



## Case Study

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### ROLE OF AYURVEDA IN THE MANAGEMENT OF MYASTHENIA GRAVIS: A CASE STUDY

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#### ABSTRACT

Myasthenia Gravis (MG) is a neuromuscular junction disease that leads to varying degrees of skeletal muscle weakness with fatigue. The underlying defect in diseases is a decrease in the number of available acetylcholine receptors (AChRs) at postsynaptic neuromuscular junctions due to the binding of autoantibody at acetylcholine receptors. The most commonly and firstly affected muscles are those of the eyes, i.e., ocular muscles leading to drooping of eyelids because of more availability of receptors in less surface area of muscle, later leads to symptoms like difficulty in swallowing leading to (dysphagia), Difficulty to speak (dysarthria), other skeletal muscles fatigability etc. In Ayurveda, we cannot correlate to any particular diseases, but it can be understood in view of upahata dhatu ushma, srotas and marutha, respectively, leading to avarana to the normal functioning of vata. The present study was conducted to determine the efficacy of Ayurvedic management in Myasthenia gravis. In this paper, a case of 47 years old female who was diagnosed with myasthenia gravis (MG) with autoimmune hypothyroidism for 13 years was reported to complain of drooping of eyelids, pain and stiffness at the nape of the neck and bilateral shoulder joints, disturbed sleep, reduced appetite, with occasional diplopia, dysphagia, which got aggravated for six months, hence she approached OPD of SKAMCH&RC, Bengaluru. Considering the signs and symptoms patient was treated on the line of kaphavruta vata, and by considering urdwajatrugata lakshana shirodhara, greevabasti along with nasya line of treatment was adopted, and when a patient got relief in her symptoms, and she was wanted to continue her treatment hence virechana was adopted for sroto shodhanartha. Treatment shows significant improvement in her symptoms without any side effects.

**Keywords:** Myasthenia gravis, Upahata dhatu, Diplopia, Nasyakarma, Shirodhara, virechana

#### INTRODUCTION

Myasthenia gravis, the word is derived from the Greek word "mys", which means "muscle", and "astheneia" means "weakness", and in Latin- gravis means "serious".

Myasthenia gravis is the weakness of muscles<sup>1</sup>. The incidence of myasthenia gravis is 3 to 30 per million people each year. Diagnosis is becoming more common due to increased awareness. It is more seen in women under 40 and men over 60 and is uncommon in children<sup>2</sup>.

Myasthenia gravis is an autoimmune neuromuscular junction disorder characterised by progressive fatigable weakness, particularly of the ocular, neck, facial and bulbar muscles. The cardinal symptom is the abnormal fatigable weakness of the muscles; worsening towards the end of the day or following exercise is characteristic. Intermittent ptosis and diplopia are common symptoms, but weakness in chewing, swallowing, speaking, and limb movement also occurs<sup>3</sup>. The pathophysiology of myasthenia gravis mainly explains the production of autoantibodies against the acetylcholine receptors (AChRs) or muscle-specific tyrosine kinase (MuSK) proteins at neuromuscular junctions (NMJs)<sup>4</sup>.

There is no direct reference to the disease similar to Myasthenia gravis in Ayurvedic texts but based on nidana, roopa, upashaya, and anupashaya, and a probable diagnosis can be made and treated accordingly. Considering the symptomatology of the diseases as well as limitations of its treatment in contemporary science, effective and better treatment modalities were adopted in the present case to improve the patient's quality of life.

#### CASE REPORT

##### Aim and objectives

To evaluate the effect of Ayurveda intervention in managing myasthenia gravis.

##### Chief complaints

- Frequent feeling of heaviness and drooping of upper eyelids, either unilateral or bilateral.
- Pain at the nape of neck radiating to right upper limb and difficulty to lift above head
- Weakness and fatigability in bilateral lower and upper limbs.
- Disturbed sleep
- The occasional difficulty in swallowing food.
- Occasional double vision in both eyes.

## History of present illness

A female patient name XYZ, 47 years old, was healthy 14 years back in April 2008. She gradually noticed increasing weight, muscle weakness, and dry skin, so she consulted a doctor who advised her to thyroid profile investigation; the result came as low T3, and T4 levels and increased TSH levels and Anti TPO positive started with Levothyroxine sodium 100mcg. Patient consent was taken before participation in the study.

In 2012 April she noticed heaviness and drooping of the left upper eyelid, which was disturbing her during her work, so she consulted a doctor at a military hospital and underwent blood investigations for antibodies against acetylcholine receptors and MuSK proteins, which came as antibodies against Ach receptors and Repeated nerve conduction was done which came positive and she was diagnosed with Myasthenia gravis and advised her to take tablet containing Pyridostigmine 30 mg per day, but symptoms didn't reduce such a dose of pyridostigmine increased to 60 mg per day along with 25 mg prednisolone then she was able to manage her symptoms.

In 2013 because of stress in the workplace and tensions in the family, once again in February, the symptoms like ptosis, fatigue and weakness increased along with double vision in both eyes, so she once again consulted her doctor and her dose of prednisolone was increased to 120mg in tapering dose, and she continued medicine till September 2014.

In September 2014, she had bronchitis and got admitted to the hospital. On doctors' advice, she discontinued her MG medicines and was given antibiotics; after discharging from the hospital, she didn't continue her MG medicines and was managing her mild symptoms by taking rest.

In 2019 June she consulted an Ayurvedic physician in Kerala and advised with a set of medicine (medicines unknown) and continued the same medicine till 2021, but she was not able to cope with her symptoms mean while symptoms got aggravated after testing positive for COVID 19 virus which was managed at home.

Hence, she came to SKAMCH & RC for further management.

## Investigations

- Antibodies against Acetylcholine receptors (AChRs)
- CT chest: Negative for Thymoma or Thymus hyperplasia
- RNS (Repetitive nerve stimulation test): Positive

## Vrutti Vrutanta

- Occupation: worked as a nurse in the operation theatre and post-operative wards.
- Duration: 21 years
- Working timings: daily 6-10 hours
- Working type: long-standing,

## General Examination

- General physical examination revealed that patient is well built, well nourished,
- Pallor, Icterus, Clubbing, Cyanosis, Lymphadenopathy, and Edema, are absent
- Pulse: 80/min, Regular, normal rhythm and volume

- Respiratory rate: 18 / min, Regular, Abdomino -thoracic
- Blood pressure: 110/90mmhg, right arm supine position
- Tongue: Coated

## Systemic Examination

- **Higher mental functions:** Intact, Mood – Anxiety
- **Central nervous system:** The patient was conscious and oriented to time, place and person
- **Cranial nerves:** Intact, CN XI Accessory Nerve, Right side - shrugging of the shoulder was unable to do on the right side
- **Sensory functions:** Intact
- **Motor functions: Muscle tone:** Mild hypotonic on right upper limb, Muscle power: 4/5 (In right Arm)
- **Respiratory System:** No abnormality detected
- **Cardio Cardiovascular:** No abnormality detected
- **Gastrointestinal tract:** No abnormality detected

## Special tests for fatigability

### Forward abduction of limb for 5 min

Right upper limb: Was unable to hold for 5 min; felt fatigued within 2 min.

The left upper limb was able to hold for 4 minutes.

Right lower limb was able to hold for 4 minutes

The left lower limb was able to hold for 5 minutes.

**Gazing upwards for 20 seconds:** Felt weakness in right upper lid than left

**Forcefully opening of eyelids:** Was possible quickly.

**Counting numbers up to 20 without a break:** Can be able to say without any problem

**Musculoskeletal examinations:** No abnormality detected

## Dashavidha Pareeksha

Patient was of kapha vataja prakruti, with madhyama samhanana, pramana, satmya with avara satva, aharashakti and vyayama shakti. And was doing nidana like Aharaja: Abhishyanda ahara (Bread + butter, jam), curd rice daily, katu rasa pradhana (Chinese food like noodles), and Dessert (Sweets) after dinner. Viharaja: Exposure to Air condition daily for 8-12 hours, five days a week for 21 years, Vegadharana (Mutra, Nidra, Ksusha) Standing constant for 8 to 10 hours, Manasika: Chintna, Shoka, Bhaya. Dosh: Vatakapha, Dushya: Rasa, Rakta, Mamsa, Prakruti: Chirakari, Desha: Sadarana, Kala: Vasanta ritu, Bala: Madyama.

## Samprapti Gataka

**Dosha:** Vata, (vyanavata pradana) kapha

**Doshya:** Rasa, Rakta, Mamsa, Meda, Sira, snayu

**Agni:** Jataragni, Dhatvagni

**Srotas:** Rasavaha, Mamsa vaha, Medovaha, Asthivaha

**Srotodushti prakara:** Sanga.

**Udbhava stana:** Amashaya

**Vyaktastana:** Sarvanga

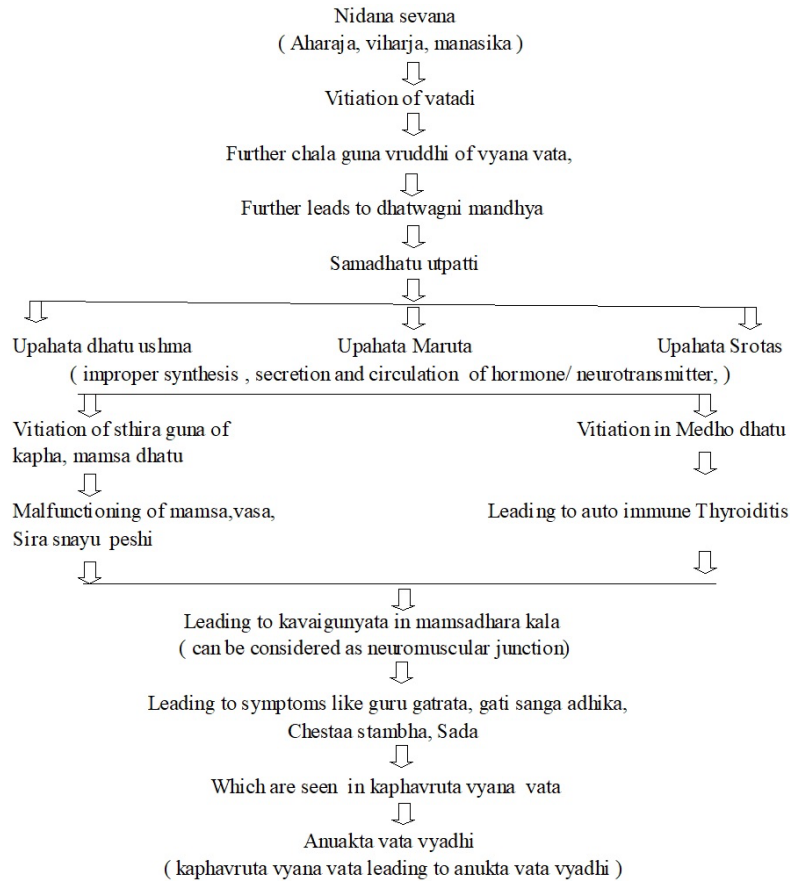
**Adhistana:** Rasadhatu, Mamsadhatu

**Rogamarga:** Madyama

**Sadyasadyata:** Yapyata

## Understanding of samprapti

We cannot completely correlate or compare with myasthenia gravis condition; based on lakshana here, an attempt is made to understand the probable Samprapti



Flow chart 1: Samprapti of Amavata

**Vyadhi Nirnaya**

Based on History, Clinical symptoms, the Examination case was diagnosed as

- Anukta vata vyadhi
- Generalized myasthenia gravis with subclass IIIa.

Table 1: Treatment given with improvement at the hospital

Date	Treatment given	Observations
19/3/2022 to 20/03/22	Sarvanga churna pinda sweda with kolakulatthadi churna f/b Sarvanga nadisweda Shirodhara with ksheerapaka of Jatamamasi 50cgmc+ Musta churna 50 gm + Amalaki churna 50 gm + 1 lit ksheera + 1 tender coconut water Stanika abhyanga over bilateral shoulder joint with mahanarayana taila f/b atasi upanaha  Orally Bhadradarvyadhi kashaya + ksheerabala 101, (10 ml +10 drops+ 20 ml of water (B/F) G.H taila 1 tsf with ½ glass of warm water at bedtime	Frequent feelings of heaviness and ptosis of the upper eyelid persist. Weakness of both upper and lower limb. Disturbed sleep. Pain at the nape of the neck and right shoulder persist. Hard stools persist. Reduced appetite
21/3/22 to 28/3/22	CST with Greeva Basti with Mahanarayana taila + Karpooradi taila Nasya with Ksheerabala 101, 12drops to each nostril (mukha abhyanga with MNT) Physiotherapy (IFT+ US+ Exercise Therapy) Panchakola churna (1/2 tsf - 0 - 1/2 tsp with hot water)	Sleep improved. Appetite improved. The feeling of weakness and fatigue was reduced slightly. Mild improvement in the feeling of heaviness of eyelids and drooping of eyelids. Pain at the nape of the neck and shoulder region reduced up to 50%. Patient was able to walk 1 km without fatigue
29/3/22 to 8/4/20	Snehapana with Mahatiktaka ghrita for 4 days (samyak snigdha lakshana) 3 days vishramakala Sarvanga abhyanga with Mahanarayana taila followed by Baspa sweda Virechana karma with 80gms ml of trivrut avaleha, ushnajala anupana Samsarjana karma for 3 days	Total no of vega – 14. Weakness improved. Fatigability reduced. Increased appetite. Decreased frequency of ptosis. The feeling of lightness in the body. Feeling fresh after getting up in the morning
11/4/22 to till now	Bhadradarvyadi kashaya + Ksheerabala 101 drops (10 ml kashaya with 10 drops oil, B/F, BD) Kalyanaka ghrita (1 tsf twice a day with warm water, b/f)	Improvement in overall symptoms

**Table 2: Improvement was assessed based on the gradation system developed by the Myasthenia gravis foundation of America<sup>5</sup>**

Symptoms with grading	Before treatment	After treatment	During follow up
Talking Normal – 0 Intermittent slurring or nasal speech -1 Constant slurring or nasal speech can be understood – 2 Difficult to understand speech – 3	0	0	0
Chewing Normal – 0 Fatigue with solid food -1 Fatigue with soft food -2 Gastric tube -3	1	0	0
Swallowing Normal – 0 Rare episodes of choking -1 Frequent choking necessitating changes in diet -2 Gastric tube – 3	1	0	0
Breathing Normal – 0 Shortness of breath with exertion -1 Shortness of breath at rest -2 Ventilator dependent -3	1	0	0
Impairment of ability to brush teeth or comb hair None -0 Extra effort, but no rest periods needed -1 Rest periods needed -2 Cannot do one of these functions -3	2	1	0
Impairment of ability to arise from a chair None – 0 Mild - sometimes uses arms -1 Moderate - always uses arms -2 Severe - requires assistance -3	1	0	1
Double vision None – 0 Occurs but not daily -1 Daily but not constant -2 Constant -3	1	0	0
Eyelid drop None– 0 Occurs but not daily -1 Daily but not constant -2 Constant – 3	2	1	1

## DISCUSSION

Myasthenia Gravis is caused by a defect in the neuromuscular transmission of nerve impulses to muscles. It occurs when normal communication between the nerve and muscle is interrupted at the neuromuscular junction by the production of antibodies against acetylcholine receptors. Usually, when impulses travel down the nerve, the nerve endings (at the presynaptic end) release a neurotransmitter substance called acetylcholine. Acetylcholine travels through the synaptic cleft, binds to acetylcholine receptors on the post-synaptic nerve ending, and generates a muscle contraction<sup>6</sup>. In Myasthenia Gravis, antibodies are produced against the postsynaptic receptor and hamper the normal physiological conduction at the neuromuscular junction, preventing muscle contraction. The body's immune system produces these antibodies. Myasthenia Gravis is an autoimmune disease because the immune system mistakenly attacks itself, which generally protects the body from foreign organisms. The pathophysiology of this disease MG can be understood in Ayurveda based on upahata dhatu ushma, srotas and marutha respectively<sup>7</sup>. The homeostasis of synthesis, secretion and action of the hormone are all under the control of vata (vyana vata), which is the chalanatmaka dravya in the sharira. Suppose the gati of vata is obstructed due to avarana by kapha, which further hampers. In that case, rasa rakthadi paribhrhana; hence proper dhatuposhana does not happen (This can be understood as antibodies in MG attack a normal human protein, the nicotinic acetylcholine receptor, or a related protein called Musk, a muscle-

specific kinase this leads to impairment in the neuromuscular junction). Chakrapani says dhatu themselves are nutrients for the other dhatu. The urja of sharirdhatu depends upon anupahataadhatushma (synthesis), anupahatamarutha (secretion), anupahatasrotas (action of hormone), and dhatuposhak rasavahi vyana vata (circulation). Dhatuposhak rasavaha srotas explained in vividhaashicetha pithiya adhyaya of Charaka Samhita if any impairment in these factors leads to “kha vaigunya” in specific sthanas and leads to the manifestation of disease.

As explained in samprapti and based on lakshana, it was diagnosed as kaphavruta vyanavata<sup>8</sup> leading to anukta vata vyadhi, and based on lakshana and avastha of person, the kaphavruta line of treatment was adopted “kaphavrute kaphagnaisthu maarutsyaanulomannaih<sup>9</sup>”.

The patient had more saama vyata symptoms. To get relief from saamata, the rukshana line of treatment was adopted by sarvanga udwarthana which helps in removing kaphavarana to vyana vata and brings sthirata into the body<sup>10</sup>, udwarthana was done with kolakulathadi churna which has drugs more of ushna virya and ruksha guna which helps to reduce saamata in the body.

**Mode of action of Greeva basti:** The patient had more pain at greeva pradesha. Greeva basti was adopted, which has both the properties of snehana and svedana. It is included under bahihparimārjana chikitsā. Mahanaryana taila was used for

greevabasti which is indicated in all vatavyadhi and helps to get relief of shoola and sthambata in greeva pradesha<sup>11</sup>, and the patient had more stiffness at the shoulder joint; hence sthanika abhyanga over shoulder joints followed by atasi upanaha<sup>12</sup> over bilateral shoulder joints was done to get relief of pain and stiffness.

**Mode of action of Shirodhara:** The patient had more anxiety about her diseases, was mentally disturbed and was in her premenopausal period. To relieve that, shiroksheerodhara was adopted. Shirodhara is a type of Murdhini taila<sup>13</sup> where pressure and vibration are created over the forehead, and the hollow sinus amplifies this vibration in the frontal bone. The vibration is then transmitted inwards through the fluid medium of the cerebrospinal fluid (CSF), and thus this vibration, along with slight temperature, may activate the functions of the thalamus and basal forebrain, which then brings the amount of serotonin and catecholamine to the normal stage inducing the sleep<sup>14</sup>. Continuous and rhythmically pouring of ksheera also leads to a state of concentration, enhances serotonin's release, and produces chemical substances like acetylcholine. And pacifies the aggravated vata dosha in shira and balances the prana vayu and vyana vayu around the head.

**Mode of action of Nasya karma:** 'Nasa Hi Shiraso Dwaram<sup>15</sup>'. The nose is the gateway of the head, and the drug administered by this route pervades the head and soothes the disorders. The medication is administered through the nose as nasya reaches the brain and eliminates the morbid doshas responsible for producing the diseases. Nasya is indicated in urdwajatrugata vikaras. The patient had more of urdwajatrugata lakshana; hence nasya was adopted as the main action of Nasya is 'Ghanonnata Prasanna Twak Skanda Greeva Asya Vakshasaha<sup>16</sup>'. From this, we can understand that nasya with taila, which has brimhana, balya property provides strength to the greeva pradesha, in this condition nasya with ksheera bala taila 101 times avrutitita has been selected which has properties of brimhana, balya, rasayana effect and vata hara<sup>17</sup>. It helps to nourish the sira and snayu through nasya karma and further helps to improve the strength of the bahu.

**Mode of action of Virechana:** Virechana (medicated Purgation) eliminates morbid humour through the body's downward track from the body<sup>18</sup>. Virechana is the process that helps in the evacuation of toxins. Some research data correlated acetylcholine with vata, catecholamine with pitta, and histamine with kapha. Studies observed that after virechana, there was a reduction in the plasma catecholamine contents in the patients to a significant level<sup>19</sup>. Virechana eliminates all morbid doshas from all micros to macro nourishing channels and regulates vata dosha, thus decreasing the symptoms at the srotas level<sup>20</sup>.

## CONCLUSION

We cannot correlate myasthenia gravis to any particular disease in Ayurveda; as explained by Acharya, if a physician cannot name a specific condition, he should not feel ashamed of it because it is not possible to name all types of diseases in definite terms. So, the physician should try to diagnose the disorders based on the nidana, dosha, and site of manifestation. Here an attempt was made and improved the patient's symptoms by considering the patient's symptoms and was treated with a line of urdwajatrugata vikara with nasya greevabasti, shirodhara, and the patient got a good result. The overall improvement is all signs were satisfactory.

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