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A CASE STUDY ON AYURVEDIC MANAGEMENT OF SPINOCEREBELLAR ATAXIA

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ABSTRACT

Spinocerebellar Ataxias (SCAs) is a neurodegenerative heterogeneous group of disorders that often-characterized progressive derangement in coordination and Balance. Presently there is no definitive cure for this genetic disease. Only a few Ayurveda case studies were reported in SCA. In the present study, a case of SCA was admitted in the IPD was treated through four phases - *Deepana Pachana*, *Dosa Shodhana*, *Dosa Samana* and *Rasayana*. The duration of therapy was around two months. Treatments were aimed at understanding and avoiding the predisposing factors, reversing the pathology *(Samprapti Vighatana)* and improving the quality of *Dhatus (Rasayana)*, thereby improving the symptoms and arresting the progress of the disease. Scale for Assessment and Rating of Ataxia (SARA) score on 23/12/2020 and 19/02/2021 showed progressive improvement while discharging.

Keywords: *Vata Vyadhi*, *Avarana*, *Dhatukshaya*, Spinocerebellar ataxia, Neurodegeneration

INTRODUCTION

Ataxia is the absence of voluntary muscle coordination and loss of control of movement that affects gait, stance, eye movement, and speech. Spinocerebellar ataxia (SCA) is a rare genetically inherited progressive, neurodegenerative, and heterogeneous disease that mainly affects the cerebellum and spinal cord.[1] The global prevalence of spinocerebellar ataxia is 1 to

5 per100000. Several types of spinocerebellar ataxia are associated with anticipation, in which there is a tendency of gradual expansion of CAG repeats in a consecutive generation. CAG repeat amplification encodes glutamine. So, the aggregation of this abnormal protein in the neurons of the cerebellum and spinal cord, causing them to die. The principal cell involved in degeneration is Purkinje cells, which regulate fine movement and muscle coordination. Histopathology shows obvious loss of neurons mainly Purkinje cells in the cerebellum and other parts of CNS likely pons, spinal cord, vermis, dentate nucleus, and medulla, loss of myelin in the anterior horn of spinal cord, motor neurons of cranial nerves in the brain stem, and axonal loss. Family history is vital. Clinical manifestation and characterization are imperative before genetic analysis. Neuroimaging demonstrates the cerebellar atrophy, enlargement of ventricles, and atrophy of other parts of the brain as well. Spinocerebellar ataxia is an autosomal dominant genetic disease that has no definitive cure. Treatment is mainly symptomatic to alleviate symptoms like seizures, tremors, depression, ataxia, and eye symptoms. Ayurveda approaches the disease with symptomatologic diagnosis. The symptoms of SCA relates more to *Chala Guna Vridhi (impaired mobility)* due to deranged *Vata*; which can be involved in the spectrum of *Vata Vyadhi*. The pathology of *Vata Vyadhi* can be either *Avaranajanya* (obstructive) or Dhatu*kshayaja* (degenerative).[2] Abnormal accumulation of glut*ama*te can be correlated with *Mala Sanchaya* (accumulation of toxins) due to D*hatvagni Mandya* (metabolic dysfunction), which causes obstruction or *Avarana* to the electrical signalling, which ultimately leads to neuronal death or Dhatu *Kshaya.* Many *Rasayana* (Rejuvenative) formulations which act on the brain for *Dhatu Poshana* (tissue nourishment) are mentioned in Ayurveda. So *Rasayana* can be adopted after proper *Avaranagna* treatment.

Timeline

2020-12-23 Patient was admitted to the IPD of Kayachikitsa department of Government Ayurveda College, Thiruvananthapuram

Case History

A 41-year-old male patient came to the OPD of Kayachikitsa Department, Government Ayurveda College, Thiruvananthapuram complaining of loss of Balance while walking for 4 years and slurring of speech for 1 year.

History of Presenting Illness

Patient right-handed individual, born of non-consanguineous marriage was normal 4 years ago. He gradually developed a sensation of vertigo which was recurrent, persisting up to 2 days with a frequency of 3-4 times/ month, aggravated with postural changes and restricted him from walking; which got subsided after 6 months of Ayurveda medication. There was no associated history of earache, tinnitus, headache, vomiting or fall. He then insidiously developed imbalance while walking. gradually progressive with subsequent swaying to the left side. He also experienced difficulty in navigating through narrow spaces. There was no aggravation of symptoms during the night and closure of eyes. There was no h/o loss of consciousness, weakness, involuntary movements or fall. One year later he developed urinary incontinence which was first noticed by bedwetting and was not associated with fever, lower abdominal pain or burning sensation. After a month, he starts noticing stooping of the neck. It was not associated with pain, swelling or stiffness of the neck. So, he opted for ayurvedic treatment from SNA hospital, Thrissur, initially OP management followed by IP treatment for a month. After the treatment, urinary incontinence was relieved and his swaying while walking reduced 6 months later, he developed slurring of speech, which was gradually progressive. He was able to comprehend, read, write and speak fluently. There was no regurgitation of food or nasal twang and no preferential difficulty in uttering words like pa, ba, ma, la and ta. Meanwhile, there was progressive worsening of gait with left-sided swaying, difficulty to turn and walk with normal speed, and difficulty in climbing Up and downstairs

History

The patient had a headache at 17yrs of age which was bi-temporal, excruciating, associated with vomiting, relieved with sleep. He had head trauma at 20 yrs. of

age, which was not associated with loss of consciousness / ENT bleed.

Family History

The patient's father had Diabetes mellitus and Hypertension. His mother's elder brother had Parkinson's disease

Clinical findings

In the general examination, the patient was moderately built and nourished with a BMI of 26.1 kg/m^2. Vitals were within normal limits. Appetite was reduced with regular bowel and bladder habits. Gait was wide-based with left-sided swaying. On HMF examination, Flaccid dysarthria was present and often slurred in prolonged speech. On cranial nerve examination, III, IV and VI are affected with broken pursuit and horizontal gaze-evoked nystagmus. On motor examination, bulk, power and superficial reflexes were normal. Generalized hypotonia presents with diminished deep tendon reflexes. On cerebellar examination, finger chase test, finger nose test and heel shin test were bilaterally positive, more marked over left. Sensory examination was normal, Cardiovascular, Respiratory and Musculoskeletal examinations were normal.

Astasthana pareeksha

Nadi (pulse)- Mandam/slow (Kaphaja)

Mutra (urine) - h/o urinary incontinence (precipitancy) before 1 year

Malam (faeces) - well-formed, having regular evacuation with a frequency of 1-2 times per day *Jihwa (tongue) – Upalepatvam* (coated*)*

Sabda (sound) - Aspastam, slurred speech

Sparsam (skin) - Sita (cold)

Drik (vision) - Heena (impaired)

Akriti (built) – Madyama (moderate)

***Roga Pareeksha* (Examination of Disease)**

Nidana (Etiology)

1. *Aharaja Nidana* (Dietary causes)- *i) Rasa* (taste) – *Amla* (sour), *Lavana* (salt), *Katu* (pungent), *Madhura* (sweet), *ii) Quantity – timely intake of light meal iii) Type – Snigdha (oily) Usna (hot in potency) [prefers mango pickle, fish etc]*

2. *Viharaja Nidana* (life style related causes) – *Vegadharana* (suppression of urges), *Eka Sthana Aasanam* (sedentary life style) *and Avyayamam* (insufficient physical activity)

3. *Manasika Nidana* (psychiatric causes) - *Chintha* (thoughts) *and Krodha* (anger)

Poorvarupa – Bhrama (dizziness)

Rupam - Skhalitha Gati (Gait disturbance) *and Svara Bhramsa* (slurred speech)

Upasaya (alleviating factor) – *Sitopachara* (cold)

Anupasaya (aggravating factor) – *Usnopachara* (hot)

Samprapthi Ghataka

- *Dosa- Tridosa*
- *Dhatu- Rasa, Raktha, Mamsa Medas Asthi, Majja*
- *Srothas- Rasa, Raktha, Mamsa Medas Asthi, Majja, Mutra*
- *Srothodusti -Sangam* (obstruction), *Vimargagamanam* (moves through wrong passage)
- *Roga Margam –Madyamam*
- *Agni –Jataragni & Dhatwagni*
- *Agni Dusti* (vitiation) *–Mandagni* (reduced digestion)
- *Swabhavam* (nature) *-Chirakari* (chronic)

***Samprapthi* (Pathology)**

Due to *Snigdha Amla Lavana Katu Ahara,* and *Manda Agni, Pitta Kapha* Predominant *Dosa Dusti* occurs in *Amasaya*, which causes *Jataragni Mandhya* and further leads to the formation of *Ama*. *Ama* along with vitiated *Dosa (SamaDosa)* enters the *Rasavaha Srota*, propelled upward by *Pratiloma Vata* formed due to *Vegadharana & Ekasthanasana* reaches *Siras* (head) and due to *Khavaigunya* (defective channel) *in Siras* indicated by the previous history of S*irasoola* (headache), *Sirobhighata* (head trauma) *and Sahaja Nidana* (family history), *Sthanasamsraya* (localisation) occurs at *Siras* which causes *Avarana to Vata* especially *Vyana, Udana & Prana Vata* resulting in *Pitta Kapha Avrita Vata*. The *Avarana* causes *Vata Vriddhi* at the site of obstruction and this increased Vata causes *Masthulunga Kshayaja Vatavyadhi*

Here *Udbhavasthana* (origin) *is Amasaya* (Upper Gastrointestinal tract), *Prasarasthana* (migratory channel) *is Urdwavaha Dhamani* (ascending channels), *Siras is the Asrayasthana* (dependant area) *and Sarvasareera* (whole body) *represents the Vyakthasthana* (manifestation of disease).

Investigations

MRI on 19/09/19 showed Atrophy of medulla oblongata. Mild superior cerebellar atrophy on both sides. Hyperintensity of both middle cerebellar peduncles, medulla oblongata and; bilateral periventricular regions - s/o non-specific ischemic changes. Thinned out genu and proximal body of corpus callosum. Thinned out spinal cord in its entire length. No cord signal changes were seen. Overall features are suggestive of the Spinocerebellar ataxia spectrum.

Diagnosis

The patient was clinically and radiologically diagnosed with Spinocerebellar ataxia. Ayurveda diagnosis was made as *Masthulunga Kshayajanya Sarvangavata*, (a neurodegenerative disorder) substantiated by MRI, manifested over the whole body.

Assessment

Scale for the Assessment and Rating of Ataxia (SARA) is used for assessing the condition on the day of admission and discharge. The scale is made up of 8 items related to gait, stance, sitting, speech, finger-chase test, nose-finger test, fast alternating movements and heel-shin test.

Treatment Plan

1. As the disease having primary pathology of *Ama, Agni Mandya, Apana Pratilomata and Avarana; Deepana, Pachana and Anulomana* (reversal of Apana vata) is required as the initial phase treatment 2. Considering *Vata Vridhi,* in the second phase treatment principle for *Vata Dosa – Snehana* (Oilation), *Swedana* (fomentation) *and Mridu Sodhana* (mild purification) is adopted

3. Following *Sodhana* (Elimination) therapy, *Samana* (Pacification) procedure is adopted for removing the remaining *Dosa* 4. *Rasayana* is given in the later stage for *Dhatu Poshana*, (for improving the quality and quantity of *Dhatus*) and thus arresting the further progression of the disease.

Treatment given

1. ***Deepana Pachana Anulomana [D1 - D7]*** **(Appetizer and carminatives)**

1. *Balasairekadi Kashayam* – 90ml bd [before food]

2. *Panchakolasavam* – 30 ml bd [after food]

3. *Avipathi Churnam* – 10g Hs with warm water for 2 days

2. ***Sodhana Chikitsa [D8 - D20]***

1. Snehapana with Indukantha Ghritam for 7 days *(hriswa matra/*low dose)

2. Abhyanga Ooshma Sweda –for 3 days

3. Virechana (purgation) *with Gandharveranda Tailam* -25ml with warm water

4. Peyadi Kramam (special diet regimen)

3. ***Deepana Pachana & Snehana [D21 - D28]***

1. Panchakolasavam – 30 ml at noon, after food

2. Internal – *Rasnadasamoola Ghritam* – 5g bd

3. External – *Abhyanga* (external oilation) *with Bala-Tailam* for 7 days

4. ***Complained of Allergic*** **dermatitis** over left elbow on day 29 **[D29 - D34]** *1. Avipathi Churnam* – 15g HS with warm water

2. Pichu (padding with oil) - *Triphala Kashayam + Guloochyadi Kashayam*

3. Abhyanga – Bala Tailam changed to *Dinesha Keram*

5. ***Samana Chikitsa [D35 - D63]***

Internally

1. Balakroshani Churnam – 5g with *Balaristam*

2. Balaristam – 30ml bd

3. Guggulutiktakam Ghritam – 5g morning after food

4, Indukantham Ghritam – 5g evening after food

Externally

1. Thalapothichil with Mustha and Amalaki for 7 days

2, Takradhara for 7 days

3, Shirodhara with Karpasahastyadi Tailam for 7 days

4, Nasyam - AnuTailam 1.5 ml each nostril for 3 days *along with Thalam and Mukhabhyangam •Thalam – Rasnadi Churnam + Dhanwantharam 21 A*

•Mukhabhyangam – Bala Tailam

5, Shastika Pinda Sweda for 5 days

•Thalam – Rasnadi Churnam + Dhanwantharam 21 A

Discharge advice - Rasayana Chikitsa

1, Chyavanaprasam – 10g at bedtime

2, Balakroshani Churnam – 1 teaspoon with *Balaristam*

3, Balaristam – 30ml twice daily After food

OBSERVATION AND RESULT

SARA score showed marked improvement in Gait, Stance and Speech. Improvement is also noted in the finger chase test, finger nose test and heel shin test. Overall, SARA score changed from 17.5 to 6

Follow up

The patient was advised to visit in the OPD after one month of Rasayana therapy. His condition persisted as the same at the time of discharge with SARA score - 6. There was no progressive worsening of the disease.

Perspective

Even Though the patient approached modern medicine he didn't receive any satisfactory result, So, he came for ayurvedic management.

DISCUSSION

Spinocerebellar ataxia is a neurodegenerative disorder characterized by slowly progressive discoordination of limbs, trunks, speech and swallowing. As the main pathology is *Dhatukshaya, Rasayana Chikitsa* has an important role. As the Initial phase pathology starts with *Ama and Avarana, Deepana,* Pachana should be done as prior treatment. In *Deepana Pachana* both *Amaharatva and Avaranagna oushada* should be considered. The pathology starts with the formation of *Ama* at the level of *Kosta* along with *Apana Pratilomata* which is responsible for the *Sakha gati of Dosa*. *Panchakolasavam* is a distilled formulation developed from *Panchakola Churnam* which is mentioned as *Sreshta Pachana, Deepana and Kapha Vatahara oushada* in Sharngadhara Samhitha Madya*ma* Khanda. *Asava* formulation makes it more *Teekshna* (sharp*), Vyavayi* (diffusing) *and Vikasi* (loosening of tissues), which could be considered as an important choice for both *Kostagata and Sakhagata Deepana Pachana*. *Panchakola Churnam* is mentioned as *Pittakrit*, so for removing this side effect and for proper *Apana Anulomana, Avipathi Churnam* is used at bedtime. Here *Avarana Dosa* is *PittaKapha and Avruta Dosa is Vata*. To remove *Pitta Kapha Avarana, Balasaireyakadi Kashaya mentioned in Vatavyadhi Chikitsa of Arogyakalpadrumam*, an ancient ayurvedic text prevailing in Kerala is used. The drugs mentioned in *Balasaireyakadi are PittaKaphahara and Srotosodhana* and thus relieving the obstructed *Vata* by removing the *Avarana.*

In the second phase aggravated *Vata Dosa* which is responsible for *Dhatu Kshaya* is treated by *Dosa Sodhana* followed by S*amana therapy* for the remaining *Dosa*. As *Teekshna Sodhana* can again worsen the condition by increasing *Vata,Mridu Sodhana* which is mentioned in its treatment can be advocated.[3] *Hriswa Snehana* is done prior to *Sodhana* as the patient's *Agni* is always *Manda* in nature. *Indukantham Ghritam* is used for *Snehana as it is Deepana, Pachana and Srotosodhana* in nature and its prime indication is *Vatavyadhi.*[4] *Virechana* is given with *Gandharvahasthadi Eranda Tailam.* It's a formulation derived by combining *Gandharvahasthadi Kashaya yoga in ErandaTailam. Gandharvahasthadi Kashaya* is mentioned in *Vatavyadhi* context in *Sahasrayoga;* which is indicated for improving *Agni*, proper elimination of faeces and Vata.[5] In *Vata-Vyadhi* general treatment include repeated *Snehana* (oleation) and *Swedana* (fomentation) of the body and is the first line of treatment due to which the *Koshta* will become *Snigdha,* and the *Vata* will not get the opportunity to get lodged there permanently. After proper *Snehana* and *Swedana* if Vayu does not subside then the patient should be given elimination therapy with unctuous ingredients such as medicated ghee *(Ghruta) or Eranda Taila* with milk.[6] So *Eranda Tailam as Agrya Oushada for Virechana* is medicated with *Gandharvahasthadi Kashaya* is used for the purpose of Virechana.

The remaining *Dosa Samanatva* is required in the third phase. *Anabhisyandi (controlled moisture content), Snigdha, Srotosodhana* (channel purifier) medicines are advised in *Avarana Chikitsa* which should not aggravate *Kapha and Pitta* by alleviating *Vata.*[7] *Rasnadasamoola Ghritam* indicated in *Vatavyadhi* is given immediately after *peyadi krama,* as it contains *Aja Mamsarasa* (goat soup), *Ksheera* (milk) etc excellent *Brimhana Oushada (nourishing medicine)* indicated for UrdwaVata.[8] It was given with *Panchakolasavam* for proper *Pachanam.* Probably to the Pitta aggravating nature of *Panchakolasavam,* the patient developed allergic skin manifestation which subsided by changing the medicine. *Samana Chikitsa* continued

with *internal Snehana* with *Indukantham Ghritam*, in the morning after food and *Guggulutiktakam Ghritam* in the evening after food in *A*lpa *M*atra, as *O*utharabhakthika snehana[9] is indicated in *Urdwagata Rogas*. *Oushada Kala* (time of medicine administration) *is* specified for *Vyana- Udana Vatas*, as it is respectively involved in incoordination and speech.[10] *Guggulutiktakam Ghritam* is primarily indicated in *Prabala (powerful) Vata* along with deep seated *Dhatus* and *Jatrurdwa Gata Roga (Head and Neck diseases)*.[11] Treatment progresses with *Balakroshani Churnam with Balaristam* as an adjuvant for the site-specific action. *Balakroshani Churnam has* the ingredients *Bala, kroshani, Masha and Aswagandha, in which Kroshani is Deepana- Pachana* while others are *Brimhana and Rasayana*. Externally *Talapothichil, Takradhara, Sirodhara, Nasya and Sashtikapinda sweda* are given. *Talapothichil* is given as it is *Pitta Kapha Soshana, Dhara* procedures are helpful to bring down *Dosas* especially *Pitta*, thus removing the *Avarana*. *Nasya* with AnuTailam is helpful in eliminating the obstructed *Dosa* and in *Taila f*orm beneficial for *Tarpana. Sashtikapinda Sweda* is beneficial in alleviating *Vata Kapha* without aggravating Pitta.

Rasayana Chikitsa is the final phase and the most important treatment for *Dhatukshaya*, which arrests the further progression of the disease and improve the symptoms of the disease. *Chyavanaprasham* is selected which is *Vata Anulomana,* having site of action in the brain *(Medhya),* and improves functions both *Jnanendria* (sense organs) and *Karmeindriyas* (organs of action) like *Vak* (speech), *Pani* (upper limb), *Pada* (lower limb) etc.[12]

CONCLUSION

Spinocerebellar ataxia is a relatively rare neurodegenerative disorder that lacks proper modern medication. In Ayurveda, a wide variety of both internal and external medicines acting at the level of the Central nervous system is available, especially in degenerative disorders. Rasayana Chikitsa is given prime importance after proper *Amahara, Avaranagna and Dosahara* treatment in order to arrest the progression of the disease and for improving the symptoms of the disease

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Attachments

SARA SCALE	Before treatment	After treatment
Gait	4 - marked staggering, intermittent support of wall required	2 – clearly abnormal, tandem walking > 10 steps not possible
Stance	4 – Able to stand for > 10s in natural position only with intermittent support	2- Able to stand with feet together for > 10s, but only with swaying
Sitting	1 – slight difficulties, intermittent sway	0 – Normal, no difficulties sitting > 10s
Speech	3 – Occasional words difficult to understand	0 - Normal
Finger chase	2 – Dysmetria, under/ overshooting target < 15cm	1- Dysmetria, under/overshooting < 5 cm. Lt > Rt
Finger nose	2 – Tremor with an amplitude < 5 cm	1 – Tremor with an amplitude < 2 cm Lt> Rt
Fast alternating movement	1 – Slightly irregular (performs< 10s)	0 – normal, no irregularities (performs< 10s)
Heel shin slide	1.5- (Lt) clearly abnormal, goes off shin up to 3 times during 3 cycles , (Rt) – slightly abnormal, contact to shin maintained	0 - Normal
Total Score	18.5/40	6/40

Scale for the Assessment and Rating of Ataxia (SARA) on the day of admission and discharge.

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