



Myasthenia Gravis: An Ayurvedic Review

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ABSTRACT: Myasthenia gravis (MG) is an autoimmune disorder of neuromuscular junctions. It is characterized by fluctuating weakness as well as fatigability of voluntary muscles. The disease results from immune-mediated impairment of neuromuscular transmission, most commonly due to antibodies directed against components of the postsynaptic membrane. This review article presents an overview of the epidemiology, pathophysiology, clinical features, diagnosis, and management of Myasthenia Gravis, with a balanced integration of contemporary understanding and Ayurvedic concepts. An effort has been made to summarize Ayurvedic concepts and management in case of Myasthenia Gravis with a thought that an integrative understanding that combines modern medical science with traditional Ayurvedic principles may offer a holistic perspective for patient care.

KEYWORDS: Myasthenia Gravis, Autoimmune disorder, Neuromuscular junction, Ayurvedic management, Integrative medicine, Holistic approach

INTRODUCTION

Myasthenia gravis (MG) is the most common disorder affecting the neuromuscular junctions (NMJ) of the skeletal muscles. The classic presentation is a fluctuating muscle weakness that is more prominent in the afternoon. It usually involves muscles of the eyes, throat, and extremities. The reduced transmission of electrical impulses across the neuromuscular junctions due to the formation of autoantibodies against the specific postsynaptic membrane proteins consequently causes muscle weakness.^[1] Due to its variable presentation and chronic course, it significantly affects quality of life.

EPIDEMIOLOGY

Myasthenia Gravis demonstrates a bimodal age distribution rather than affecting fixed age groups exclusively. Early-onset Myasthenia Gravis typically occurs between 20 and 40 years of age and shows a clear female predominance. Late-onset Myasthenia Gravis generally presents after 50 years of age, extending into the seventh and eighth decades, with male predominance or near-equal gender distribution in older populations. Overall prevalence suggests a slight female predominance in younger age groups, with a shift towards higher prevalence among elderly males. This bimodal pattern should be recognized to ensure epidemiological

accuracy and alignment with current global data.^[2] Ocular Myasthenia Gravis tends to present at later age, more frequent in males. Thymomatous Myasthenia Gravis is more common above 50 years of age with equal gender distribution.

Aim and Objective:

1. To study the conceptual resemblance of Myasthenia Gravis with *Vatavyadhi* & *Oja kshaya* in *Ayurveda*.
2. To review the *Ayurvedic* treatment principles in the management of Myasthenia Gravis.

MATERIAL AND METHODS

Various Ayurvedic and Modern texts, journals were studied to gather information regarding Myasthenia Gravis, *Vatavyadhi* and *Oja kshaya* etc to draw a possible pathogenesis and management.

Literature Review:

• Modern Review (Etiopathogenesis) ^[3]

Under normal physiological conditions, motor neurons release the neurotransmitter acetylcholine (ACh) at the neuromuscular junction. Acetylcholine binds to nicotinic ACh receptors located on the postsynaptic muscle cell membrane, triggering a cascade of events that leads to depolarization of the muscle end plate and subsequent muscle contraction. In Myasthenia Gravis, this process is disrupted by an autoimmune mechanism classified as a type II (antibody-mediated) hypersensitivity reaction. In affected individuals, B lymphocytes produce pathogenic autoantibodies directed against components of the postsynaptic membrane, most commonly the acetylcholine receptor. Binding of these antibodies to ACh receptors prevent acetylcholine from attaching to its receptors, thereby impairing neuromuscular transmission and reducing the muscle's ability to respond to neural stimulation. In addition to functional blockage, anti-acetylcholine receptor antibodies activate the classical complement pathway, leading to inflammation and structural damage of the postsynaptic membrane. This immune-mediated injury results in destruction of the neuromuscular junction folds and a reduction in the number of functional acetylcholine receptors available on the muscle cell surface, further exacerbating muscle weakness.

A minority of patients with Myasthenia Gravis produce antibodies against muscle-specific receptor tyrosine kinase (MuSK). These antibodies do not directly target acetylcholine receptors but instead interfere with proteins essential for the maintenance and clustering of ACh receptors at the neuromuscular junction. Despite differing targets, MuSK antibodies similarly lead to impaired neuromuscular transmission and muscle weakness.

The thymus gland plays a central role in disease pathogenesis by contributing to immune dysregulation and autoantibody production. Thymic hyperplasia is commonly observed, and in rare cases Myasthenia Gravis may be associated with thymic neoplasms (thymoma) or, less commonly, may occur as a paraneoplastic manifestation of malignancies such as bronchogenic carcinoma. These associations further support the immune-mediated nature of the disorder.

• Ayurvedic Review

From an *Ayurvedic* standpoint, Myasthenia Gravis can be correlated with *Vata-vyadhi*. Acharya Charak describes muscular fatigue and inability of muscular movements under the heading of *Vata Vyadhi*, considering the principle that *vata* is responsible for all the movements in the body including neuromuscular junctions. While describing the *prakrita karma* of *vata*, Acharya Charak states that it is responsible for all the activities in the body also including neuromuscular junctions (*Pravartaka cheshtanam uchchavachanam*) ^[4] *Vata* is further classified into 5 types: *Prana*, *Udana*, *Samana*, *Vyana* and *Apana*. Functions of *vyana vata* such as *Gati*, *Prasarana* (extension), *Aakshepa* (flexion), *Apkshepa*

(downward movements), *Utkshepa* (upward movements), *Unmesha- Nimesha* (opening and closing of eyelids) as per told by different *Acharyas*; indicate its importance in bodily activities ^{[5],[6],[7]}. *Acharya Sushruta* also explained the inability to do bodily functions while explaining *vataksaya* (*vataksaye mandacheshthata*) ^[8] which may simulate with features of Myasthenia Gravis.

This disease can also be correlated with *Oja kshaya* as per *Ayurveda* as far as the autoimmune concept is concerned. *Acharya Sushruta* defined *Ojas* as the *utkrishṭa sara* of all *Dhatus*, commencing from *Rasa* and culminating in *Shukra*. *Ojas* is also termed as *Bala*, ^[9] signifying the vital force responsible for strength, immunity, and overall physiological stability. *Bala* plays a crucial role in maintaining the stability and proper nourishment of the *Mamsa Dhatu* ^[10], thereby supporting muscular integrity and strength. *Oja Kshaya* occurs in progressive three stages: *Visransa*, *Vyapat* and *Kshaya* where features like *Gatra sadana*, *Kriya asannirodha*, *stabdha gatrata* and *mamsa kshaya* ^[11] develop in the body respectively indicating muscle fatiguability and weakness; simulating with the features of Myasthenia Gravis.

On the other hand, Ocular Myasthenia Gravis can be correlated with *Vatahata Vartma* as per *Ayurveda*. When *Vata* and other *Doṣhas*, either individually or in combination, become excessively aggravated, they disseminate into the *Siras* situated in the *Vartma* (eyelids). After lodging there, further aggravation of the *Doṣhas* result in an increase of local *Mamsa* (muscular tissue) and *Rakta* (blood), leading to the rapid manifestation of disease in the eyelid. ^[12] Its symptoms like “*Vartma yat tu Nimeelyate, vimuktasandhi, nishcheshtam heenam vatahatam*” are described by *Acharya Vagbhata* ^[13]. This symptom simulates with ptosis found in Ocular Myasthenia.

Acharya Charaka also has described few clinical features in *Indriya Sthana* under *Ariṣṭa Lakṣhaṇa* which can be correlated with neurological and neuromuscular disorders. Few of these symptoms closely resemble to those observed in Myasthenia Gravis. For instance, *Ati Mukta Bandhana* ^[14] denotes drooping of the upper eyelids, which may be attributed to weakness and fatigability of the eyelid muscles. Similarly, “*Na Upaiti Kantham aaharo Jihva kantham Upaiti cha*” ^[15] refers to difficulty in swallowing, corresponding to oropharyngeal dysphagia, along with associated features such as shallow breathing, alteration in voice and speech, muscle wasting, and a characteristic pattern of muscular weakness. These descriptions highlight that Ayurvedic classics have extensively documented clinical features analogous to various neurological and neuromuscular disorders, which show significant similarity to Myasthenia Gravis.

Samprapti:

As per *Ayurveda*, *Nidana sevan* leads to the *Agnidushti* and production of *Ama* in the body which causes faulty production of *Dhatus* (*Uttarottara Dhatu Kshaya*). *Dhatu kshaya* leads to *Oja kshaya lakshanas* in the body. *Oja kshaya* leads to further vitiation of *Vata doṣha*. Vitiated *vata* causes *vatavyadhi lakshanas* in the body, also when this *dushita vata* subsequently localizes in *Mamsa Dhatu*, it causes *Mamsagata vata dushti lakshana* ^[16].

Clinical Features (Modern View) ^[17]

The hallmark feature of Myasthenia Gravis is fluctuating muscle weakness that worsens with activity and improves with rest.

Bulbar Myasthenia Gravis: when it affects muscles controlled by brainstem (bulbar muscles), it causes following features-

- Dysarthria (fluctuating weakness in talking, nasal speech)
- Masticatory weakness
- Dysphagia (difficulty in swallowing)
- Dysphonia (hoarseness), Slurred speech
- Choking

Facial muscle weakness:

Difficulty in eyelid closure

Poor cheek puff, Drooling

Weakness in muscles of limbs (more in arms than in legs)

Weakness of Axial muscles

Weakness of respiratory muscles: Exertional dyspnea

Tachypnea

Respiratory failure

Ocular Myasthenia Gravis

Ocular myasthenia gravis is the presenting feature in 60% Myasthenia Gravis patients. It is characterized by weakness restricted to the extraocular muscles, levator palpebrae superioris, and orbicularis oculi. While some patients may remain purely ocular, others may develop generalized Myasthenia Gravis^[18]. Presenting features of Ocular Myasthenia Gravis are Ptosis, Diplopia and Nystagmus(rare).

Diagnosis^[19]

Diagnosis of Myasthenia Gravis is based on a combination of clinical features, serological tests for autoantibodies, electrophysiological studies, and imaging of the thymus.

Common diagnostic tools include:

- Acetylcholine receptor antibody testing, Tensilon test
- Repetitive nerve stimulation and single-fiber electromyography
- Edrophonium or ice-pack test (in selected cases)
- Chest imaging to evaluate thymic pathology

Clinical Features and Diagnosis (Ayurvedic Review):

As per Ayurveda; clinical features and diagnosis is simply based on features of *Vatavyadhi*, *Vatahata vartma* and *Mamsagata Vata* and *Arishta Lakshanas* as explained by *Acharyas*. This includes: difficulty in bodily activities and movements, *Gatra sadana*, *Kriya Asannirodha*, *Mamsa kshaya*, *Vartma Nimeelana* and difficulty in swallowing etc.

Management

Conventional Medical Management^[20]

The primary goals of treatment are symptomatic relief, prevention of disease progression, and improvement in quality of life. Acetylcholinesterase inhibitors (e.g., pyridostigmine) are recommended as first-line therapy. Corticosteroids and other immunosuppressive agents may be used when symptoms are inadequately controlled or to prevent generalization. Non-pharmacological measures, such as ptosis crutches and prism glasses, are useful in selected ocular cases. Thymectomy in any antibody positive patient under 45 years with symptoms not confined to extraocular muscles, unless the disease has been established for more than 7 years. These treatments are effective in controlling symptoms and reducing disease-related morbidity.

Ayurvedic and Supportive Management

Ayurvedic management in Myasthenia Gravis is primarily supportive and aims at pacifying aggravated *Vata dosha*, thereby improving neuromuscular nourishment, and enhancing overall quality of life by reducing *Oja kshaya*. Procedures described in *chikitsa* of *Vatavyadhi* such as *Snehana* (*Snehapana* & *Abhyanga*)^[21], *Swedana* (*Naadi*, *Prastar* and *Sankar sweda*)^[22], *Niruha basti* (*Deepana-Pachana dravya yukta*)^[23], *Nasya* and *Dhoompana*^[24] may play an important complementary role when used alongside standard medical treatment. *Acharya Charaka* has described various *Sneha* preparations which play a vital role in pacifying vitiated *Vata*. He has also described several medicated ghee and oil formulations for both internal and external use such as *Dashmooladi ghrta* (oral intake, *Abhyanga*, *Basti*), *Baladi ghrta* (*Nasya*), *Moolaka taila* (Oral

and *abhyanga*), *Bala taila*, *Nirgundi taila*, *Sahachara taila* etc. [25] These *Snehas* contribute to the alleviation & normalization of aggravated *Vata Dosha*. Use of *Rasayana* drugs (immunomodulators) orally can also play a vital role in overall wellness in this disease. In addition to this, localized ocular therapies such as *Tarpana* and *Bidalaka* may help in strengthening ocular muscles and reducing fatigue particularly in case of Ocular Myasthenia Gravis.

DISCUSSION

Myasthenia Gravis is a neuromuscular disorder characterized by fatigable muscle weakness. Although in *Ayurveda*, the exact correlation with Myasthenia gravis is not known yet it can be correlated with *Vata vyadhi* as well as *Oja kshaya*. Ayurvedic procedures as described in treatment of *Vatavyadhi*; may offer supportive benefits when applied judiciously and in coordination with conventional management. Features of *Oja kshaya* [26] also simulate with features of Myasthenia Gravis; so by working on removal of toxins from the body and improved metabolism by use of *Rasayana*, *Oja kshaya* can be prevented. Following therapies in *Ayurveda* primarily act by pacifying aggravated *vata*, improving neuromuscular nourishment and enhancing functional coordination:

- **Abhyanga (medicated oil massage):** It helps in pacifying *Vata dosha* (*prashantamarutaabadham*) [27] which is mainly responsible in the pathogenesis of disease. Regular *Abhyanga* improves peripheral circulation, reduces muscle fatigue and stiffness, and enhances neuromuscular endurance, thereby supporting weakened muscles commonly affected in Myasthenia Gravis. *Dr. Madhukar et.al* in their study stated that *Abhyanga* stimulates the nervous system which in turn effects the muscular system, glands and vessels [28].
- **Swedana (Sudation therapy):** *Swedana* alleviates *Stambha* (stiffness), *Gaurava* (heaviness), and facilitates the proper movement of *vata* by opening microchannels (*Srotoshodhana*) [29]. It improves tissue oxygenation and metabolic activity, reduces muscle tightness and enhances flexibility. It facilitates better absorption and action of medicated oils. *Swedana* performed after *Snehana* enhances muscle relaxation and functional capacity (*Shushkanyapi hi kashthani namyanti yathanyayam*) [30], supporting weakened muscles in Myasthenia Gravis.
- **Basti:** In *Ayurveda*, *Basti* is referred as “*Ardha chikitsa*” and the main treatment modality in *vata* predominant disorders [31]. *Niruha Basti* acts systemically by regulating *Vata* at its main site (*Pakwashaya*) [32]. *Anusree et.al* in their study explained about gut microbiota, modulations of gut microbiota could be a possible line of next generation management of musculoskeletal disorders by breaking pathogenesis at *ama* and *dhatu* level. *Basti* is the most relevant choice for this as the route of administration of *Basti* has nervous and vascular innervations which are helpful for drug absorption [33]. It also modulates the gut-immune axis, which may influence autoimmune activity. It enhances systemic nourishment and promotes detoxification; thereby improves neuromuscular signalling and reduces generalized weakness. In Myasthenia Gravis, *Niruha Basti* helps in correcting systemic *Vata* imbalance, thereby supporting long-term functional improvement.
- **Nasya (nasal administration of medicated oils):** It is particularly beneficial in disorders involving the head and neck region (*Urdhva Jatrugata*/Supra clavicular region) as described by *Acharya Charak* (*na cha asya roga sahaya prabhavanti urdhava jatruja*) [34]. In *Ayurvedic* classics the mode of action of *Nasya* is said to be through *Shringataka Marma* which may correlate with functions of Pituitary Gland, Thyroid Gland and Neurochemical Pathway [35]. It gives a clue that *Nasya* may be helpful in supporting neuromuscular coordination. This therapy may be useful specifically in ocular manifestations of Myasthenia Gravis, such as ptosis, diplopia, and facial muscle weakness. A Case study done by Naina et al supports the role of *Pratimarsha nasya* (with *Dhanvantara taila*) in Myasthenia gravis [36].

- **Dhoompana**^[37]: It helps in clearing *Kapha-Vata* obstructions in the channels of the head and neck, thereby restoring the normal movement of *Vata*. It clears respiratory passages and improves airway functions. It enhances oxygenation and vocal cord efficiency, thereby supporting respiratory and bulbar muscle functions in Myasthenia Gravis.
- **Tarpana** is a specialized ocular procedure in which medicated ghee is retained over the eyes for a fixed duration. From an *Ayurvedic* perspective, *Tarpana* nourishes the ocular tissues (*Kriyalaghavam*)^[38], pacifies *Vata* and *Pitta* dosha, and strengthens the muscles and nerves of eyes. In the context of Ocular Myasthenia Gravis, *Tarpana* may help improve ocular muscle endurance, reduce eye fatigue, dryness, and irritation, thus supporting functional stability of extraocular muscles. From a modern viewpoint, the lipid-rich medium used in *Tarpana* may provide sustained lubrication, improve tear film stability, and enhance local tissue nourishment, thereby reducing ocular strain and discomfort as commonly seen in Ocular Myasthenia Gravis.
- **Bidalaka**^[39]: It involves the application of medicated herbal paste over the closed eyelids. It alleviates local *Vata* and *Pitta* imbalance, reduces inflammation, and relaxes periocular muscles. *Bidalaka* may help relieve eyelid heaviness, fatigue, burning sensation, and local discomfort associated with ptosis and ocular muscle weakness but may serve as beneficial adjunctive therapies in managing ocular symptoms specifically.
- **Rasayana** (immunomodulator)- *Ashwagandha* (*Withania somnifera*) is being studied for the treatment of many diseases associated with inflammation in the body, such as Cardiovascular, Pulmonary, Autoimmune diseases, Diabetes, Cancers, and Neurodegenerative Diseases. *Ashwagandha* supplementation has been shown to significantly increase muscle strength and to stimulate muscle renewal processes^[40]. *Guduchi*^[41] and *Shatavari*^[42] are classified as *Balya dravyas* in *Ayurveda* which may play a supportive role in the management of Myasthenia Gravis when used internally. *Balarishta* is being used to cure gastric problems as restorative and as prime tool for the treatment of Arthritis, Rheumatism and all other Autoimmune disorders^[43].

Case studies on many Ayurvedic Herbomineral formulation like *Purna Chanadrodyasa Rasa*, *Shwasa Kasa Chintamani Rasa*, *Jivantyadi Ghrita*, *Sameerpannaga Rasa*, *Mashabaladi Kwatha*, *Vidaryadi kwatha* have been found successful in treating patients of Myasthenia Gravis^[44].

CONCLUSION

Myasthenia gravis is a complex autoimmune neuromuscular disorder with a well-recognized bimodal age distribution. Although no definitive cure is there, effective symptomatic treatments are available in modern medicine. Moreover Ayurvedic interventions may serve as supportive measures, contributing to holistic patient care. Accurate scientific representation and balanced integration of traditional and modern perspectives provide a rational and comprehensive approach to disease management. Use of Ayurvedic procedures, *Balya* and *Rasayana* drugs judiciously can play a significant role in management of Myasthenia Gravis.

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