

**AYURVEDIC INTERVENTIONS IN SPINAL MUSCULAR ATROPHY (SMA) TYPE IV  
W.S.R TO ADHAKAYASADA – A CASE REPORT**Viji P. C<sup>1</sup>, Subin V. R<sup>2</sup><sup>1,2</sup>Department of Panchakarma, VPSV Ayurveda College, Kottakkal, Kerala, IndiaCorresponding Author: [viji.pc10590@gmail.com](mailto:viji.pc10590@gmail.com)<https://doi.org/10.46607/iamj13p6022022>

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**ABSTRACT**

Spinal Muscular Atrophy (SMA) is an autosomal recessive neurodegenerative disease characterized by degeneration of alpha motor neurons in the spinal cord, atrophy of skeletal muscles, resulting in progressive proximal muscle weakness and paralysis. In Ayurveda, all genetic disorders come under *sahajavyadhi* (innate disease) having *tridoshakopa* and is *asadhya* (incurable) in nature. Presentation of the disease may vary from patient to patient. Since the goal of treatment is merely to delay the progression of the disease, treatment strategy also varies. Asymptomatic line of treatment considering the pathogenesis will be beneficial to improve the quality of life of the patient. Here a female patient of twenty-eight years with complaints of walking difficulty and weakness of lower limbs for six years was admitted in IPD (In-Patient Department) of VPSV Ayurveda College Hospital, Kottakkal. With the evidence of a molecular genetic test, she was diagnosed with SMA. The disease is diagnosed as *adhakayasada* with the aetiology of *dhatuksaya* (tissue depletion) and *beeja dushti* (hereditary). She had been given two courses of IP treatment containing both *sodhana* (eliminative) and *samana* (palliative) therapy. Progression of disease could be delayed by providing a *vatavyadhi* line of treatment succeeding with *balya* (strengthening), *brimhana* (nutritive) and *rasayana* (rejuvenative) therapy.

**Keywords:** Spinal Muscular Atrophy (SMA), Sahajavyadhi, Adhakayasada, Vatavyadhi chikitsa, Case Report

## INTRODUCTION

Spinal muscular atrophy (SMA) is a hereditary neurodegenerative disease with severity ranging from progressive infantile paralysis and premature death (type I) to limited motor neuron loss and normal life expectancy (type IV). SMA is caused by homozygous disruption of the Survival Motor Neuron 1 gene (SMN1) by deletion, conversion or mutation. The most common form of SMA is caused by a deficiency of motor neuron protein called SMN (Survival Motor Neuron).<sup>1</sup> Chromosome 5 SMA is classified into types I to IV. Approximately the degree to which motor function is affected depends on the age at which the onset of SMA symptoms occurs.

The earlier the age of onset, the greater the effect on motor function. Among the varieties of the disease, SMA type IV (Adult-onset SMA) is rare, affecting one in 300,000.<sup>2</sup> It is usually diagnosed in the second or third decade of life and has less severity than other varieties with normal life expectancy. There is no satisfactory treatment in any system of medicine because of the progressively degenerative nature of the disease. From the Ayurveda perspective, pathogene-

sis occurs due to *beejadushti* (hereditary) which is *asadhya*. All the movements of the body are controlled by *vata*. Here *mamsagatavata* occurs due to *srotorodha* (blockage of channels). *Dhatvagnimandya* in *mamsadhatu* (muscle tissue) level pave the way for *ama* formation. The resultant *srotorodha* produces atrophy in particular regions, obstruction of normal movement of *vata* and vitiate at first followed by depletion of its qualities. This complex pathogenesis may be responsible for progressive wasting, muscle weakness and results in walking difficulty.

### PATIENT INFORMATION

28 years old female, working as a Civil engineer, was admitted to IPD of VPSV Ayurveda College, Kottakkal with complaints of difficulty in walking and weakness of bilateral lower limbs for 6years with a personal history of dust allergy and undiagnosed other family history.

### CLINICAL FINDINGS

#### Nervous System

Gait – Waddling gait, Right ankle torsion and foot drop present, Muscle wasting - absent

**Table 1:**

Muscle power	Right Lower limb	Left Lower limb
Hip – Flexors, extensors	1	1
Knee – Flexors, extensors	5	5
Ankle – Flexors	5	5
Ankle extensors	1	1

**Table 2:**

REFLEXES	GRADE
Knee (right and left)	++
Ankle (right and left)	+
Biceps (right and left)	++
Babinski (right and left)	Plantar flexion

**TIMELINE**



**DIAGNOSTIC ASSESSMENT**

**सी. डी. एफ. डी. CDFD**

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**MOLECULAR GENETICS LABORATORY**

Name of the patient	Amala	Age/sex	- 23yrs/ F
Date of collection	29.12.14	Date of reporting	
Case ref no	3070/14	Ref. By	Dr Divya Pachat
Referral reason: SMA?			

**Report On Spinal muscular atrophy**

**Methodology:**  
DNA was isolated from the blood and analysed by MLPA for exons 7 and 8 in SMN1 gene.

**Interpretation:**  
The patient does not show homozygous deletion of the exons 7 and 8 in the SMN1 gene as tested by MLPA

**Counseling**

1. Spinal muscular atrophy is a degenerative disease of the motor neurons in the spinal cord, caused due to mutations in SMN gene on chromosome 5.
2. More than 90% of the cases have homozygous deletions of telomeric copy of SMN gene. The remaining 10% cases are due to point mutations.
3. The Polymerase MLPA test detects deletions of exon 7 and 8 in SMN gene. Thus a positive test report confirms the diagnosis of Spinal muscular atrophy but a negative report does NOT rule out the diagnosis.
4. Sequencing of SMN gene is required to detect the point mutations in cases where the mutation is not detected by this test.
5. Advised Genetic Counseling.

**Dr Ashwin Dalal**  
 Diagnostics Division

**Angalena R**

Note : \* Although all precautions have been taken during the test, the currently available data indicate that the chances of technical error are 2-3%.

## THERAPEUTIC INTERVENTIONS

**Table 3:** 1<sup>st</sup> course of IP treatment (2019)

Internal medications	External medications
Gandharvahastadi Kashayam 90ml – BD – Before food	Udwartanam – Kolakulattadi Churna – 8days
Dashamoolaarishtam + Balaarishtam – 30ml - BD – After food	Sadyovamana – Pippali Churna , Saindhavam, Madhu and Yashtiphanta for akantapana
Dashamoola katutravam Kashayam- 90ml – BD – Before food	Yogavasti - Matravasti - Pippalyadi anuvasana Tailam (75ml) – 2days
Chukkumtipalyadi Gulika 1-0-1 after food	Maadhutailika Vasti – 2days
Thalam – Rasnadi churnam +Jambeera swarasa - Evening	Matravasti – Sahacharadi mezhukupakam (75ml) – 3days Erاندamooladi Kashayavasti -1

**Table 4:** Discharge medicines

Medicine	Dose	Time
Ashtavargam Kashayam	90 ml	6 am (Before food)
Sahacharadi Kashayam	90ml	6 pm (Before food)
Brihatvatachintamani rasa	0-0-1	After food
Stiffain tablet	0-0-2	After food
Thalam – Valiyasahacharadi Tailam+ Rasnadi Churna	External application – 15minutes	Evening 5 pm
Lower limb exercise on sitting and lying position		1 month

**Table 5:** Follow-up medicines

Medicine	Dose	Time
Bhadradarvadi Kashaya	15ml kashaya + 60ml lukewarm water	6 am, 6 pm (before food)
Yogarajaguggulu Gulika	1-0-1	With Kashayam
Valiyasahacharadi Tailam	External application	Once in a day
Udwartana with Kolakulattadi Churna on lower limbs – self	External application	Once in a day

**Table 6:** Second course of IP treatment – 2021

Internal medicine	External medicine
Dashamoolakatutravam Kashayam – 6am- 90ml – Before food	Utsadanam - Special utsadana yoga -10days
Ashtavargam Kashayam – 6pm – 90ml – Before food	Jeevantyadi Utsadanam – 5days
Rasnadi Churna+ Jambeera Swarasam – Thalam Balaarishtam – 30ml –BD – After food	Yogavasti – Maadhutailika Vasti (2) Matravasti (5) with Sahacharadi mezhukupakam and Erاندamooladi Kashayavasti (1)

### FOLLOW UP MEDICINE - KANMADA RASAYANA

*Kanmadarasayana* is given in *avaramatra* (12gm - 1 *karsha*)

Mode of administration – Purified *Kanmada* is grounded well with ½ teaspoon honey, water and advised to take on the morning after the onset of appetite

First 4 days – 6gm of *Kanmada*

Next 13 days – 12gm

### TREATMENT OUTCOME

CPK – 343 U/L (10/11/2020 - After the first course of IP treatment)

CPK – 274 U/L (22/6/2021 – After the second course of IP treatment)

Muscle strength and reflexes remain unchanged

Reversed Hammersmith Scale (RHS) score for SMA after 2<sup>nd</sup> IP treatment is 38 and after follow up period is 39 with improvement in walking time from .625m/sec to .714 m/sec

## DISCUSSION

Clinical symptoms like weakness of lower limbs, walking difficulty can be well correlated with *adhakayasada*. The affected *doshaa* are *vyanavayu*, *apnavayu* and *dhatu* are *rasa*, *raktha*, *mamsa* and *medas*. The general line of management of *adhakayasada* was started with *udwartana*, *vasti* along *samana* medicine. Internal medicine started with *Gandharvahastadi Kashaya* for correcting *dhatwagni* by its *pachana* (digestive) and *apana vataanulomana*. *Dasamoolarishta* and *Balaarishta* are *pachana* in nature and also provide strength to the body by their *balya* nature. *Udwartana* (powder massage) with *Kolakulattadi Churna* having *rooksha* (dry) attribute was suggested by the principle of opting *langhana therapy* before *brimhana*.<sup>3</sup> During this period she had developed an acute headache and allergic problems like rhinitis and headache. To address that, and also considering the *kaphaprakruti* of patient, *sadyovamana* (emesis) was planned for purification of the upper part of the body. After those internal medicines were changed to *Dasamoolakatutraya* and *Chukumtipalyadi Gulika* for the complete removal of remaining *kaphadosha* both having *kaphavatasamana* (alleviation) and *pachana* properties. Taking into account the *vata* alleviation and site of disease manifestation on the lower part of the body, *yoga vasti* pattern was selected. *Maadhutailika vasti* acts as *rasayana* along with the elimination of *dosha*. Even though *Erandamooladi Kashayavasti* has an action on the whole body, it also pacifies *dosha* on *jangha* (calf), *uru* (thigh), *pada* (legs) and *trika* (sacral) with more *sodhana* (eliminative) properties than *Maadhutailikavasti*. *Sahacharadi mezhukupaka* mentioned in *vatavyadhichikitsa* was selected for *matravasti* (oil enema). Suggested discharge medicines were *Ashtavargam kashayam* having *kaphavatasamana*, *vatanulomana*, *deepana* (carminative) and *srotosodhana* (clear the body channels) properties. *Sa-*

*hacharadi Kashaya* narrated in *Ashtanghrudaya Vatavyadhichikitsa* has a direct action on disorders. *Brihatvatachintamani rasa* described in the book *Bhaishjyarnavali vatavyadhichikitsa* has *vatapitta samana*, *brimhana*, *balya* and *rasayana* properties. Considering the relevance of physiotherapy in this disease, muscle strengthening exercises were also suggested. After four months of treatment, she had pain in both lower limbs. *Badradarvadi Kashaya* which is *vatahara* and *brimhana* in nature and *Yogarajaguggulu Gulika* explained in *vatavyadi chikitsa* were also given along with self *udwartana* with *Kolakulattadi* powder. During the second course of IP treatment *Dashamoolakatutraya* and *Ashtavargam Kashaya* were given. Externally treated with special *utsadana yoga* mentioned in the book *Vaidyatarakam* and *Jeevanthyadi Udsadana* in *Yakshma chikitsa* both pacify *vata*, *balya* and *brimhana* group of medicines along with suitable unctuous medium. *Vastichikitsa* in *yogavasti* pattern containing *matravasti* with *Sahacharadi Mezhukupakam* and *Maadhutailikavasti*, *Erandamooladi Kashayavasti* were also given. *Rasayana* has an inevitable role in the treatment of progressive disorders. Considering innate *kapha* and *medas* aggravation in the body, *Kanmada rasayana*<sup>4</sup> was selected along with honey. *Karsha* measurement of *Kanmada* (1karsha - 12gm) is given in the morning for 17 days.

## CONCLUSION

From this case study, we can conclude that - The ayurvedic modality of treatment is helpful for better management of SMA. Diseases like SMA having genetic pathology are incurable. In such conditions providing an upgrade in QOL is also admitted as a part of treatment. Through a multi-disciplinary approach - Ayurveda as baseline therapy associated with other therapies like physiotherapy etc. would certainly do for the improvement of QOL.

## PATIENT PERSPECTIVE

During the period from confirmation of disease to five years of course, patient's condition had changed from normalcy to dependency due to the progression of the disease. According to the patient after Ayurve-

dic intervention and follow up period her condition remains unchanged which gives a clear indication of slowness of disease progression.

**INFORMED CONSENT:** The patient has given verbal consent for publishing her case details.

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