be beneficial.

DISCUSSION

1) Action of nasya on CNS as per modern medicine

Due to blood brain barrier and blood CSF barrier central nervous system diseases have great challenge for or entry of medicine into to brain tissue. BBB protects brain cells from harmful substances and

pathogens by preventing passage of many substances from blood to brain tissue.¹⁰ Blood CSF barrier is present at Choroid plexus. It permits certain substances to enter CSF but exclude others. Both of these barriers are lipoidal and limit the entry of non-lipid soluble drugs. Only lipid soluble drugs therefore able to penetrate and have action on central nervous system.¹¹ Nasal route allows drugs which do not cross BBB to enter CNS and eliminates the need of systemic delivery and thereby reducing unwanted systemic side effects. Modern science accepts the concept of close relationship between nose and brain. So we will see that how drug will absorb and how it will act on C.N.S. according to modern also.

2) Drug transport through nasal route

a) Through nasal mucosa (Diffusion Method)

The nasal cavity is covered by a thin mucosa which is well vascularized. A drug molecule can therefore quickly be transferred across the single epithelial cell layer directly to the systemic blood circulation without first pass hepatic & intestinal metabolism¹². Drug absorption

through mucosal surface is generally efficient because stratum conium epidermis, the major barrier to the absorption across the skin is absent in nasal cavity. Lipid soluble drugs diffuse by dissolving in lipoidal matrix of membrane. A more lipid soluble drug attains higher concentration in the membrane & diffuses quickly¹³. Drops spread more extensively than spray¹⁴. Three drops cover most of walls of nasal cavity with patient in a supine position & head tilted back¹⁵. Small unchanged particles easily pass through this layer by following processes.

i) Paracellular transport – It is aqueous route of transport. It is slow, passive & only useful for drugs with

low molecular weight.

ii) Transcellular process – Transport through lipoidal route, only for lipophilic drugs.

iii) Drugs also cross cell membrane by an active transport route through the openings of tight junctions.

b) Vascular Pathway

The nasal tissue is highly vascularized making it an attractive site for rapid & efficient systemic absorption. Rich vascular plexus permits topically

administered drugs to rapidly achieve effective blood levels while avoiding intravenous catheters¹⁶. If blood flow to the nasal mucosa is poor, absorption of drug will be poor¹⁷. Lipid soluble drugs pass readily across the whole surface of capillary endothelium. Capillaries having large paracellular spaces do not obstruct absorption of even large lipid soluble molecules or ions¹⁸. Application of heat & muscular exercise accelerates drug absorption by increasing blood flow.¹⁹ Vascular path transportation is possible through the pooling of nasal venous blood into the facial vein. It occurs naturally. The facial vein has no valves. It communicates freely with the intracranial circulation. It communicates through pterygoid plexus with the cavernous venous sinus²⁰. Such 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 & related intracranial organ.

c) Neurological Pathway

If drug administered through nose contacts the olfactory mucosa, there are good evidences that suggest molecule

transport can occur directly across this tissue & into CSF. Olfactory mucosa is located in the upper nasal cavity, just below the cribriform plate of the skull. It contains olfactory cells which transverse the cribriform plate & extend up into the cranial cavity²¹. When medication molecules come in contact with specialized mucosa, they are rapidly transported directly into the brain, skipping BBB & achieving very rapid CSF levels. Major divisions of olfactory tract leads directly to a portion of the amygdale called corticomedial nuclei that lie immediately beneath the cortex in the pyriform area of the temporal lobe.²² The olfactory nerves differ 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 etc²³. So the drugs administered here stimulate the higher centers of brain which shows action on regulation of endocrine and nervous system functions.

There are three mechanisms underlying the direct nose to brain drug delivery – one is intracellular transport

mediated route & two extracellular transport mediated routes. Intracellular transport mediated route is a relatively slow process, taking hours for intra-nasally administered substances to reach the olfactory bulb.

In first extracellular transport mediated route, drug could first cross the gap between the olfactory neurons in the olfactory epithelium which are subsequently transported into olfactory bulb. In second route, drug may be transported along the trigeminal nerve to bypass BBB. After reaching the olfactory bulb of trigeminal region, the drug may enter into other regions of brain by diffusion.

3) Action of nasya as per Ayurved

Drug administered through nasal route is called as nasya²⁴. Though ayurved is very ancient science, at that time also routes for drug administration other than oral were in practice. Nasal route, parental route, topical (skin, cornea) etc. were well practiced for drug administration. Nasya is specifically designed route for *shirorogas*²⁵.

In Charak Samhita nasya is mentioned as best treatment for shirorogas because drug introduced through it enters Uttamang and removes morbid dosha

responsible for diseases²⁶. For explaining how nasya removes dosha, example of Munja and Ishika is given in commentary of Chakrapani. According to Chakrapani, drug administered as a nasya enters into head and draws out exclusively morbid dosha as Ishika is taken out after removing of fibrous coating of Munja adhered to it²⁷. Acharya Gangadhar gives different opinion in his commentary he states that nasya medicine enters into shira and removes dosha which are adherent to Majja peshi (brain tissue)²⁸.

4) Effect of nasya in multiple sclerosis

A) Effect of nasya as a preventive major for multiple sclerosis

As in multiple sclerosis samprapti occurs in shira, it is necessary to keep shira healthy as a preventive measure. Ayurved states that only dosha prakopa do not cause any disease. Dosha dushya samurcchana is necessary for it. It takes place only at kha-vaigunya. So if there is no kha-vaigunya in shira, disease will not take place. so for prevention it is necessary to keep shira healthy and free from exaggerated dosha. For this many upakrama are mentioned in dinacharya such as nasya, gandush, dhumpana.

Nasya is described as gateway for head. Medicine introduced through it occupies Shrungatak marma and all channels of eye, ear and throat and removes morbid dosha. Nasya is mentioned as a daily regimen in dinacharya. Its action is on Shira as well as indriya. Navan nasya or Tarpan nasya are especially preferred for maintenance of indriya. Nasya of Tila taila on a daily basis will serve as a preventive measure for multiple sclerosis. It will remove morbid dosha, will prevent the dhatu kshaya and hence pacify vata prakopa. So it will be beneficial. Lipid form of medicine facilitates drug absorption-

Maximum kalpas used for *nasya* are prepared in lipid base. This facilitates the absorption of medicine through mucous membrane and capillaries. According to pharmaceutical research, lipid soluble drugs diffuse by dissolving in lipid matrix of membrane. A more lipid soluble drug attains higher concentration in the membrane and diffuses quickly. Lipid soluble drugs pass readily across the whole surface of the capillary endothelium.

B) Nasya as a treatment of multiple sclerosis –

There is no cure for multiple sclerosis in modern science. Management involves treatment of acute relapse and prevention of future relapse. Steroids are mostly used. In multiple sclerosis demyelination is major cause and mammalian neurons have very limited powers of regeneration. So, treatment is based upon prevention of further destruction. As per Ayurved, central nervous system is mainly composed of one of the dhatu- majja. Due to many dietary, psychological, environmental factors, dhatu kshaya takes place (cha. Su.17/76-77).²⁹ As samprapti takes place in shira, nasya upakrama is best choice of treatment.

4) Drugs preferred for nasya-

In Charak Samhita, Sneha processed with madhur skandha is mentioned for Tarpan nasya³⁰ while in Ashtang Hridayam sneha processed with bruhan dravya is mentioned³¹. In Charak Samhita 8th chapter of viman sthana madhura skandha is mentioned. As we know best karma of Shukra Dhatu is regeneration. It is not limited only up to Garbha. Shukradhaara Kala lies all over the body and do regeneration at cellular level also. Ultimately it is beneficial for repair of

destructive structure. Madhura rasa is Dhatu vardhak. Among dravya of Madhura skandha- Shatavari³² Atmagupta³³ Ashvagandha³⁴, Vidari³⁵ and Yashtimadhu³⁶ dravya are Shukra Vardhak and hence helps in function of regeneration. So Sneha processed with one or all of these dravya will help to strengthen the central nervous system and prevent relapses of multiple sclerosis. It may also prove helpful as a stimulating factor for genesis of stripped off myelin sheath in central nervous system.

CONCLUSION

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In multiple sclerosis main cause is demyelination of CNS. Main place of pathology is head. Most symptoms are related to indriya which are located in head and it is functional area of nasya. Nasya acts on all shiro rogas and also gives strength to the constituents in the head for their normal functioning. So nasya of tila taila on daily basis will help as a preventive measure for multiple sclerosis. Also oil processed with madhur shukra vardhak dravya will help in prevention of relapse as well as stimulating factor for regeneration.

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