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An Ayurvedic Approach to Amyotrophic Lateral Sclerosis - A Case Report

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ABSTRACT

Amyotrophic Lateral Sclerosis (ALS) is the most common form of progressive motor neuron disease, which characterised by progressive degeneration of cells of the lower cranial motor nuclei, anterior horn cells of the spinal cord and neurons of the motor cortex extending to the pyramidal tracts. ALS with multifocal onset might exhibit muscle stiffness & weakness in upper and lower limbs, muscle twitching, atrophy, slurred speech, dysphagia and loss of dexterity. In Ayurveda contexts, the signs and symptoms pertaining to ALS can be related to *Kaphavruta Udanavata*. In the present study the patient was presented with slurred speech, dyspnoea, reduced strength in right pollex, digitus secundus & medius, difficulty grasping objects in right hand, heaviness in right upper limb and dysphagia. The treatment administered were *Snehana, Swedana, Matra Basti, Shiropichu and Shamana Oushadhi* for a period of 42 Days (In patient – 12 days & Out patient – 30 days). The functional rating scale for ALS- revised (ALSFRS-R) was used for assessment. The ALSFRS-R scale before the treatment was 23 which was increased to 29 With remarkable improvement in dysphagia and moderate improvement in speech, strength in right pollex, digitus secundus and Medius and dyspnoea. The treatment was probably effective in preventing the late-stage complications of the disease, thereby improving the quality of life.

Key words: Amyotrophic Lateral Sclerosis, Motor Neuron Disease, *Kaphavruta Udanavata, Basti, Panchakarma*.

INTRODUCTION

Motor neuron diseases (MND) occur due to selective loss of function of the lower and upper motor neurons controlling the voluntary muscles of the limbs or bulbar region.^[1] Its pathologic hallmark is death of lower and upper motor neurons or corticospinal motor neurons.

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Amyotrophic lateral sclerosis (ALS) is the commonest among MND. The term 'amyotrophy' refers to atrophy of muscle fibres consequent to denervation of muscles due to anterior horn cell degeneration and 'lateral sclerosis' refers to sclerosis or hardening of anterior and lateral corticospinal tracts which are replaced by progressive gliosis.^[2] The prevalence of this disease is said to be 4.5 per 100,000 populations and in the year 2016 alone it is estimated that 34,325 deaths occurred due to MND globally, and in India around 5 cases per 100,000 people have been recorded by Foundation for Research on Rare Diseases and Disorders. The aetiology of ALS remains undetermined with 90% to 95% of cases occurring as sporadic. Between 5% and 10% of cases of MND are familial, and mutations in the free radical scavenging enzyme superoxide dismutase (SOD-1) and in a number of other genes, including transactive response DNA binding protein-43 (TDP-43) and mutations in FUS gene, have been identified.^[3]

MND is incurable for the most part and average life expectancy is only 2 to 3 years from the onset of symptoms. There is no accurate treatment for the disease albeit the class of drugs like anti-glutaminergic drugs (benzothiazoles), edaravone, masitinib and benzodiazepines are used to prevent complications associated with prognosis of the disease.^[4]

Ayurveda mentions *Kaphavruta Vata* having *Lakshanas* which are similar to that of various types of MND. Clinical features like *Vakswara-Graha*, *Dourbalya*, *Sarvagatra Gurutva* pertaining to *Kaphavruta Udanavata*^[5] can be related to multifocal onset of ALS and hence the treatment was planned with Ayurvedic intervention following the protocols of *Kaphavruta Vata*^[6] which is "*Kaphaghna Marutasyanulomana*", includes *Swedana*, *Niruhabasti*, *Virechana* and *Sarpipana* along with other *Shamana Oushadhi*.

CASE REPORT

Patient Information

A 58 years old female, diagnosed case of ALS, presented to the outpatient department of SDM Hospital, Hassan was admitted under IPD NO: 069443 with the presenting complaints of reduced strength in right pollex, digitus Secundus and Medius, which lead to difficulty in grasping the objects in right hand, dysphagia, slurred speech, dyspnoea associated with heaviness in right upper limb for the past 10 months. The patient had no past medical history, reported absence of smoking or alcohol consumption. Appetite, Sleep and Bowel habits were normal and family history was not significant.

Initially patient noticed weakness in right pollex, digitus Secundus and Medius with hyper flexed posture and mild dysphagia during liquid intake, for which she neglected to take medical advice for 2 months. Later on, she developed progressive weakness in right pollex, digitus Secundus and Medius, unable to flex her digits which lead to difficulty in grasping the objects, this began troubling her day-to-day activities and was unable to perform delicate tasks such as cutting vegetables & holding utensils, dysphagia during liquid & solid food intake followed by slurred speech,

dyspnoea, heaviness and occasional fasciculations in right upper limb. For these complaints she consulted a neurologist on 21/02/2023 and she was advised for Concentric Needle Electro-Myograph (CNEMG), Nerve Conduction Study (NCS) and blood profile tests. NCS and Blood profile were insignificant but CNEMG showed first FDI Denervation and Right Biceps showed no spontaneous activity, tongue showed occasional fasciculations suggestive of preganglionic neurogenic lesion – Amyotrophic Lateral Sclerosis. Patient was started with Tab. Rituximab 50mg OD for the duration of one month, but no improvement was seen in the symptoms and she visited to various hospitals, found no reduction in the symptoms. Patient was continuing Tab. Rituximab 50mg OD for the past 7 months.

Clinical Findings

General and Physical Examination

Presenting a neat and tidy general appearance, the patient was conscious, well oriented, and displaying a normal gait but reduced arm swing. There was slight drooping of shoulder to right and shoulder muscles were seen flaccid and weak. She possesses a moderate built with a height of 160cm, weight of 63kg, and a calculated body mass index of 24.6kg/m². Pallor, icterus, cyanosis, clubbing, oedema and lymphadenopathy were notably absent. Vitals were recorded within normal limits.

Systemic Examination

Respiratory System - on auscultation, normal broncho vesicular sounds heard and no abnormality detected.

Cardiovascular System - S1, S2 heard and no abnormality detected.

Per abdomen - non-tender, no organomegaly detected.

Central Nervous System - conscious, oriented to time, place & person

Higher mental function - Intact

Cranial Nerve Examination - Glossopharyngeal nerves

Vagus nerves Affected - Slurred speech, Dyspnoea,

Hypoglossal nerves & Dysphagia

Motor Functions

Table 1: Motor examinations

Muscle Power on Flexion & Extension	Right Upper Limb	Left Upper Limb
Fingers	2/5	5/5
Wrist	3-/5	5/5
Elbow	3/5	5/5
Shoulder	3/5	5/5
Muscle Tone	Normotonic	Normotonic
Deep Tendon Reflexes		
Biceps, Triceps & Brachio radialis	Diminished (1+)	Normal (2+)
Palmar Reflex	Present	Absent
Fasciculations	Present	Absent
Muscle Atrophy	Absent	Absent

Diagnostic Assessments

- MR Angiogram of intracranial & extracranial vessels as suggested by neurologist was done on 21/02/2023 shows no focal stenotic or occlusive lesions
- Concentric Needle Electro-Myograph (CNEMG) as suggested by neurologist was done on 23/02/2023 shows first FDI Denervation and Right Biceps showed no spontaneous activity, tongue showed occasional fasciculations suggestive of preganglionic neurogenic lesion – Amyotrophic Lateral Sclerosis.
- MRI – Cervical Spine was done on 16/04/2023 shows mild diffuse disc bulges at C5-6 & C6-7 levels, abutting the bilateral C6 & C7 nerve roots respectively.

Patient has satisfied the El Escorial Criteria for MND/ALS by World Federation of Neurology.

Diagnosis: *Kaphavruta Udana Vata* / Amyotrophic Lateral Sclerosis (MND)

Therapeutic Intervention: The details of *Shamana Oushadhi* and *Bahya Karma* from 25/08/2023 to 05/09/2023 are summarized in Table 2 and Table 3.

Table 2: Shamana Oushadhi prescribed

<i>Shamana Oushadhi</i> 25/08/2023 - 05/09/2023	Dose	Time
<i>Dhanwantara Vati</i>	1-1-1	Before food
<i>Cap.Rasaushadi Yoga</i>	1-1-1	After food
<i>Maharasnadi Kashaya</i>	15ml-15ml-15ml	After food
<i>Haimavathi Vacha Choorna</i>	5g-5g-5g (With Honey - to rub over tongue)	After food
<i>Nadi Kashaya</i>	100ml-0-0	After food
<i>Tab. Anulomana</i>	0-0-1	After food

Table 3: Bahya Karma done

Date	Procedure	Days
25/08/23 & 26/08/23	<i>Sarvanga Udwartana</i> followed by <i>Bashpa Sweda</i>	2 days
25/08/23 – 05/09/23	<i>Shiropichu</i> with <i>Ksheerabala Taila</i>	12 days
27/08/23 – 05/09/23	<i>Sarvanga Abhyanga</i> with <i>Nirgundi Taila</i> followed by <i>Jambira Pinda Sweda</i> <i>Veshtana</i> to right upper limb with <i>Nirgundi Taila</i> <i>Matra Basti</i> with <i>Kalyanaka Ghrita</i> (80ml)	10 days

Discharge Medications (30 days):

- Dhanwantara Vati* 1-1-1 before food
- Brihat Vata Chintamani Rasa* with gold 1-1-1 after food
- Saraswatharishta* 15ml-15ml-15ml after food
- Tab. Anulomana* 0-0-1 after food

FOLLOW-UP AND RESULT

A follow-up was done after 30 days of being discharged and significant improvement in the clinical findings as well as marked reduction was noted in the assessment scales.

The condition of the patient was improved gradually along with the course of treatment. There was remarkable improvement in dysphagia and moderate improvement in speech, strength in right pollex, digitus Secundus & Medius and dyspnoea. Significant improvement was noticed in grasping the objects in right hand.

Assessment Scales

Table 4: Motor Functions

Muscle Power Right Upper Limb on Flexion & Extension	Before Treatment	After Treatment
Fingers	2/5	3+/5
Wrist	3-/5	4/5
Elbow	3/5	4/5
Shoulder	3/5	4+/5
Muscle Tone	Normotonic	Normotonic
Deep Tendon Reflexes Biceps, Triceps & Brachio radialis	Diminished (1+)	Normal (2+)
Palmar Reflex	Present	Present
Fasciculations	Present	Absent
Muscle Atrophy	Absent	Absent

Table 5: ALS Functional Rating Scale - Revised (ALSFRS-R)

Functions	BT Score	AT Score
Speech	3	3

Salivation	4	4
Swallowing	2	3
Handwriting	0	1
Cutting Food and Handling utensils	1	2
Dressing & Hygiene	2	3
Turning in Bed and Adjusting Bed Clothes	1	2
Walking	4	4
Climbing stairs	4	4
Breathing	2	3
Total	23	29

Table 6: Neuro-Quality of Life Scale

Domains	Max score	BT	AT
Communication	25	22	24
Ability to participate in social roles and activities	40	15	22
Anxiety	40	24	16
Depression	40	25	15
Emotional & behavioural dyscontrol	40	14	10
Fatigue	40	25	17
Lower extremity function (Mobility)	40	35	37
Positive affect and well-being	45	23	30
Sleep disturbance	40	10	08
Upper extremity function (Fine motor, ADL)	40	08	17
Stigma	40	20	19
Satisfaction with social roles and activities	40	16	21

Cognition function	40	28	32
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DISCUSSION

ALS with multifocal onset is difficult to manage especially if the duration of onset is longer. In Ayurveda we can find that *Kaphavruta Vyana* and *Udana Vatavyadhis* (when grouped together) have features almost similar to that of different types of ALS. The present case was given the treatment following generalized protocols of *Kaphavruta Vata Chitkita*.

Udwartana (~Powder massage/Rubbing): *Udwartana* is a form of *Abhyanga* that was done in *Pratiloma Gati* (against hair follicles). It was done with *Kolakulathadi Choorna*, this helped in *Shrotomukha Vishodhana*, removing the *Gurutwa*, *Tandra* and brings *Laghuta* to the body. It Stimulated both motor and sensory nerve endings in various parts of the body. This stimulation was carried along the sensory fibres of a nerve to the spinal cord and hence to the brain.^[7]

Bhaspa Sweda medicated decoction vapour was used, which possessed *Ushna* and *Teekshna* properties which helped in bringing *laghuta* to the body and also *Shrotomukha Vishodhana*.^[8]

Shiropichu: *Ksheerabala Taila Shiropichu* helped in pacifying the *Pitha & Vata Dosha* and nourished the *Indriya* (motor and sensory activity). *Pichu* was advised for 7–8 hrs. It worked through action on *Tarpaka Kapha* and *Prana Vayu*. *Shiropichu* probably helped in regularizing the blood supply of brain and reduced the neurological symptoms.^[9]

Abhyanga (~Oil massage): *Nirgundi Taila* was used for *Abhyanga*. *Nirgundi Taila* possess *Laghu Ruksha Guna*, *Ushna Veerya* acts *Kaphavatahara* and *Shoolahara* in action.^[10]

Jambeera Pinda Sweda is a type of *Snigdha Pinda Sweda* in which pieces of *Jambeera* (lemon) along with other drugs are roasted in a pan with little oil and a *Pottali* is prepared by tying in the cloth. The main ingredient of the *Pottali* being *Jambeera*, is *Amlarasatmaka* possess *Vatashamaka*, *Shoolaghna* and *Shothaghna* properties.^[11]

Matra Basti (~Oil Enema): *Vata* is seen as the main aggravating factor and *Basti Chikitsa* is regarded as the prime line of treatment for it. Medicated enema helps to eliminate vitiated *Dosha* from the body, increases the strength and spreads the potency of the drug due to its *Prabhava*. The potency of *Basti* drug acting on *Dosha* brings them into normalcy and provides them with nourishment. Just as the farm gets its nourishment from water supplied through channels, the whole body gets nourishment from *Virya* of the enema drug carried by five types of *Vata* through *Srotas*.^[12] *Matra Basti* was given with *Kalyanaka Ghrita* for 10 days helps in *Majja Dhatugata Vikara* and also has nootropic^[13] and neuroprotective property.^[14]

Shamana Aushadhi

Tab. Dhanvantara Vati: The major ingredients are *Ela*, *Shunti*, *Haritaki*, *Jiraka* helps in *Deepana*, *Vatanulomana*.^[15]

Rasaushadi Yoga: *Ekanga Veera Rasa*, *Maha Vata Vidvamsana Rasa*, *Vatakulantaka Rasa*, *Vata Gajankusha Rasa*, *Bala* and *Shuddha Shilajitu*- Each 160mg

Ekanga Veera Rasa explained in *Rasayoga Sagara* possesses *Deepana*, *Pachana*, *Teekshana*, *Bhrumhana* and *Rasayana* property.^[16]

Maha Vata Vidvamsana Rasa explained in *Rasa Tantra Sara* possesses *Vatahara*, *Balya* and *Rasayana* properties.^[17]

Vatakulantaka Rasa explained in *Bhaishajya Ratnavali* Possesses *Deepana*, *Vatahara*, *Brimhana* and *Rasayana* properties.^[18]

Vata Gajankusha Rasa explained in *Bhaishajya Ratnavali* Possesses *Deepana*, *Vatanulomaka*, *Balya*, *Rasayana*, *Vata Pradhana Tridosha Shamaka*.^[19]

Nadi Kashaya: It is a *Kashaya* prepared out of *Atasi*, *Rasna*, *Ajamoda*, *Shunti*, *Jeeraka*, *Bakuchi*, *Musta*, *Triphala*, *Bala* and *Dashamoola* proved to have *Vatahara* and *Balya* properties.^[20]

Maharasanadi Kashaya Ingredients have *Snigdha Guna*, *Ushna Veerya* Possess *Vata-Kapha Shamaka*, *Shoolahara* and *Brimhana* properties. *Snigdha Guna* of

drugs counter acts *Ruksha Guna Pradhanyata*, *Ushna Veerya* drugs counter acts *Sheeta Guna* of *Vata*.^[21] The chemical constituent of *Rasna* is Quercetin which is a flavonoid enhances neurogenesis and neuronal longevity by modulating a broad number of kinases signalling cascade, has the ability to reverse cognitive impairment, helps in memory enhancement and neuroprotective action.^[22]

Saraswatarishta contains mainly *Brahmi*, *Ashwagandha*, *Brahmi* and *Shatavari* which are *Medhya Rasayana* and claimed to be helpful for the management of acute anxiety, fatigue, insomnia, partial loss of memory, low grasping power, and slurred speech.^[23]

Ingredients of *Saraswatarishta* rescues the neurons from the scopolamine-induced neuroinflammation. Scopolamine, a nonselective muscarinic antagonist, stops cholinergic signalling and induces memory and cognitive impairment.^[24] Neuronal cell death by oxidative stress and progression of neurodegenerative disorders can be attenuated by the supplementation of antioxidants and free radical scavengers.^[25]

Bhrihat Vata Chintamani Rasa has the properties of *Medhya*, *Rasayana*, *Lekhana*, *Balya*, *Kshayagna*, *Ojovardhaka* & *Yogavahi* which has targeted effect for the management *Kaphavruta Udana Vata*.^[26] The ingredients of compound formulary were indicated as a stimulant, nervine, nootropic and rejuvenate which improves the acuity of mind.^[27] And also proven to have potent anti-inflammatory and anti-oxidant properties which will help in neuronal damage.^[28]

Haimavathi Vacha Choorna with *Vacha* being the main ingredient, by the virtues of its *Katu*, *Tikta Rasa*, *Ruksha Guna* and *Ushna Veerya* acts as *Kaphavata Shamaka*, *Medhya*, *Vakshaktivardhana* and *Swarakrit*.^[29] The chemical constituent of *Vacha* is asarone, beta- asarone, exhibit multiple pharmacological properties like anti-oxidant, anti-apoptotic and neuroprotective effect.^[30]

Tab. Anulomana: It is a combination of *Swarnapatri* (*Senna*), *Ajamoda*, *Jiraka*, *Haritaki*, *Yastimadhu*, *Shunti* and *Saindhava Lavana* helps in *Anulomana Karma*.^[31]

CONCLUSION

MND is a serious condition which affects the motor functions of the body. Multifocal onset of ALS can be challenging to treat especially when the duration of the disease is longer. Early diagnosis of the disease may help in preventing the complications. There was slight betterment in gross and fine motor activities of the patient with gradual gaining of upper limb power, reduction in her symptoms, decreasing the disability and improving quality of life. This case study demonstrated that Amyotrophic Lateral sclerosis can be satisfactorily managed and quality of life can be improved with *Ayurvedic* principles. So, this case was believed to be value documenting.

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