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Case Study

# AYURVED MANAGEMENT OF AMYOTROPHIC LATERAL SCLEROSIS (MOTOR NEURON DISEASE)

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## ABSTRACT

Motor neurons are nerve cells that send electrical output signals to the muscles, affecting the muscles' ability to function. Motor neuron disease (MND) can appear at any age, but the symptoms usually appear after the age of 50 years. It affects more males than females. The most common type of MND is amyotrophic lateral sclerosis (ALS). A 56-year-old male patient had heaviness and weakness in left lower limb for 4 months. The condition rapidly progressed in the 4 months prior and found difficulty in climbing stairs and swelling in the left foot. Gradually he developed slowness of speech hence consulted allopathic hospital and treated with glutamate blockers, muscle relaxant and physiotherapy. His response to allopathic medications found to be slow. The present case report deals with the case of MND and its Ayurvedic diagnosis and management. Difficulty in differential diagnosis exists between the conditions like *Sarvanga Vata, Avrita Vata* and *Saama Vata. Upashaya-Anupashaya Pariksha* is beneficial to solve the problem in differential diagnosis*. Swedana* and *Matra Vasti* procedures are found to be beneficial in the management of MND.

## INTRODUCTION

Motor neuron disease (MND) is a progressive condition characterized by degeneration of upper and lower motor neurons. Motor neurone disease is relatively uncommon with an annual incidence of 2 in 100 000 and prevalence of 5-7 per 100000[1-3]. The term Amyotrophic lateral sclerosis (ALS) is used synonymously with MND[4]. Amyotrophic lateral sclerosis is the most common form of progressive motor neuron disease[5]. ALS is considered to be a neurodegenerative disorder usually affecting the motor functions of either limbs (limb onset) or head and neck (bulbar onset) or both (multifocal) exhibiting symptoms related to either Upper motor neuron disease (UMN) or Lower motor neuron disease (LMN) or both[6]. This disease can be correlated to *Kaphavrutavata*. The usual course of ALS is unremittingly progressive, although in some cases course of progression may be prolonged[7]. As per Ayurveda, each patient of MND needs a different approach as the etiology and pathology are variable. Ayurveda mentions *Kaphavrutaudanavata*[8], *Kapha-vrutavyanavata*[9] having *Lakshanas* (symptoms) which are similar to that of various types of MND. Clinical features like *Vakswara-graha* (difficulty in speech), *Dourbalya* (generalized weakness), *Sarvagatragurutva* (heaviness), *Aruchi* (anorexia) and *Vaivarnya* (loss of luster of the skin) pertaining to *Kaphavrutaudanavata* can be related to multifocal onset of ALS and hence the treatment was planned with Ayurvedic intervention following the protocols of *Kaphavrutavata*[10] which includes *Swedana* (sudation), *Niruhabasti* (medicated enema), *Virechana* (purgation) and *Sarpipana* (oral medicated ghee) along with other oral medications.

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### Case Report

A 56 years old male patient was presented to our hospital with history of muscle weakness in bilateral upper and lower limbs associated with slurred speech, imbalance in walking, heaviness especially in both lower limbs, tremors, wasting of both upper and lower limbs for the past 1 year. Patient had developed constipation, abdominal gaseous distension and loss of appetite initially. The patient was on hypertensive medication since 2 years. Patient was non-smoker, non-alcoholic. At the time of examination, patient was found emaciated and his weight is 29kg. He was anxious, alert and responding to vocal commands. Speech was slurred and difficult to

understand without the help of patient's bystander. Higher mental functions were normal. Fasciculations of the tongue were observed. Muscle tone was increased in both upper and lower limbs. All the tendon reflexes were exaggerated and extensor plantar response was found. Spasticity of the fingers and wasting was observed. So, for all these complaints he consulted a neurologist and advised for Concentric Needle electro Myograph, Nerve conduction study. Hematological reports, ECG (Electrocardiogram), liver and kidney function tests were within normal limits. MRI of brain showed prominence of bilateral sylvian fissures. No evidence of significant mass effect or midline shift was seen in MRI of brain. Nerve conduction was eventually normal and EMG (Electromyography) shows chronic denervation at rectus femoris, tibialis anterior and biceps muscle.

**On Examination**

1. *Nadi* /Pulse - 68/min
2. *Mala* (stool)- *Malavshtambha* (constipation)
3. *Mutra* (urine)- *Peetavarniya*
4. *Jihva* (tongue) - *Samata*
5. *Kshudha* (appetite)- *Mandya*
6. *Shabda* (speech) - *Prakrut* (normal)
7. *Sparsha* (skin) - *Prakrut* (normal)
8. *Akruti – Madhyam*
9. *Bala – Madhyam Raktadab*
10. (B.P.)- 110/70mmHg
11. *Druk* (eyes) - *Pita Varniya*

**Central Nervous System Examination**

1. Higher Motor Functions - Intact
2. Consciousness- Conscious
3. Orientation to- Time, place, person- Intact
4. Memory- Recent- not affected, Remote- not affected
5. Intelligence- Intact
6. Hallucination and delusion - Absent
7. Speech - Slow and words are mumbled

**Examination findings**

The power of the muscles was assessed using MRC (Medical Research Council) scale [11] and is mentioned in Table 1. DTR (Deep Tendon Reflex) in bilateral upper and lower limbs were exaggerated and their grading is presented in Table 2.

**Table 1: MRC (Medical Research Council) scale**

| Muscles | Right side Scoring out of 5 | Left side Scoring out of 5 |
|---|---|---|
| Biceps | 4 | 4 |
| Deltoid | 4 | 4 |
| Triceps | 4 | 4 |
| Abductor pollicis brevis | 2 | 3 |
| Extensor carpi radialis | 2 | 3 |
| Quadriceps | 4 | 4 |
| Interossei | 1 | 2 |

**Table 2: Showing grading of DTR before the treatment**

| DTR | Right side grade | Left side grade |
|---|---|---|
| Biceps | 4 | 4 |
| Triceps | 4 | 4 |
| Brachioradialis | 4 | 4 |
| Patellar | 4 | 4 |
| Achilles tendon | 4 | 4 |
| Babinski sign | Positive | Positive |

**Treatment Plan[12]**

1. *Shodhana*
2. *Rasayana* therapy

**Internal Medication**

**Table 3: For this 21-day patient was given following as internal medication**

| Medication | Dose | *Anupan* |
|---|---|---|
| *Vishtinduk Vati* | 250mg 2 TDS | *Jal* |
| *Brihat vata Chintamani*[13] | 250mg 2 TDS | *Ghrit* |
| *Ekangavirras* | 250mg 2TDS | *Ghrit* |

**Table 4: *Shodhana***

| **Treatment procedure** | |
|---|---|
| *I. Snehan* | |
| *II. Shashtika Sali Pinda Swedam* | • Rice bag fomentation<br>• *Shalishtika Sali* (*Oryza sativa* Linn) boiled in decoction of *Bala* (*Sida cordifolia* linn) and milk |
| *III. Basthi Chikitsa* (enema therapy) | *Yogabashti* (Enema therapy)<br>➢ *Anuvasana* with *Sahachar tail* 150ml<br>➢ *Niruh Basti* with *Erandamolaadi Basthi*- 800 ml<br>➢ *Rajayapana Basthi* - 800ml for 1 month |
| *IV. Nasya* | • *Shadbindu Tail* 4 drops in each nostril |
| *V. Padabhyang* | • *Narikel tail* |

**Diagnosis and Assessment**

A criterion of assessment was based on the scoring of Amyotrophic Lateral Sclerosis Functional Rating Scale Revised (ALSFRS-R). This is composed of 12 items (questions). Each question is rated on 5-point (0-4) scale. The 12 Questions of ALSFRS-R asks about speech, swallowing difficulties, motor functions and respiratory problems.[14]

| **Speech** | **Grade** | **Salivation** | **Grade** |
|---|---|---|---|
| Normal | +4 | Normal | +4 |
| Detectable speech disturbance | +3 | Slight but definite excess of saliva in mouth; have nighttime drooling | +3 |
| Intelligible with repeating | +2 | Moderately excessive saliva; may have minimal drooling | +2 |
| Speech combined with non-vocal communications | +1 | Marked excess of saliva with some drooling | +1 |
| Loss of useful speech | 0 | Marked drooling; requires constant tissue or handkerchief | 0 |
| | | | |
| **Swallowing** | | **Handwriting** | |
| Normal eating habits | +4 | Normal | +4 |
| Early eating problems; occasional choking | +3 | Slow or sloppy; all words are legible | +3 |
| Dietary consistency changes | +2 | Not all words are legible | +2 |
| Needs supplemental tube feedings | +1 | Able to grip pen but unable to write | +1 |
| Nothing by mouth; exclusively parenteral or internal feeding | 0 | Unable to grip pen | 0 |
| | | | |
| **Cutting food and handling utensils** | | **Dressing and hygiene** | |
| Normal | +4 | Normal function | +4 |
| Somewhat slow and clumsy but no help needed | +3 | Independent and complete self-care with efforts or decreased efficiency | +3 |
| Can cut most foods although clumsy and slow; some help needed | +2 | Intermittent assistance or substitute methods | +2 |
| Food must be cut by someone but can still feed slowly | +1 | Needs attendant for self-care | +1 |
| Need to be fed | 0 | Total dependence | 0 |
| | | | |
| **Turning in bed and adjusting bed cloth** | | **Walking** | |
| Normal | +4 | Normal | +4 |
| Somewhat slow and clumsy but no help needed | +3 | Early ambulation difficulties | +3 |

| | | | |
|---|---|---|---|
| Can turn alone or adjust sheets but with great difficulty | +2 | Walks with assistance | +2 |
| Can initiate but not turn or adjust sheets alone | +1 | Non-ambulatory functional movement | +1 |
| Helpless | 0 | No purposeful leg movement | 0 |
| | | | |
| **Climbing stairs** | | **Dyspnoea** | |
| Normal | +4 | None | +4 |
| Slow | +3 | Occurs when talking | +3 |
| Mild unsteadiness or fatigue | +2 | Occurs with one or more of the following; eating, bathing, dressing | +2 |
| Needs assistance | +1 | Occurs at rest, difficulty breathing when either sitting or lying | +1 |
| Cannot do | 0 | Significant difficulty, considering using mechanical respiratory support | 0 |
| | | | |
| **Orthopnea** | | **Respiratory insufficiency** | |
| None | +4 | None | +4 |
| Someone difficulty sleeping at night due to shortness of breath; does not routinely use pillows | +3 | Intermittent use of BiPAP | +3 |
| Needs extra pillows in order to sleep | +2 | Continuous use of BiPAP during the night | +2 |
| Can only sleep sitting up | +1 | Continuous use of BiPAP during the night and day | +1 |
| Unable to sleep | 0 | Invasive mechanical ventilation by intubation or tracheostomy pen | 0 |

The response to the treatment was done by the symptomatic assessment of patient.

**After completion of 7 days-** Improvement in finger movements like

- Opposing other fingers with thumb.
- Typing in computer key board.
- Holding tumbler
- Raising hand up to the switch board. (90 degree)
- Switch on and off the lights and fans.
- He could lift and hold a mug of water for bathing.

**After completion of 14 days**

- It was noted that the quality of letters written by patient were getting better some days and, on some days, it was not up to mark.
- Typing on key board was successful.

**After completion of 21 days**

- Patient was able to lift and rotate (Circumduction) his right upper limb to an angle of 360° with drooping wrists and left hand with a good erected wrist.
- He was able to fold fairly the bed sheet without much ground or bed support.
- He was able to hold and eat 8-9 spoons of food with the right hand.
- He was able to switch on the button of his vibrating tooth brush with his right finger, using nail strength, which was previously done with left finger.
- Removing the dirt in his nail using opposite nails which indicates fine motor movement.

**Table 5: Showing ALSFRS-R scores at different time periods of treatment 0= severely affected, 4=Normal**

| Parameters | Before treatment | After treatment |
|---|---|---|
| Speech | 2 | 3 |
| Salivation | 2 | 3 |
| Swallowing | 3 | 4 |
| Handwriting | 3 | 4 |
| Cutting food | 1 | 4 |
| Dressing and Hygiene | 2 | 3 |
| Turning in bed | 3 | 3 |

| | | |
|---|---|---|
| Walking | 2 | 3 |
| Climbing stairs | 0 | 1 |
| Dyspnea | 4 | 4 |
| Orthopnea | 3 | 4 |
| Respiratory insufficiency | 4 | 4 |

## DISCUSSION

Amyotrophic lateral sclerosis is difficult to treat and in Ayurveda we can find the *Kaphavrutavata* features similar to that of patient symptoms. Hence in the present case was given *Shodhana, Bruhmana* as well as *Rasayana* line of therapy. The patient was advised to follow the strict *Pathya Ahara* and was advised to refrain from day sleep so as to avoid all the aggravating factors of *Vata*. Hence therapies having *Deepana* (appetizer), *Ama Pachana* (digestives), *Vatashamaka* (pacify *Vata*), *Bruhmana* (Nourishing) and *Balya* (strengthening) properties were selected. *Brihatvata-chintamani Rasa* is the best *Vatahara* drug especially in neurological debilities.

*Swedana* helps to pacify *Kapha* and lead to removal of the occlusion to *Gati* (movement) of *Vata* especially in *Udanavatavaha Srotas* (channels). The relief observed in orthopnea could be attributed to this removal of *Kapha* occluding *Udanavatavaha Srotas*. At this stage the main aim is to remove *Avaraka Dosha* and so drugs such as *Brihatvatachintamani Rasa* were administered. *Brihatvatachintamani Rasa* is the best *Vatahara* drug especially in neurological debilities. *Vishtinduk Vati* has *Tikta* (bitter), *Katuras* and has *Ushna Virya*. Reduces *Kapha Dosha* pacifies *Vata Dosha* aggravation associated with excess *Kapha.* The benefits of *Vishtinduk Vati* include aid in digestion, treating fatigue, low energy, constipation and low blood pressure. In low dosage, it improves muscle tone and strengthens nerve.

*Vasthi* and *Nasya* play a key role in maintaining the normal course of *Vata*. In *Vasthi*, rectal route administration of medicated oil or instantly prepared emulsion drug mixture is executed. The patient is allowed to retain the same for a considerable period of time or according to the retaining capacity. Such an administration can bypass the hepatic metabolism of drug[15]. Rectal drug administration can ensure a comparatively faster absorption of drug. An expected liposomal activity of the medicated oil can thus help in the easy distribution of drug to the target cells. *Nasya,* the intranasal medicine administration, owns the potential to cross the blood brain barrier. The *Sneha Paka* (generally medicated *Ghee* or oil preparations) which may contain a polar active principle surrounded by the non-polar oil medium[16], can be easily absorbed from the endothelial cells of brain capillaries into the brain cells.

***Erandamooladivasthi***: Removes the dislodged *Doshas* which are directed into the *Koshta*. Suitable in condition like muscle wasting, caused by *Vata Dosha*, ataxia by *Kapha Prakopa* and *Vatakshaya.*

***Rajayapana Vasthi*:** *Mamsa Agnibala Sukra Vivardhana'*.[17]

***Shali pindasweda***: Strengthens *Mamsadhatu* (providing muscle tone).

## CONCLUSION

A systematic treatment protocol including both internal and external treatment was adopted. The treatment protocol involved *Snehana- Swedana, Shodhana* and *Rasayana*. The treatment thus executed for duration of 21 days had an optimistic impact on the disease, which was shown by the drop in the symptoms

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