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CASE STUDY

Management of Spastic paraplegia with respect to Vatavyadhi by Ayurvedic Principles - A Case Report

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ABSTRACT

Hereditary Spastic Paraplegia (HSP) is a group of inherited neurological conditions that cause the legs to become stiff and weak over time. While it isn't directly mentioned in the traditional *Ayurvedic* texts, its symptoms are similar to those of *Vatavyadhi*, a condition related to the *Vata dosha*. A case involving an 8-year-old boy presented with limping for about a year, stiffness in the right leg, and issues with controlling his bowel and bladder. From an *Ayurvedic* perspective, it was classified under *Ekangavata*, which is a type of *Vatavyadhi*. The child received two rounds of *Ayurvedic* treatment lasting 10 days each, which included procedures like *Udwarthana* followed by *Parisheka, Sarvanga Abhyanga* followed by *Nadi Sweda, Shirodhara, Anuvasana Basti, Pichu Bandhana,* physiotherapy and medicines *like Chandraprabha Vati and Rasnasaptaka Kashaya*. After these treatments, the child showed significant improvement in walking and coordination, reduced stiffness in the right leg, better control over bladder and bowel movements, and an overall better quality of life. Although HSP isn't explicitly mentioned in *Ayurvedic* literature, it can be understood and treated within the framework of *Vatavyadhi*, particularly *Ekangavata*. This case shows how *Ayurvedic* treatments, especially *Panchakarma*, combined with modern physiotherapy, can help improve neuromuscular function and quality of life in children with neurological disorders.

Key Words Hereditary Spastic Paraplegia, *Vatavyadhi, Ekangavata, Panchakarma*, Pediatric Neurology, Ayurvedic Management, *Ayurveda*

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INTRODUCTION

Hereditary Spastic Paraplegia (HSP) is a genetic neurological condition that leads to progressive stiffness and weakness in the legs, that made balance and coordination difficult. In later stages it can lead to issues related with bladder and bowel control. HSP appears in two main forms: 1. Pure HSP: This type primarily involves stiffness and weakness in the legs, often along with problems in the posterior columns of the spinal cord, leading to a loss of vibration and position sense. 2. Complex HSP: This form includes additional symptoms such as seizures, cognitive difficulties, ataxia, and peripheral neuropathy. The condition is slow progressive in nature with symptoms getting worsen with time.

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It can occur in both children and adults, but adult-onset HSP is more likely to be genetic, usually inherited in an autosomal dominant manner. HSP has a wide range of genetic causes, with over 80 subtypes and more than 60 genes linked to it. These can be autosomal dominant, autosomal recessive, or X-linked. The most common form of childhood-onset HSP is linked to mutations in the atlastin-1 gene (SPG3A) . X-linked recessive HSP is often caused by mutations in the PLP1 gene, which plays a key role in the myelin sheath of the central nervous system. Defects in the PLP1 gene interfere with myelin formation, affecting nerve signals, and this type typically presents in infancy or early childhood. Neuropathologically, HSP is marked by the degeneration of the corticospinal tracts, which are usually intact in the brainstem but begin to show atrophy in the spinal cord, indicating a "dying-back" or distal axonopathy affecting long fibers of the central nervous system[1]. From an integrative medicine perspective, especially in *Ayurveda*, HSP may fall under the term "*Pangu*"[2], which refers to weakness in the lower limbs. Treatment may include *Panchakarma* therapies, internal *rasayana* medications, and physical therapy to improve quality of life.

PATIENT INFORMATION

An 8-year-old boy visited the hospital with complaints of limping for about an year. He had previously tried treatment but saw no improvement, so he came to our hospital for further care. He had also been experiencing incontinence of bowel and bladder and stiffness in his right leg for the same duration. His past medical history was not significant. There was no history of consanguineous marriage, and no relevant family history. The child was the firstborn, and his antenatal and natal history had no major issues. Developmental milestones were achieved appropriate to age. The child experienced trauma at the age of 7, after which he started limping in the right leg. Over the next few months, he showed progressive stiffness in the same leg, along with loss of bladder and bowel control, which suggested that an upper motor neuron lesion affected the lower spinal cord or related pathways. Initially evaluated at HIMS, he was prescribed with oral medications (details not specified). Later, he was referred to Indira Gandhi Hospital, where he was diagnosed with Spinal Paraplegia and Neurogenic Bladder. The combination of unilateral leg stiffness, gait abnormality, and neurogenic bladder, especially after trauma, suggesting about a spinal cord lesion — possibly an early manifestation or trigger of Hereditary Spastic Paraplegia (HSP) or a trauma-induced spinal injury uncovering a hidden neurological condition.

CLINICAL FINDINGS

The child had a medium build, with limping on the right leg and associated incontinence of bowel and bladder. He had stiffness in the right leg. There were no abnormalities found in his vital signs or central nervous system examination. His muscle size was normal. The muscle strength was graded as 3 out of 5 in the

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hip flexors and extensors, 3 out of 5 in the knee flexors and extensors, and 2 out of 5 in the ankle flexors and extensors on the right side. There was spasticity in the lower limbs, predominantly on the right side. During assessment, his *Prakriti* (body type) was found to be *Pitta-Vataja*, and *Vikruti* (imbalance) was Vata-pradhana. He was categorized as *Twak Sara*, *Madyama Samhanana*, and *Madhyama Satva*. He belonged to the *Sadharana Desha* (common region).

TIME PLAN

After conducting a detailed history and physical examination, two sessions of *Panchakarma* treatments were scheduled, each spaced 30 days apart. These procedures were planned for a period of 10 days. The *Panchakarma* treatments are listed in Table 1 and *Shamana Aushadha* (balancing medicines) were also prescribed alongside these procedures and upon discharge that are explained in Table 2.

Table 1 *Panchakarma* procedures

SL NO.	Procedures	Drugs used	Duration
1.	*Udwarthana*	*Udwarthana choorna*	5 days
2.	*Parisheka*	*DMQ*	5 days
3.	*Sarvanga abhyanga*	*Ksheerabala Taila*	5 days
4.	*Nadi sweda*	*Vatahara patras*	5 days
5.	*Shirodhara*	*DMQ+musta+amalaka*	10 days
6.	*Anuvasana Basti*	*dhanwantara taila*- 15ml	10 days
7.	*Pichu Bandhana* to B/L Lower Limbs with splint	*Ksheerabala taila*	8 days

Table 2 *Shamana aushadha*

SL NO.	***Shamana aushadha***	**Dose and frequency**	***Anupana***
1.	*Chandraprabha vati*	1 tablet twice a day	water
2.	*Rasnasaptaka Kashaya*	5ml with 10ml water twice a day.	lukewarm water

Diagnostic Assessment

Sroto pareeksha *: Rasavaha, Raktavaha, Mamsavaha, Asthivaha Majjavaha*

Symptoms: Limping of right leg, associated with bowel and bladder incontinency, Stiffness of right leg.

OBSERVATION AND RESULTS

The child had two treatment sessions. After the first session, there was a decrease in stiffness in the right leg, early signs of better motor function, and more comfort during movement. After the second session, there was a clear decrease in stiffness in both lower limbs, and there was improved walking, although it was still limited. The child also started to have some control over bowel and bladder functions. Muscle strength in the lower limbs improved from a rating of 3 out of 5 to 4 out of 5 (using the Medical Research Council [MRC] scale). Ankle movements improved from a rating of 2 out of 5 to 3 out of 5.

DISCUSSION

HSP is diagnosed through genetic testing to find specific gene mutations, like spastin or alastin. However, due to financial issues, genetic testing and other required tests were not done in this case. There is no treatment to atop progress of

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disease. Instead, the main approach is regular physical therapy to help maintain or improve movement, strengthen muscles, and improve coordination and balance. Occupational therapy helps with daily activities and teaches techniques to increase independence and improve quality of life. Although HSP isn't directly mentioned in *Ayurvedic* texts, it can be considered part of *Vata vyadhi.* The *Kukundara Marma* point is located on either side of the spine near the lower back, where nerves from L4 to S3 pass through the buttock muscles[3]. Detrusor muscle overactivity happens when there is an imbalance between the systems that control muscle activity, and sacral neuromodulation helps restore that balance[4]. Stimulation of the sacral afferent nerves increases signals that reduce bladder muscle contractions[5]. Stimulation of the tibial nerve through the L4-S3 nerve roots helps regulate urinary function by reducing sensory input from the bladder[6]. Based on the symptoms, this condition might be linked to *Pangu,* which involves *Beejadosha* and an imbalance between *Vata, Kapha,* and *Pitta,* leading to a customized treatment plan. Table 1-1, which is a dry powder massage, improves circulation, reduces fat blockage, and strengthens muscles. Table 1 - 2 is said to reduce stiffness and increase blood flow. *Acharya Dalhana* describes how *Sneha* is absorbed during the *Abhyanga* procedure[7]. Table 1 - 3 nourishes muscles and calms *Vata.* Table 1 - 5 which involves slowly pouring medicated warm oil or liquid on the forehead, may affect neurotransmitters, especially serotonin, which influences brain pathways related to urination[8]. *Shirodhara* helps regulate serotonin and noradrenaline, which is important for brain functions[9]. *Basti* therapy is a powerful treatment for *Vata Vyadhi*[10]. Table 1 - 6 with *Dhanwantara Taila* helps with muscle weakness and balances *Vata*. Table 1 - 7 supports muscle health and reduces stiffness. Along with these Table 1, physiotherapy was suggested to build muscle strength. Table 2 - 1 is made from ingredients like *Karpura, Vacha, Musta, Bhunimba, Guduchi, and Devadaru,* helps with bladder control[11]. Table 2 - 2 contains *Rasna, Amrita, Aragwadha, Devadaru, Trikantaka, Eranda,* and *Punarnava,* helps reduce stiffness[12]. After two treatment sessions, with 30 days apart, the child showed significant improvement in walking, which made the family very happy. Using *Shamana Aushadha* boosted the effectiveness of the *Panchakarma* treatments, showing *Ayurveda's* holistic approach to treating symptoms of *Vatavyadhi.*

CONCLUSION

HSP is a group of genetic disorders caused by changes in different genes, including spastin and alastin.It is linked to *Vatavyadhi* in *Ayurveda* and can be challenging to treat. Treatment is tailored to each patient based on their specific symptoms. The treatment is planned considering the involvement of *Doshas,* disease, and *bala.* Managing HSP focuses on controlling symptoms and improving the patient's quality of life.

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Studies need to be conducted to form a standard protocol for HSP.

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