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Integrated Ayurvedic and Physiotherapy Intervention in a Child with Spastic Cerebral Palsy: A Single Case Study

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Abstract

Spastic cerebral palsy is a non-progressive condition that impacts movement and posture due to early brain injury, causing considerable motor and developmental challenges. It has a high prevalence rate of 2-3 per 1000 children. Among the different types, spastic cerebral palsy is the most prevalent, affecting approximately 61% of all individuals with cerebral palsy**.**This case involves a 2.5-year-old male child who demonstrates global developmental delay, hasnot achieved neck holding,sitting, standing, or walking independently, and has not achieved meaningful speech since birth. The child has a notable perinatal history that includes birth asphyxia, neonatal seizures, sepsis, and a prolonged stay in the NICU. A neurological evaluation revealed spasticity in all four limbs, hypertonia, restricted range of motion, and a positive Babinski reflex, confirming the diagnosis of spastic cerebral palsy. Ayurveda links this condition to Janma Bala Pravritta Vyadhi or Shiro Marmabhighata Vata Vyadhi. A comprehensive Ayurvedic Panchakarma therapy, such as Udavartana, Sarvanga Abhyanga, Nadi Swedana, Matrabasti, Upanaha, Shirotalam, Nasya, along with internal Medhya–Balya medications and physiotherapy. The post-treatment assessment indicated notable enhancements inoverall development. This case highlights the effectiveness of integrative Ayurvedic management in improving functional outcomes for children diagnosed with spastic

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cerebral palsy.

Key words : Spastic Cerebral Palsy, Janma Bala Pravritta Vyadhi, Shiro Marmabhighata Vata Vyadhi, Panchakarma Therapy, Ayurveda, Pediatric Neurodevelopment.

Cerebral palsy (CP) refers to a collection of permanent disorders affecting the development of movement and posture, leading to activity limitations. These disorders are linked to non-progressive disturbances that occur in the developing brain of a fetus or infant. The motor impairments associated with cerebral palsy are frequently accompanied by issues related to sensation, perception, cognition, communication, and behaviour, as well as epilepsy and secondary muscul-oskeletal complications.[1,12] In India, the incidence of cerebral palsy is 3 per 1000 live births, with 77.4% of affected children diagnosed with the spastic type of cerebral palsy.[4] Spasticity is characterized by exaggerated tendon reflexes (hyperreflexia) and an increased muscle response to applied stretch, which is positively correlated with the rate of length-ening (velocity-dependent hypertonia).[5] Cerebral palsy does not correlate with any single conditiondescribed in Ayurveda, as it is a multifactorial disorder. However, based on the classification and specific features of its types, cerebral palsy can be viewed as *Janma Bala Pravritta Vyadhi* (a congenital disorder). It may also arise from imbalances in Doshas (bodily humours) and can be classified as Shiro Marmabhighata

Vata Vyadhi (conditions resulting from head injuries).[1,14,15] The therapeutic approach is based on the understanding that it is Vata Pradhana, with Snehana, Swedana, combined with Alternate Rukshana, Nasya and Basti being the primary treatment methods.The primary emphasis is on managing spastic cerebral palsy through the application of specific Ayurvedic internal and external treatment methods.

Aim and objective :

This study focused on the management of spastic cerebral palsy by utilizing targeted ayurvedic treatments, both internal and external, in conjunction with physiotherapy. This method seeks to improve multiple elements, such as gross motor skills, muscle strength, tone, flexibility, and posture and reduce spasticity.

This single clinical case study was conducted in the Kaumarbhritya OPD & IPD of Khemdas Hospital on a 2.5 year-old male child diagnosed with spastic cerebral palsy. Detailed history taking, physical and neurological examination, and developmental history assessment were carried out. The intervention comprised an integrated Ayurvedic management protocol including Panchakarma procedures, internal medications, and concurrent physiotherapy. Clinical outcomes were assessed based on changes in gross motor skills, muscle strength and tone, and spasticity during follow-up.

Patient's Perspective:

A 2.5-year-old male child was brought to the Kaumarbhritya OPD of Khemdas Hospital with complaints of inability to hold the neck, inability to sit and stand with or without support

since birth, inability to walk with or without support since birth and unable to speak since birth. As per parents, the condition has been gradual and non-progressive in nature, with no history of regression of attained milestones.

Birth and neonatal history :

The case history reveals that he is first baby of non- consanguineous parents and was born at 37 weeks of gestation through normal vaginal delivery, weighing 2950 grams, and had a history of birth asphyxia. The neonatal period was characterized by issues including seizures, hyperbilirubinemia, neonatal sepsis, and a prolonged NICU admission lasting 15 days. These perinatal difficulties are acknowledged risk factors for cerebral palsy, resulting from hypoxic-ischemic brain injury during early development.

Family history:

There is no relevant history in the family

Immunization history :

The child received all vaccinations as per the IAP immunization schedule.

Developmental history :

The child exhibited a global developmental delay, showing considerable delays in gross motor, fine motor, language, and social milestones. At the age of 2.5 years, the child could not hold the neck and could not sit, stand, or walk independently and had not achieved meaningful speech when compared to age-appropriate standards, suggesting a widespread pattern of developmental delay as indicated in the table-1 below.

Table-1. Gross motor, Fine motor, language and social mile stones achievement

Gross motor milestones	**Achieved at**	**Normal age**
Neck holding	2.6 years	3 months
Rolls over	2.6 years	5 months
Sit without support	2.7 years	8 month
Stand with suppot	2.7 years	9 months
Fine motor	**Achieved at**	**Normal age**
Bidextrous reach	15 months	3 months
Unidextrous reach	18 months	6 months
Palmer grasp	2.6 years	6 months
Immature pincer grasp	2.7 years	9 months
Mature pincer grasp	Not achieved	12 months
Language milestones	**Achieved at**	**Normal age**
Laugh loudly	18 months	4 months
Monosyllabus	2.7 years	6 months
Bisyllabus	Not achieved	9 months
1-2 words with meaning	Not achieved	12 months

Social milestones	Achieved at	Normal age
Social smile	6 months	2 months
Recognise mother	10 months	3 months
Recognise stranger and stranger anxiety	18 months	6 months
Waves bye bye	24 months	9 months
Play simple ball games	26 months	12 months

Clinical Findings :

General examination :

On general examination, the child was conscious, alert and co-operative on and off with stranger anxiety with stable vitals, having moderate build and nourishment, with no pallor, icterus, cyanosis, clubbing, oedema or lymphadenopathy; tongue was uncoated. Anthropometric measurements revealed height, weight, and head circumference are not appropriate for age, with mild deviation suggestive of developmental delay. Appetite was moderate, bowel and bladder habits were satisfactory, and sleep pattern consisted of 6–8 hours at night with daytime sleep of around 2 hours.

Systemic Examination:

Systemic examination showed a symmetrical chest with a centrally placed trachea and equal bilateral air entry on auscultation, with no added sounds. Cardiovascular system examination revealed normal heart sounds with a palpable apex beat and no murmurs. Abdominal examination was unremarkable, with a soft, non-distended abdomen and normal bowel sounds.

On central nervous system examination, the child was conscious and alert with appropriate awareness of surroundings for age. Higher mental functions revealed not oriented to time, place and person with no speech. Cranial nerve examination (I–XII) showed no abnormality, with all cranial nerves intact with no ptosis and nystagmus. Sensory examination demonstrated intact sensations to touch, pain, temperature, and vibration. Motor system examination revealed moderate muscle bulk with atrophy, no hypertrophy and pseudohypertrophy. Muscle tone was increased in both upper and lower limbs, suggestive of spasticity. Deep tendon reflexes were exaggerated in both upper and lower limbs. Superficial reflex examination revealed an extensor plantar response (Babinski positive). No involuntary movements were observed.

On locomotory examination, inspection revealed the child's gait could not be evaluated as child is unable to stand or walk . The posture indicated scissoring of the lower limbs when support was provided. The spine exhibited normal physiological curvatures. The lower limbs remained in a scissoring position, while the upper limbs displayed no apparent deformities. Palpation revealed no tenderness, redness, or crepitus. Muscle tone assessment indicated hypertonia in both the upper and lower limbs, which suggests spasticity. The clasp-knife phenomenon was observed. Range of motion was limited, mainly due to spasticity and related contractures.

Time line :

Table-2. Timeline of Symptoms, Intervention

Date/ Age	Events	Key findings/Intervention
Since infancy	Onset of symptoms	Delayed attainment of gross motor mile stones
At 2.5 years	Symptoms	Child is unable to hold neck, sit,stand, or walk with or without support and unable to speak. No history of regression of milestones,seizures, or acute neurological deterioration.
26/10/2025	First hospital visit and admission to kaumara-bhrityaIPD (1st sitting)	Detailed clinical evaluation revealed spasticity in upper and lower limbs, and exaggerated reflexes;a diagnosis of spastic cerebral palsy.
26/10/2025 to 5/11/2025	To hospital stay (1st sitting)	Intiation of Panchkarma procedures along with oral balya- medhya medications and physiotherapy.
3/12/2025	Second admission (2nd sitting)	Parents reported mild improvement in gross motor milestones such as neck holding and muscle tone; reassessment showed improvement in gross motor milestones and slight improvement on muscle tone
3/12/2026 to 19/12/2026	To hospital stay (2nd sitting)	Repeat Panchakarma procedures continued with emphasis on Vata shamana, dhatu poshana, and gait training through physiotherapy.
19/12/2025	Discharge	Advised continuation of oral medications, and home-based care.

Diagnosis:

The child exhibited an inability to support the neck, sit, stand, or walk, both with and without assistance, since birth, and also showed a lack of speech. A neurological assessment indicated spasticity in all four limbs, heightened deep tendon reflexes, an extensor plantar response, a scissoring posture in the lower limbs, a clasp-knife phenomenon, and a limited range of motion due to contractures, all following a generally non-progressive course based on clinical evaluation, neurological examination, and developmental assessment, the child was diagnosed with **spastic cerebral palsy**.

From an Ayurvedic perspective, the condition was considered as **Janma Bala Pravritta Vyadhi /Shiro Marmabhighata**

Vata Vyadhi due to vitiation of Vata dosha affecting neuro-muscular development. Vatavyadhi (disorders of vata) is caused by trauma to the Mastishkagata majja or brain. They have symptoms and indicators that are comparable to cerebral palsy. Due to the causative factors in the antenatal, natal, and post-natal period the vata predominant tridoshas (body humors) gets vitiated in the mastishka gata majja. The tridoshas also vitiate the pranavaha srotas(respiratory system), afflicting the karmendriya and jnanendriyas. Due to this the child cannot achieve the gross motor and fine motor mile stones, leading to CP. In spastic CP, there is association of ama with vata dosha (the energy of lubrication).This causes sthambha(stiffness) and gaurava (heaviness)in the extremities and reduces the motor functions.[11]

Therapeutic interventions:

The therapeutic approach was planned with the objectives of Vata shamana, dhatu poshana, and improvement of neuromuscular coordination. A combination of Panchakarma procedures, oral Balya–Medhya formulations, and physiotherapy was administered in sittings, which is mentioned in Table-3. The interventions aimed to reduce lower limb spasticity, enhance muscle tone, and support overall developmental progress in the child.

Follow-up and Outcome :

On follow-up assessment, the child showed gradual and consistent improvement in motor functions and muscle tone. Assessment showed noticeable reduction in spasticity, improvement in muscle tone, better head and trunk control, ability to sit with support, enhanced neuromuscular coordination, and gradual progression in gross motor abilities.

Although CP is a non-progressive disorder, It is better to start multiple interventions to combat with CP at the earliest. Ayurveda has jewels of many good herbs, Panchkarma procedures and yoga which can better manage CP and associated conditions.[6] These make a micro-environment for neuronal plasticity by neuro-regenerative, neuroprotective, and nootropic properties of herbs like Bala, Brahmi, Dashamoola allowing Vata Dosha to perform its normal function.[3] These properties are essential to treat CP especially with spasticity, poor cognitive function, behavioral problems, and mental retardation and seizure disorders. The comprehensive therapeutic strategy that integrates Panchakarma techniques (Udwartana, Abhyanga, Swedana, Upanaha, Basti, Shirotalam) with internal Balya–Medhya treatments and organized physiotherapy was designed to alleviate Vata prakopa, improve tissue nourishment (dhatu poshana), and restore functional mobility.[1]

Panchakarma methods such as Udwartana along with Abhyanga is followed as per concept of Vyatyasachikitsa when both vata and kapha are involved the treatment followed should not aggravate either vata or kapha[2], since both are having the opposite qualities except Sheethaguna (cold in potency) the udwartana will help in reduction of kapha[17] and Abhyanga will help in reduction of vata by utilizing medicated oils such as Mahanarayana Taila, offers systemic external oleation (Sneha) and Vata-pacifying benefits, potentially alleviating muscle stiffness and enhancing circulation in neuromuscular disorders. It

Table-3. Timeline of treatment and improvements

Date	Intervention	Improvements observed
26/10/2025 to 3/11/2025	Udwartana with udwartana churna f/b nadisweda for 2 day Sarvanga abhyanga with mahanarayana taila f/b nadiswedaMatrabasti with mahanarayana taila (15 ml) Upanaha with bala+godhum UL, LL, and Kati Shirotalam with Rasnadi Choorna +brahmi churna+ tila taila Pratimarsha nasya with anu taila 2/2 Ashwagandha vati 0-0-1 A/FSyp. Shankhapushpi 5ml A/F (morning) Physiotherapy	Neck holding attained Rolls over achieved Palmer grasp achieved
3/11/2025 to 2/12/2025	Ashwagandha vati 0-0-1 A/F Syp Shankhapushpi 5ml A/F (morning)	
3/12/2025 to 9/12/2025	Udwartana with udwartana churna f/b nadisweda for 2 day Sarvanga abhyanga with mahanarayana taila f/b nadisweda Matrabasti with mahanarayana taila (15 ml) Upanaha with bala+godhum UL, LL, and Kati Shirotalam with Rasnadi Choorna +brahmi churna+ tila taila Pratimarsha nasya with anu taila 2/2 Ashwagandha vati 0-0-1 A/F Syp. Shankhpushpi 5ml A/F (morning) Physiotherapy	Baby able to sit with support achieved Standing with support achieved Immature pincer grasp achieved Monosyllable achieved
9/12/2025 to 9/01/2026	Ashwagandha vati 0-0-1 A/F Syp Shankhapushpi 5ml A/F (morning)	

nourishes the Asthi, Mamsa, and Majja dhatus while supporting the srotos (microchannels). Additionally, the following Nadi Sweda (herbal steam) promotes local blood circulation and relaxation of deep tissues. Clinical studies on Panchakarma related to motor disabilities (for instance, in cerebral palsy) that combine Abhyanga and Swedana have demonstrated a notable decrease in spasticity and an enhancement in joint mobility.[7]

Matra Basti is a gentle medicated oil enema designed for the pacification of Vata and the nourishment of Asthi, Mamsa, and Majja. A small-dose oil basti aids in enhancing neuromuscular coordination and alleviates Vata prakopa in chronic conditions. According to Panchakarma literature and clinical studies, basti therapies, particularly those utilizing Balya oils such as Mahanarayana Taila, have the potential to enhance muscle bulk, tone, and developmental results in spastic or motor disorders.[16]

Upanaha, a herbal warm poultice, combined with Bala and Godhum (a heat-generating medicated bolus), provides targeted warmth and herbal benefits to muscles and joints. This age-old treatment improves local blood flow, alleviates muscle tension, and aids in reducing Vata-related muscle stiffness through the deeper absorption of heat and medicine via the skin. While there is a scarcity of specific controlled trials, comparative research on the combination of

Upanaha in spastic conditions shows measurable reductions in muscle tone when used alongside Abhyanga and Sweda[16,17]

Shirotalam is a procedure where medicaments are mixed with taila and applied over the region of anterior fontanalae, since the drugs selected are Medhya (improves cognitive functions) in nature along with rasanadi choorna it helps in improving the functions of Uttamanga (brain) of the child.[16] Pratimarsha nasya with Anu Taila may improve the process of oxygenation, which has a direct influence on the functions of brain . Also, Anu taila is Vataghna and Brumhana in nature[17]. Ashwagandha is well-known in both traditional Ayurveda and contemporary scientific research for its adaptogenic, neuromodulatory, anti-stress, and neuroprotective characteristics. It has been traditionally categorized as a Balya and Medhya Rasayana, promoting physical strength, cognitive abilities, and stress resilience, which is particularly advantageous in chronic neuro developmental disorders.[9] Syp. Shankhpushpi acts as Medhya Rasayana supports cognitive functions, attention, and learning helps to reduce irritability supports overall neurodevelopment and functional improvement.[13]

Physiotherapy provides evidence-based neuromuscular rehabilitation focusing on improving muscle strength, flexibility, balance, and gait. In pediatric spastic and developmental disorders, guided physiotherapy optimizes functional mobility and complements traditional therapies, contributing to improved motor mile stones and independent ambulation.[10] Evidence shows that integrated therapeutic programs combining manual therapy, stretching, and strength training improve motor function in conditions like cerebral palsy and developmental delay.[8]

Spastic cerebral palsy is caused by early brain damage, which leads to ongoing

motor difficulties and developmental delays. In this instance, a combination of integrative Ayurvedic Panchakarma therapies and physiotherapy contributed to a reduction in spasticity, an improvement in muscle tone, and an enhancement of neuromuscular coordination, ultimately promoting functional and developmental progress. Elimination of Vata prakopa is the first line of treatment in Ayurveda for spastic cerebral palsy and for this appropriate panchkarma therapy along with physiotherapy were adopted. A good prognosis and improvement were observed, especially gross motor milestone like proper neck holding, rolls over, sitting with support and standing with support and fine motor milestones like palmer grasp, immature pincer grasp and in language monosyllable mile stones was able to achieved after treatment. This case illustrates that a combined Ayurvedic and physiotherapy approach can lead to significant enhancements in motor function and overall development for children with spastic cerebral palsy. Timely intervention and personalized integrative management may enhance functional results and improve quality of life.

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