



Case Report

A case report: Ayurvedic intervention in motor neuron disease contemplating Kaphavrutavata

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ABSTRACT

Motor neuron disease (MND) otherwise referred as Amyotrophic lateral sclerosis (ALS) affects human life in various ways. ALS with multifocal onset might exhibit muscle stiffness and muscle weakness of upper and lower limbs, muscle twitching, atrophy, falling/tripping, slurred speech, difficulty in swallowing and loss of dexterity. In Ayurvedic contexts *Avarana vatavyadhis* are found to have close resemblance to MND. The patient presented with features of multifocal onset of ALS which can be related to *Kaphavruta Udanavata*. The treatment principle of *kaphavarana* including *Swedana* (~sudation), *Niruhabasti* (~medicated enema), *Vamana* (~therapeutic emesis) *Virechana* (~purgation) and *Sarpipana* (~oral intake of medicated ghee) along with other oral medications have been explained in Ayurvedic texts. In the present study, the same treatments were administered except for *vamana* due to patient's unwillingness. The Functional Rating Scale for ALS (ALSFRS-R) was used for assessment. The ALSFRS-R score before the treatment was 29 which was increased to 38 with remarkable improvement in Salivation and moderate improvement in Speech, Swallowing, Walking, Climbing stairs, Dyspnea and Orthopnea. The treatment was found to be highly effective in preventing the late stage complications which usually occur within 1–2 years of the disease onset and thereby helps the patient to be self-reliant.

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1. Introduction

Motor neuron disease (MND) is a condition wherein motor neurons in the brain and spinal cord gradually stop working due to degeneration. This may lead to dysfunction of the somatic muscles and in its final stages respiratory system gets affected which might even lead to death [1]. The prevalence of the 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 [2]. The proper understanding regarding the disease still needs to be done but it is believed that genetic mutations within superoxide dismutase 1 (SOD1) [3] and C9orf72 [4] is linked with its occurrence. MND mostly manifest in the form of Amyotrophic Lateral sclerosis (ALS) which accounts for 85% of the total cases [5] while remaining types like Progressive bulbar palsy, Progressive muscular atrophy and Primary lateral sclerosis are having comparatively lesser incidence rates. 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]. There is no accurate treatment for the disease albeit the class of drugs like anti-glutamatergic drugs (benzothiazoles), edaravone, mastinib and benzodiazepines are used to prevent complications associated with prognosis of the disease [7].

Ayurveda mentions *Kaphavrutaudanavata* [8], *Kaphavrutavyanavata* [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 lustre 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.

2. Case report

A 29 years old male patient (Fig. 1) was presented to our hospital on 17/04/2018 with history of muscle weakness in bilateral upper and lower limbs associated with slurred speech, imbalance in walking, heaviness especially in both lower limbs for the past 7

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Fig. 1. Patient after *Udwartana* with postural imbalance and claw hands.

months. The patient had no past medical history reported absence of smoking or alcohol consumption. Bowel habits were normal and family history was not significant.

Patient initially developed the weakness in bilateral lower limbs for which he was taken to the physician on 10/01/2018. He was advised for MRI whole spine which revealed mild disc bulge at L4-L5 and was administered with few analgesics and nerveine injections but symptoms persisted. Gradually he developed stiffness in bilateral lower limbs followed by tripping. Later the same things were noticed in bilateral upper limbs along with slurred speech. The patient was then referred to a neurologist on 24/02/2018 and he was advised for Concentric Needle Electro-Myograph (CNEMG), Nerve Conduction Study and blood profile tests. NCS and Blood profile were insignificant but CNEMG was suggestive of Motor Neuron Disease. Patient was started with benzothiazole medications but no improvement was seen meanwhile patient also experinced reduced appetite, impaired memory and fatigue. Patient was referred to various hospitals but did not find any improvement.

3. Examination findings

After admitting the patient in our hospital on 17/04/2018 thorough examination was done. The patient with steppage gait had

postural imbalance, slurred speech with slight impairment in memory (memory was assessed through questionnaire related to names, places, locations, relations, work and so on). The cranial nerve examinations were normal except for presence of tongue fasciculations. The sensory system was found intact. Muscles were normotonic with no evident wasting. 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.

The signs and symptoms of the patient, the investigation reports and examination findings together confirmed the diagnosis of multifocal onset of ALS. The ALSFRS-R scoring was considered for the assessment of the disease which comprised of following 12 variables [12].

The patient with *Kapha-vata prakruti* had *MADHYAMA* (~Moderate) *Agni* (~Digestives) *Pramana* (~Body Dimensions) *Vaya* (~age) *Aharashakti* (appetite) and *AVARA* (~Inadequate) *Sara* (~Body tissue essence) *Satmya* (~compatibility), *Samhanana* (~body compactness) *Satva* (~Tolerance) and *Vyayamashakti* (~Physical endurance).

The *kapha-vatotkleshaka nidana* (~causative factors) would aggravate *kapha* and *vata* respectively and in extreme conditions the aggravated *kapha* would lead to *avarana* (~occlusion) of *udana-vata-vahasrotas* (~channels of *udana-vata*). Due to obstruction to its own *gati* (~movement) *vata* gets vitiated and depending on the *srotas* it is being occluded respective symptoms occur [13]. Hence the malfunctioning of *udana*, *vyana* and *prana vata* can be noted in elements like *rasa* (~nutritional essence), *raktha* (~vascular tissue), *mamsa* (~muscular tissue), *medha* (~fat tissue), *majja* (~marrow) *snayu* and *kandara* (~Tendons and Ligaments).

4. Intervention

The treatment was planned according to the protocols of *Kaphavrutavata chikitsa* which included *Swedana* (~sudation) which was achieved with *Udwartana* (~rubbing of medicated warm and dry powder) and *Pradeha* (~application of medicated warm paste) followed by *Niruhabasti* (~medicated Enema) in *Yoga basti* pattern. It was followed by *Virechana* (~purgation) through *Nitya virechana* methodology and *Gruthapana* (~oral intake of medicated ghee) and oral medications. *Vamana* (~emesis) procedure was skipped citing the irritability of the patient. No other allopathic medications were administered during the course of Ayurvedic intervention. The timeline including procedures along with formulations administered is presented in Table 3.

The Patient was advised to follow the strict *Pathya ahara* (~Dietary regimen for the present condition) preferably freshly cooked. He was also asked to refrain from day-sleep and to avoid all the aggravating factors of *vata* and *kapha*. Few mobilizing and

Table 1
Showing muscle strength before the treatment.

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
Interossei	1	2
Quadriceps	4	4
Hamstrings	4	4
Tibialis anterior	3	3
Gastrocnemius	3	3

Table 2
Showing grading of DTR before the treatment.

DTR	Grades	
	Right side	Left side
Biceps	+4	+4
Triceps	+4	+4
Brachioradialis	+4	+4
Patellar (Knee reflex)	+4	+4
Achilles tendon (Ankle)	+4	+4
Babinski sign	Positive	

stretching exercises were also advised under the supervision of the attendant but were not strictly followed by the patient.

5. Follow-up and outcome

The patient did not appear for follow-up after 04/04/2019 as scheduled, however it was clarified from the patient's next to kin that status-quo maintained till January 2020 after which the data was not collected.

Table 3
Showing treatment techniques and schedule.

18/04/2018–22/04/2018	<i>Pachana</i> for 5 days	<i>T. Chitrakadivati</i> 500 mg 1 tid before food
22/04/2018–28/04/2018	<i>Udwartana</i> at 09:30 am Procedure- Rubbing of warm medicated powder over the body against the direction of hair follicles for 7 days.	<i>Kolakulattadi churna</i>
28/04/2018–04/05/2018	<i>T. Lashunarasayana</i> 500 mg [14] 1 tid <i>T. Brihatvatachintamani rasa</i> [15] 1 bd	
05/05/2018–11/05/2018	<i>Pradeha</i> at 09:30 am for 7 days Procedure- Application of the medicated paste in the opposite direction of hair follicles.	<i>Erandadipradeha</i> <i>Ernada</i> (<i>Ricinus communis</i> Linn), <i>Vasa</i> (<i>Adhatoda vasica</i> Nees), <i>Shigru</i> (<i>Moringa olifera</i> Lam), <i>Twakpatra</i> (<i>Cinamomum zeylenica</i> Blume) and <i>Saindava</i> (Rock Salt) processed with <i>Gomutra</i> (Cow's urine) to make paste and applied all over the body in the opposite direction of hair follicles.
12/05/2018–19/05/2018	<i>Niruha Basti</i> is administered in <i>Yoga basti</i> pattern for 8 days. Procedure- <i>Anuvasanabasti</i> is administered through rectal route after morning food on Day-1, Day-3, Day-5, Day-7 and Day-8. <i>Asthapanabasti</i> is administered on empty stomach after proper Oleation and Sudation on Day-2, Day-4 and Day-6.	<i>Murchitatilataila anuvasana</i> -80 ml <i>Erandamooladi Niruhabasti</i> [16]- 540 ml
20/05/2018–04/06/2018	<i>T. Lashuna Rasayana</i> 500 mg 1 tid <i>T. Brihatvatachintamani rasa</i> 125 mg bd	<i>Erandamoola</i> (Roots of <i>Ricinus communis</i> Linn)- 70 g, <i>Laghupanchamula</i> (Contains 5 drugs- <i>Solanum Indicum</i> , <i>Solanum Xanthocarpum</i> , <i>Desmodium Gangeticum</i> , <i>Uria Picta</i> , <i>Tribulus Terrestris</i>) <i>Rasna</i> (<i>Pluchea lanceolata</i> Oliver & Hiem), <i>Ashwaganda</i> (<i>Withania somnifera</i> Dunal), <i>Atibala</i> (<i>Abutilon indicum</i> Linn), <i>Guduchi</i> (<i>Tinospora cordifolia</i> Miers), <i>Punarnava</i> (<i>Boerhavia diffusa</i> Linn), <i>Aragwadha</i> (<i>Cassia fistula</i> Linn), <i>Devadaru</i> (<i>Cedrus deodara</i> Loud), <i>Madanaphala</i> (<i>Rubia cordifolia</i> Keay)-20 g each must be boiled with 8 parts of water and reduced to one-eighth- 330 ml decoction <i>Shatahva</i> (<i>Anethum graveolens</i>), <i>Hapusa</i> (<i>Juniperus communis</i> Linn), <i>Priyangu</i> (<i>Callicarpa macrophylla</i> Vahl), <i>Pippali</i> (<i>Piper longum</i> Linn), <i>Madhuka</i> (<i>Madhuca longifolia</i> Roxb), <i>Rasanjana</i> (<i>Berberis aristata</i> DC), <i>Indrayava</i> (<i>Holarrhena antidysenterica</i> Wall), <i>Musta</i> (<i>Cyperus rotendus</i> Linn) – altogether 40 g of paste. <i>Saindhava</i> (Rock Salt)-15 g <i>Madhu</i> (Honey)-30 ml <i>Taila</i> (Sesame oil)-50 ml <i>Gomutra</i> (Cow's urine)-75 ml
05/06/2018–19/06/2018	<i>Nitya Virechana</i> [17] Procedure- Administered orally on empty stomach at 06:00 am for 15 days.	<i>Aragwadhadhi gritha</i> -20ml
20/06/2018–10/07/2018	<i>Jeemasarpi</i> [10] 15 ml in the early morning. Cap. <i>Guduchi</i> 500 mg [18] 1 Tid	
11/07/2018–01/10/2018	<i>Bhargavaproktarasayana</i> [19] 15 g Bd with milk Syp. <i>Dhandhanyadi Kashaya</i> [20] 2tsp Tid	
02/10/2018–03/01/2019	<i>T. Lashuna Rasayana</i> 500 mg 1 Tid <i>T. Mahavatavidhwamsaka rasa</i> [21] 125 mg bd	
04/01/2019–04/04/2019	Cap. <i>Guduchi</i> 500 mg 1 Tid <i>Bhargavaproktarasayana</i> 15 g Bd with milk	

The results were assessed by using ALSFRS-R scoring parameters which includes 12 subjects each varying from 0 to 4 (5 grades) where 0 implies complete loss of function and 4 to be normal and the total score is calculated to assess the prognosis. Higher score indicates better chances of survival and lower score indicate bad prognosis. The assessment was made in different stages of treatment individually i.e., after *Swedana* (*Udwartana* & *Pradeha*), after *Niruhabasti*, *Virechana*, *Sarpipana* and during 1st follow-up and last follow-up. The scoring before the treatment was 29 while after the treatment and follow-up it was found to be 38. There was good improvement in speech, swallowing, cutting food, walking, climbing stairs and orthopnea and salivation was almost normal. But there was no improvement in fine movement activities like handwriting or buttoning the shirts or dress hygiene. The changes in scores noted at different time intervals are presented in Table 4.

The improvement in strength was observed at 1st follow-up in only three muscle groups i.e., left interossei 3/5, right APB 3/5 and right interossei 2/5 but it remained unchanged in other muscles. Deep tendon reflexes of both upper and lower limbs also remained unchanged. No changes were observed in plantar reflex.

Table 4
Showing ALSFRS-R scores at different time periods of treatment where 0 = severely affected and 4 = Normal.

Parameters	Before treatment	After Swedana	After Niruhabasti	After Virechana	After Sarpipana	After 1st Follow-up (2/10/18)	After 2nd Follow-up (4/1/19)
Speech	2	2	3	3	3	3	3
Salivation	2	2	3	3	4	4	4
Swallowing	3	3	3	3	4	4	4
Handwriting	2	2	2	2	2	2	2
Cutting Food and HU	2	2	2	2	2	3	3
D and H	2	2	2	2	2	2	2
TIB and Bed hygiene	3	3	3	3	3	3	3
Walking	2	2	2	2	2	3	3
Climbing	1	1	1	1	1	2	2
Dyspnea	3	3	3	3	3	4	4
Orthopnea	3	4	4	4	4	4	4
Respiratory insufficiency	4	4	4	4	4	4	4

6. 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 *udanavatavyadhis en masse* (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 chiktitsa*.

The flow chart depicts the plan of the treatment. (Fig. 2)

7. Probable mode of action

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 *udanavatavahasrotas*. At this stage the main aim is to remove *Avaraka dosha* and so drugs such as *Lashuna Rasayana* and *Brihatvatachintamani rasa* were administered. *Lashuna* has *Usna virya* (~hot potency) while *Brihatvatachintamani rasa* is best *Vatahara* drug especially in neurological debilities. Following *swedana*, *Niruhabasti* was administered in *Yoga basti* pattern to subside *Avruta dosha* (~Occluded) and thereby helping to resume normal functioning of *vata*. *Udanavata* which is responsible for speech is influenced by the administration of *Niruha basti* and hence improvement in speech is observed. The *Virechana* procedure being *shodana* (~detoxification) removes

aggravated *doshas* from the body which was administered in *Nitya virechana* pattern as the patient was intolerant of classical methodology of *virechana*. Later *Sarpipana* was planned. After *Shodana* followed by *Sarpipana* there were improvements in salivation and swallowing both of which are primarily operated by *udanavata*. *Purana sarpi* having *katu-tikta rasa* (pungent-bitter taste) with *tridoshahara* effect might be responsible for these improvements up to some extent. *Guduchi* was administered after detoxification therapies which plays important role in normalizing the *tridoshas* and is also referred to as *amruta* (~nectar). *Dhanadhanyadi kashaya* ingredients are predominantly *laghu* (~light), *rusksha* (~dry) *ushna virya* (~hot potency) *katu* (~pungent) *vipaka* (bio-transformation end product) and pacifies *vata* and *kapha*. It can be assumed that it acts at the level of *sira* (~blood vessels) and *snayu* (~ligaments) in *Madhyama rogamarga* (~Intermediate pathway of disease) while *Mahavatavidhwamsaka rasa* is also *Vata-kapha shamaka* which acts at the levels of *mamsa* (~muscles) and *asthi* (~Bones). *Bhargavap-rocket rasayana* was administered to achieve rejuvenation of the whole body. The further course of treatment was halted as the patient did not show-up for consultations.

The overall effect of the *Panchakarma* procedures along with oral medications efficiently delayed the progression of the disease. Hence respiratory symptoms did not worsen even after almost 2 years of onset of the disease beyond which the follow-up was lost.

8. 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.

Kaphavrutaudanavata can be considered for multifocal ALS where the treatment protocol of *Swedana*, *Niruhabasti*, *Virechana*, *Sarpipana* could be beneficial in helping the patient to a certain level and prevent end stage complications. The Ayurvedic intervention might help the patients of MND to be self-reliant as it is very essential factor for them. Further studies can be conducted in larger number and in different types of MND by following different treatment protocols mentioned for *Anyonyavarana*, *Pittavarana* and other forms of *Kaphavarana* after due consideration of the symptoms and stages of the disease.

Consent

A written informed consent was obtained from the patient's next-of-kin for publication of this case study with images and investigation reports. A copy of the written consent is available for review.

Removing *Avarana* (~Occluding) first i.e., *Kapha-avarana* which is achieved by

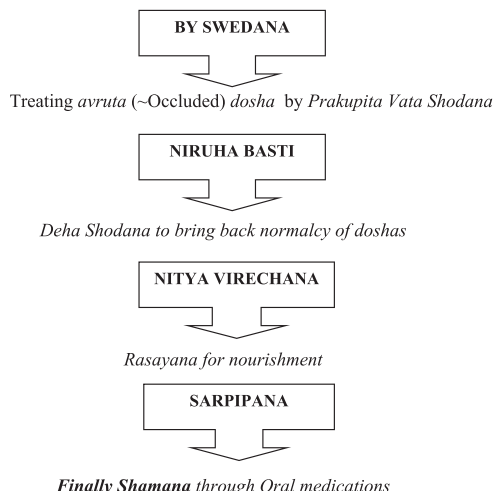


Fig. 2. Flowchart depicting plan of treatment.

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