



Case Study

AYURVEDIC MANAGEMENT OF MOTOR NEURON DISEASE

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ABSTRACT

Motor neuron disease (MND) is a neurodegenerative disorder characterized by the degeneration of both upper and lower motor neurons. Amyotrophic lateral sclerosis (ALS) is the most common form of MND. ALS is a severe neurodegenerative disorder with upper and lower motor neuron deficits in the limbs, affecting about 2 per 100,000 person/years. Brachial amyotrophic diplegia (BAD), a rare ALS variant, primarily presents with asymmetric lower motor neuron weakness, mostly affecting the upper extremities. A 75-year-old male patient diagnosed as motor neuron disease was admitted to Sri Sri College of Ayurvedic Science and Research in Bengaluru, Karnataka, on April 22, 2023 for 12 days, presenting with complaints of weakness and heaviness of both upper limbs associated with muscle wasting predominantly on right shoulder and wrist for 1 year. The clinical and laboratory features suggested a diagnosis of brachial amyotrophy diplegia, a regional variant of ALS. According to Ayurveda, *Avarana vatavyadhis* are found to have close resemblance to Motor Neuron Diseases and his symptoms can be correlated to *Kaphavruta Vyanavata*. The patient received *Avaranagna* and *Vata vyadhi chikitsa*. Assessment was done before and after treatment by using the ALSFRS-R. A satisfactory improvement was observed in the clinical findings as well as marked reduction was noted in the assessment scale. This case study suggests that brachial amyotrophic diplegia can be effectively managed symptomatically with Ayurvedic therapy.

INTRODUCTION

Motor neuron disease (MND) is a neurodegenerative disorder characterized by the degeneration of upper and lower motor neurons in the spinal cord, cranial nerve nuclei and motor cortex. The annual incidence is approximately 2 per 100,000 individuals, with a prevalence of around 7 per 100,000. While most cases are sporadic, about 10% are familial. The disease typically presents after the age of 50 and is rarely seen before the age of 30. It is more common in males than females.^[1] The diagnosis of Motor Neuron Disease is specifically coded as G12.21 in the ICD-10-CM.^[2]

MND is largely incurable, with an average life expectancy of only 2 to 3 years after the onset of symptoms.^[3] Survival beyond 3 years is uncommon, though rare cases exist where individuals survive for a decade or more. Riluzole, a sodium-channel blocker that inhibits glutamate release, can slightly slow disease progression, typically extending life expectancy by an average of 3–4 months.^[4]

Amyotrophic lateral sclerosis (ALS) is the most common form of MND. The term 'amyotrophy' refers to the atrophy of muscle fibres resulting from denervation due to anterior horn cell degeneration, while 'lateral sclerosis' refers to the hardening of the anterior and lateral corticospinal tracts, which are gradually replaced by gliosis.^[5] ALS is one of the most severe neurodegenerative disorders, characterized by a combination of upper and lower motor neuron deficits in the limbs. ALS occurs globally, with an incidence of approximately 2 per 100,000 person-years and a prevalence of 4.5 per 100,000 people.^[6] Brachial amyotrophic diplegia (BAD) is a rare segmental form of motor neuron disease and a

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regional variant of ALS, which primarily presents with asymmetric lower motor neuron weakness, mostly affecting the upper extremities.^[7] Isolated variants of ALS tend to progress more slowly than classical ALS and are associated with longer survival.^[8] Therefore, treatment should focus on overcoming or minimizing the various disabilities associated with the condition.

This condition can be correlated to '*Kaphavruta Vyanavata*,' which presents with symptoms like *Gati skhalithatvam* (impairment in movement) and *Guru gatravvam* (a feeling of heaviness in the body).^[9] Treatment approaches such as *Avaranahara* (clearing occlusions) and *Vata vyadhi hara* (addressing disorders caused by morbid *Vata*) are effective in managing these symptoms.

Case Report

A 75-year-old male patient, diagnosed with brachial amyotrophic diplegia, a regional variant of ALS/MND based on clinical and laboratory findings, visited Sri Sri College of Ayurvedic Science and Research in Bengaluru, Karnataka, on April 22, 2023. He presented with complaints of weakness and heaviness in the bilateral upper limbs (Right>Left), difficulty to lift right upper limb, wasting of muscles in bilateral shoulder, hands and upper back with frequent cramps and fasciculations for 1 year.

His weakness was initially in the intrinsic muscles of both hands, particularly the right little and ring fingers, thenar, and hypothenar muscles. It gradually spread to the proximal right arm and shoulder girdle, eventually involving the left arm after 6 months. The onset was sudden as he noticed a loss of strength in his right hand and hyperflexion of the little and ring fingers upon waking one morning. He was unable to extend his fingers from this hyper flexed position, which began interfering with his daily activities. He struggled to perform delicate tasks such as cutting vegetables, holding utensils, or using small tools. Despite taking medications and consulting several neurologists, his condition worsened. Following the advice of physicians, he underwent EMG and nerve conduction studies (NCS), which confirmed the diagnosis of MND. He then started medication and physiotherapy.

He also developed wasting on muscles of left hand and restricted movement of bilateral upper limbs above the level of shoulder joint over the past 6 months. Involuntary fasciculation was evident throughout the upper limbs and upper back. From 4

months. Patient noticed 9kg gradual reduction in weight (55kg to 46kg). For all these complaints patient came for Ayurvedic management.

History of Past Illness

No significant past illness.

Family History

There is no relevant family history contributing to the current situation of the patient.

Personal History

Ahara – Vegetarian diet

Mala – Once in a day, satisfied

Mutra – 4-5 times/day, 0-1 time/night

Vihara- Divaswapna (2-3hrs/day)

Agni – *Jataragni mandya*

Nidra – *Nidralpata* (5-6 hrs/night, disturbed)

Psychological history – *Chinta, Shoka* due to illness

Treatment History

For the past 1 year, he is under medication Tab. Rilutor 50mg, Cap. Qugress along with physiotherapy.

Physical Examination

- Built – Lean built
- Nourishment - Moderately nourished
- Pallor- Absent
- Icterus- Absent
- Clubbing- Absent
- Cyanosis- Absent
- Edema- Absent
- Lymphadenopathy- Absent
- Temperature-98.2°F
- Blood pressure: 130/80 mmHg
- Respiratory rate- 22 cycles per min
- Pulse rate- 72 beats per min
- Spo2- 96%
- Height- 160cm
- Weight- 46kg
- BMI- 17.96 kg/m² (underweight)

Systemic Examination

- ❖ **CVS**– S1, S2 heard, no murmurs.
- ❖ **CNS**– Patient was conscious, well oriented to time place and person.
Higher mental functions– Normal, all cranial nerves- intact
- RS**– Normal bronchovesicular sounds were heard over bilateral chest walls.

Table 1: Motor function of upper limb

Motor function	Right upper limb	Left upper limb
Muscle power	3/5	4/5
Tone	Hypotonic	Hypotonic
Involuntary movements	Present	Present
Bulk of muscle	Mid arm circumference=24.3cm	Mid arm circumference=24 cm
Muscle wasting	Present	Present
Rom	Shoulder, elbow- Restricted due to weakness, passive movements- possible	Shoulder, elbow- Restricted due to weakness passive movements - possible

- GAIT –Normal gait.

Lower limb motor function and sensory function are normal.

Deep Tendon Reflexes

Table 2: Deep Tendon Reflexes

Reflex	Right	Left
Biceps	Diminished	Diminished
Triceps	Diminished	Diminished
Brachioradialis	Diminished	Diminished
Knee	Normal	Normal
Ankle	Normal	Normal

Coordination test normal.

Ashta Sthana Pareeksha

Jiwha – lipta

Naadi – Vata Kapha pradhana mandanadi

Mala – Prakruta

Mootra – Prakruta

Shabdha –Prakruta vak

Sparsha –Ruksha

Druk –Prakruta

Aakruti – Krusha

Dashavidha Pareeksha

Prakruti- Vata Kapha Prakruti

Vikruti- dosha –vata pradhana

Dushya –rasa, mamsa, meda

Sara-Madhyama

Samhanana - Avara

Pramana - Avara

Satva-Madhyama

Saatmya-Sarva rasa satmya

Ahara shakti

Jarana and Abhyavarana shakti-Madhyama

Vyayama shakti-Avara

Vaya- Vriddha

Previous investigation

Electromyography dated on 14/06/2022 (EMG) shows suggestive of brachial amyotrophic diplegia, a regional variant of ALS/MND.

Diagnosis

Based on symptoms of the patient, investigation reports and examination findings together confirmed the diagnosis of brachial amyotrophic diplegia, a regional variant of ALS/MND.

Treatment schedule: Details of Ayurvedic medications and external procedures from April 22, 2023 to May 11, 2023 are summarized in Tables 3.

Table 3: Treatment schedule

Dates	Procedure	Medicine	Duration	Observations
22/04/23 to 24/04/23	<i>Dhanyamla dhara</i>	<i>Dhanyamla</i>	3 days	Lightness in the body and increased appetite
25/04/23 to 03/05/23	<i>Sarvanga Abhyanga</i> followed by <i>Shashtika shali pinda Sweda</i>	<i>Ashwaganda bala lakshadi taila</i>	9 days	Reduced weakness and muscle wasting
25/04/23 to 03/05/23	<i>Raja yapana basti</i>	<i>Makshika</i> - 50 ml <i>Saindhava lavanam</i> - 10gm <i>Sneham</i> - <i>Bala aswagandhadi taila</i> 100ml <i>Kalkam</i> - <i>Shatapushpa, Madhuka, Kutajaphala, Priyangu, Rasanjana</i> - 30gm <i>Kwatham</i> - <i>Daruharidra, Kutaja, Priyangu, Shatapushpa, Musta, Bala, milk</i> - 250ml <i>Avapa</i> - <i>Ajamamsa rasa</i> - 100ml. Total 540ml.	9 days	Ranges of movements are improved.

During Admission (22/04/23 to 03/05/23)

1. Tab. *Chitrakadi vati* 1BID before food
2. Tab. *Ekgangaveera rasa* 125mg BID after food
3. Cap. *Ksheerabala 101 Avarti* 1 BID before food
4. *Balarista* 15ml BID after food with normal water

Discharge medicines (04/05/23 to 03/06/23)

1. Tab. *Ekgangaveera rasa* 125mg 1 BID After food
2. Cap. *Ksheerabala 101 Avarti* 1 BID Before food
3. *Lasuna rasayana* 1tsp at 7am in empty stomach with warm milk
4. *Balarista* 15ml BID After food with normal water
5. *Ashwaganda bala lakshadi taila* for external application followed by hot water bath.
6. Advised *Pathya-apathya* X 1 month

Assessment

The assessment was based on the scoring of Amyotrophic Lateral Sclerosis Functional Rating Scale Revised (ALSFRS-R), which consists of 12 items (questions). Each question is rated on 5-point (0-4) scale. (Table 4)

Table 4: ALSFRS-R scores at different time periods of treatment 0= severely affected, 4= Normal

Parameters	Before Treatment	After Treatment	Follow up after 1 month
Speech	4	4	4
Salivation	4	4	4
Swallowing	4	4	4
Handwriting	2	3	4
Cutting food	2	4	4
Dressing and Hygiene	2	4	4
Turning in bed	2	4	4

Walking	3	4	4
Climbing stairs	3	4	4
Dyspnea	4	4	4
Orthopnea	4	4	4
Respiratory insufficiency	4	4	4

DISCUSSION

The current condition is considered as *Avarana janya Vataroga* specifically termed '*Kaphavruta Vyanavata*' due to its close resemblance to the clinical features of Motor Neuron Disease (MND). The aggravated *Kapha* causes *Avarana* (obstruction), leads to *Vata prakopa* and produces '*Kaphavruta Vyanavata*'.^[10] The treatment plan was designed to slow the disease progression and enhance the strength of weakened limbs. Therefore, therapies with *Amapachana*, *Deepana*, *Avaranahara*, *Vatashamaka*, *Brimhana*, and *Balya* properties were chosen. The concept of treating the *Avaraka* first in *Avarana janya vatavyadhi* was implemented, beginning with therapies aimed at mitigating the occluded *Kapha dosha*.

Dhanyamla dhara was performed. *Dhanyamla* alleviates *Vata-kapha* due to its *Ushna guna* and *Ushna veerya*. It is antagonistic to *Ama* and *Meda* and aids in *Sroto avarodha*. The *Amla rasa* of *Dhanyamla* promotes *Deepana* and *Amapachana*. It possesses the action of *Deha Sthairyra*, *Agni Sthairyra*, *Pustikara* and *Sroto Shodhana*.^[11]

Shastika Shali Pinda Sweda^[12] is a *Brimhaniya Snehika sweda* performed by bolus of boiled *Shastika Shali* with *Vata hara Kwatha* (decoction of *Vata hara* herbs) and milk. The qualities of *Shastika* include *Snigdha* (unctuous), *Guru* (heavy), *Sthira* (stable), *Sheeta* (cooling) and *Tridoshaghna* (balancing all three *Doshas*). The drugs used in *Shastika Shali Pinda Sweda* such as *Brimhana*, *Snigdha* and *Vata Shamaka* properties are antagonistic to vitiated *Vata*. *Bala mula Kwatha* supports the nourishment of muscular tissues and helps prevent muscle weakness. Therefore, *Shastika Shali Pinda Sweda* is one of the most preferred methods of *Swedana* for Motor Neuron Disease (MND) patients, where muscle wasting and weakness are present.

Basti is considered as *Ardha chikitsa* for *Vata dosha*. The *Brimhana* variety of *Basti*, specifically *Raja Yapana Basti* using *Sneha dravya* like *Ashwagandha Bala Lakshadi Taila*, has demonstrated its efficacy in this condition and helps to counteract the *Dhatukshaya* (tissue depletion) caused by *Vata*. *Raja Yapana Basti*^[13] Possesses *Tikta rasa*, *Jeevaniya* and *Balya* qualities, acts as a *Brimhana* (nourishing), *Vatahara* (*Vata-*

alleviating), *Balya* (strengthening), *Dhatu vridhdhikara* and *Rasayana* (rejuvenating) therapy.

Chitrakadi vati which counteracts *Vata dosha* by its *Usna virya*, *Snigdha*, *Tikshana guna* and also performs *Deepana* and *Pachana*. *Ekangaveera Rasa* pacifies vitiated *Vata Kapha Dosha* and eliminates *Srotorodha* through its *Madhura Tikta*, *Katu*, *Kashaya Rasa*, *Ushna veerya*. *Lasuna* by its *Guru Snigdha Guna* and *Ushna Veerya*, aids in alleviating *Vata dosha* and eliminating *Avarana*.^[14] *Acharya vagbhata* emphasized the significant role of *Lasuna* as a *Rasayana* in treating *Vata Avaranas* except those associated with *Pitta* and *Rakta*.^[14] *Ksheerabala 101 Avarti* capsule contain *Bala*, which is *Guru*, *Snigdha guna* and *Sheeta Veerya* and acts as *Brimhana* and *Vatahara*.^[15] *Balaarista* which is *Vatahara* and *Balya*, which provides strength to the muscles. Externally, *Ashwaganda bala lakshadi taila* acts as *Balya*, *Brimhana* and *Vatashamaka*.

CONCLUSION

- There was moderate improvement in both gross and fine motor activities of the patient, with a gradual increase in upper limb strength, reduction in symptoms, decreased disability and improved quality of life.
- This case study demonstrates that brachial amyotrophic diplegia can be effectively managed symptomatically with Ayurvedic treatment.

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