Research Article

www.ijrap.net

(ISSN Online:2229–3566, ISSN Print:2277–4343)

INTEGRATIVE AYURVEDIC MANAGEMENT OF SPASTIC DIPLEGIA IN A CHILD WITH PERIVENTRICULAR LEUKOMALACIA

Anagha Narayanan *

Assistant Professor, Department of Kaumarabhrithya, Krishna Ayurved Medical College, Vadodara, Gujarat, India

Received on: 10/7/25 Accepted on: 12/9/25

***Corresponding author**
E-mail: anunavarang4@gmail.com

DOI: 10.7897/2277-4343.165171

ABSTRACT

Spastic diplegia is a common form of cerebral palsy often seen in preterm infants and is frequently associated with periventricular leukomalacia (PVL). This case report presents the Ayurvedic management of a 3-year-old male child diagnosed with spastic diplegia due to PVL. The child was born at 7 months of gestation with a birth weight of 1 kg and had a history of delayed motor milestones, increased tone in the lower limbs, and exaggerated reflexes. The primary complaints were difficulty in walking and poor lower limb control. In this case, Panchakarma therapies such as Udwartana, Patra Pinda Sweda, Shashtika Shali Pinda Sweda, Shiropichu, and Matra Basti were administered along with internal medicines like Vacha, Guduchi, Brahmi, and Saraswatharishta with gold. These interventions were combined with physiotherapy including the use of physiotherapy shoes and cycling exercises. Pre- and post-treatment assessments using the Modified Ashworth Scale (MAS), muscle power evaluation, and motor development milestones showed notable improvement in spasticity, muscle strength, and mobility. The child was able to walk with wall support and perform cycling activities effectively. This case demonstrates that integrative Ayurvedic approaches can complement conventional therapies in managing neuromuscular disorders such as spastic diplegia. The correlation between classical Ayurvedic interventions and modern physiotherapy outcomes suggests potential for broader application. Early and holistic management may lead to improved functional independence and better quality of life in children with similar neurological conditions.

Keywords: Spastic diplegia, periventricular leukomalacia, cerebral palsy, neurorehabilitation

INTRODUCTION

Cerebral palsy (CP) is a non-progressive neurological disorder affecting movement and posture due to brain injury during the prenatal, perinatal, or early postnatal period[1]. Spastic diplegia, a subtype of CP, primarily affects the lower limbs, leading to muscle stiffness, exaggerated reflexes, and motor delays[2]. Periventricular leukomalacia (PVL) is a significant risk factor for spastic diplegia, commonly seen in preterm infants due to hypoxic-ischemic injury affecting white matter[3].

Conventional management of spastic diplegia includes physiotherapy, occupational therapy, orthotic support, and medications (such as muscle relaxants and botulinum toxin injections)[4]. However, Ayurveda provides an alternative holistic approach focusing on nourishing the nervous system, balancing Vata Dosha, and improving muscle function through therapies like Panchakarma, herbal medications, and dietary modifications[5].

This case study presents the Ayurvedic management of a 3-year-old child diagnosed with spastic diplegia due to PVL, aiming to assess the effectiveness of Ayurvedic interventions in improving motor function, reducing spasticity, and enhancing quality of life[6].

AIM

To evaluate the efficacy of an integrative Ayurvedic management approach, including Panchakarma therapies and internal medications, in improving motor function, reducing spasticity, and enhancing the quality of life in a child with spastic diplegia due to periventricular leukomalacia (PVL).

OBJECTIVES

To assess the impact of Ayurvedic Panchakarma therapies and internal medications on muscle tone, spasticity, and motor function in a child with spastic diplegia[7].

To determine the effectiveness of an integrative approach (Ayurveda + physiotherapy) in enhancing mobility and functional independence[8].

To compare pre- and post-treatment outcomes using standardized assessment tools like the Modified Ashworth Scale (MAS) and muscle power grading[9].

METHODOLOGY

Consent: The present study was conducted under ethical principles following the International Conference of Harmonization – Good Clinical Practice (ICH- GCP)[10]. To fulfil the aim and objectives of the study, this work was carried out in the following phase-wise manner

Study Design

A single case study was conducted on a 3-year-old male child diagnosed with spastic diplegia due to PVL, undergoing Ayurvedic treatment at Matrusri Davalba Ayurved Hospital[11].

Assessment Tools

1. Modified Ashworth Scale (MAS) – to measure spasticity.
2. Muscle Power Grading – to evaluate strength improvement.
3. Motor Function Analysis – pre- and post-treatment assessment of ambulation and movement abilities.

Outcome Measures
- Reduction in muscle spasticity (MAS score improvement)
- Enhancement in muscle strength (improved power grading).
- Functional improvement in mobility and gait.

Duration of Study
- Total duration: 24 days
- Follow-up: After 1 month

Case Presentation

Patient Details
- **Age:** 3 years
- **Sex:** Male
- **Address:** Jambhuva

Chief Complaints
- Unable to walk without support since appropriate age
- Stiffness in lower limbs

History of Presenting Illness
A 3-year-old boy was brought to the Outpatient Department (OPD) of Matrusri Davalba Hospital, Varnama, Vadodara, Gujarat by his parents, concerned about his inability to walk without support. The child was born to a non-consanguineous couple as a preterm baby (7 months gestation) with a birth weight of 1 kg and was admitted to the NICU for 25 days due to low birth weight (LBW). At the age of 2 years, his parents noticed a delay in independent walking and consulted a pediatrician. An MRI brain scan revealed periventricular leukomalacia, following which physiotherapy was initiated, leading to some functional improvement in gait. However, independent ambulation was not achieved, prompting the parents to seek further Ayurvedic treatment.

History of Past Illness
- Preterm Birth: The child was born prematurely at 7 months of gestation.
- Low Birth Weight (LBW): Birth weight recorded as 1 kg, requiring NICU admission for 25 days.
- Delayed Motor Milestones: Parents observed delayed independent walking by the age of 2 years.
- Neurological Concerns: Increased muscle tone, exaggerated reflexes, and difficulty in movement were noticed.
- MRI Findings: At the age of 2 years, an MRI brain scan revealed periventricular leukomalacia (PVL), confirming the underlying cause of spastic diplegia.
- Physiotherapy Intervention: Initial physiotherapy was started following diagnosis, leading to some improvement in motor function but inability to walk independently persisted.

Drug History
- Butanoic acid: Prescribed as a muscle relaxant to reduce spasticity.
- Cal D3 (Calcium + Vitamin D3): Given for bone health and neuromuscular support.
- (Amoxicillin + Clavulanic Acid): Administered for infections.

Family History
- Mother had pre-eclampsia at 7 months of gestation

Birth History
- **Antenatal:** Maternal morbidity due to pre-eclampsia
- **Natal:** Preterm baby born via LSCS, no history of seizures, jaundice, or asphyxia
- **Postnatal:** Birth weight of 1 kg, NICU stay for LBW

Clinical Examination
- **Vital Signs:** Normal
- **Neurological Assessment**
  - Conscious and well-oriented
  - Normal speech
  - Increased muscle tone (more in lower limbs than upper limbs)
  - Muscle power: Grade 3 (G3) in lower limbs, Grade 4 (G4) in upper limbs
  - Exaggerated deep tendon reflexes in all limbs

Investigations (23/05/2024)
MRI brain: Abnormal T2/FLAIR white matter hyperintensities in periventricular location and centrum semi ovale, suggestive of Grade I periventricular leukomalacia

Table 1: Treatment plan

Panchakarma treatment given	Medicine	No of days
Udwartana(Powder Massage)	Triphala churna	3
PPS (Patra Pinda Sweda)	Kheerabala taila	7
SSPS (Shashtika Shali Pinda Sweda)	Dasamula Ksheera Kashaya	14
Matra Basti (Oil Enema)	Shaishuka sneha	14
Shiropichu (Sterile cotton dipped in medicated oil placed on the crown)	Vacha Churna + Yashtimadhu Churna + Guduchi Churna with Kheerabala taila	24

Table 2: Internal medicine, dose and anupana

Internal medicine	Dose	Anupana
Vacha Churna + Yashtimadhu Churna + Guduchi Churna + Sitopaladi Churna	1gm each BD	Honey
Saraswatharishta with Gold	5ml BD	
Brahmi Vati	1 BD	Honey + Ghee
Overnight soaked raisins	5-6 on Empty stomach	

RESULTS AND DISCUSSION

The integrative Ayurvedic treatment, including Panchakarma therapies and internal medications, showed notable improvements in the child's motor function, spasticity, and overall quality of life. The outcome was assessed using the Modified Ashworth Scale (MAS), muscle power grading, and functional mobility tests before and after treatment. Spastic diplegia associated with periventricular leukomalacia is a form of cerebral palsy commonly seen in preterm infants due to ischemic injury to the white matter. Ayurveda considers this condition as a Vata Vyadhi, with predominant involvement of Majja Dhatu (nervous system) and Mamsa Dhatu (muscular system).

The Panchakarma therapies used in this case, such as Udwartana, Shashtika Shali Pinda Sweda (SSPS), Shiropichu, and Basti, focus on pacifying Vata Dosha, nourishing Dhatus, and improving neuromuscular coordination.

Role of Panchakarma Therapies

Udwartana (Herbal Powder Massage) reduces spasticity and improves circulation. Patra Pinda Sweda (PPS) enhances flexibility and relieves muscle stiffness. Shashtika Shali Pinda Sweda (SSPS) nourishes the muscles and enhances motor coordination. Matra Basti (Oil Enema) with Shaishuka Sneha helps pacify Vata Dosha. Shiropichu helps in deep penetration of the oil through the scalp, enhancing neuronal function.

Before treatment

After treatment

Table 3: Parameters before and after treatment

Parameter	Before Treatment	After Treatment
MAS (Modified Ashworth Scale)	3+ (increased tone in lower limbs)	2 (reduced spasticity)
Muscle Power	G3 (lower limbs), G4 (upper limbs)	G4 (lower limbs), G4+ (upper limbs)
Motor Development	Unable to walk independently, stiffness in gait	Able to walk with wall support, able to walk independently for 1 minute, able to do cycling with specialized orthopedic shoes

Effect of Internal Medications

Brahmi Vati and Saraswatharishta (with Gold): Known for their neuroprotective effects, these formulations improve cognitive function, memory, and motor control[12].

Guduchi Churna and Vacha Churna: Guduchi has anti-inflammatory and immunomodulatory properties, supporting neuronal repair. Vacha enhances nerve conduction and muscle relaxation, helping in spastic conditions[13].

Sitopaladi Churna and Yashtimadhu: Improve metabolic functions and support overall strength and development[14].

Raisins (soaked overnight): Aids digestion and prevents Ama (toxins) accumulation, which can worsen neuromuscular conditions[15].

Clinical Significance

The integrative approach of Panchakarma, internal medications, and dietary modifications helped in gradual improvement in muscle tone, gait, and overall functional abilities.

Matra Basti played a crucial role in managing Vata, which aligns with the classical Ayurvedic approach to neurodevelopmental disorders[16].

Herbal formulations like Saraswatharishta and Brahmi Vati aided in cognitive development and motor skills enhancement.

CONCLUSION

The integrative Ayurvedic approach, including Panchakarma therapies and internal medications, significantly improved spasticity, muscle strength, and functional mobility in this case of spastic diplegia due to PVL. Ayurveda, when combined with physiotherapy, can be a promising complementary approach for managing neuromuscular disorders like cerebral palsy. However, further clinical studies with larger sample sizes are required to validate these findings.

REFERENCES

1. Sarnam KR. Cerebral Palsy – Etiopathogenesis and Management, Pediatric Neurology, 3rd ed., New Delhi, Jaypee Brothers Medical Publishers, 2018, p 145–158.
2. Tripathi IP. Periventricular Leukomalacia in Preterm Infants, Indian Journal of Child Neurology, 2020;7(2):54–60.
3. Sharma RK, Dash B. Charaka Samhita, Chikitsa Sthana, Vol. 2, 11th ed., Varanasi, Chaukhambha Sanskrit Sansthan, 2015, p 345–350.
4. Shastri AS. Sushruta Samhita, Sharira Sthana, 9th ed., Varanasi, Chaukhamba Orientalia, 2016, p 22–30.
5. Acharya Yadavji Trikamji, Bhavaprakasa Nighantu, 4th ed., Varanasi, Chaukhamba Orientalia, 2012, p 120–125.
6. Nagarjuna, Ashtanga Hridayam, Uttara Sthana, 5th ed., Varanasi, Chaukhambha Surbharati Prakashan, 2014, p 300–305.
7. Garg N. Role of Panchakarma in Neurological Disorders, Ayurveda & Integrative Medicine, 2019;8(1):18–24.

8. Gupta V. Management of Spasticity in Pediatric Patients, Journal of Pediatric Rehabilitation Medicine, 2021;14(3):101–108.
9. Sharma P. Modified Ashworth Scale in Pediatric Neurology, Indian Journal of Neurorehabilitation, 2022;5(2):45–52.
10. Anonymous, Guidelines for Good Clinical Practice, International Conference on Harmonization (ICH-GCP), 2016.
11. Patel R. Matra Basti in Pediatric Care, Ancient Therapies Review, 2017;5(1):12–18.
12. Prasad S. Use of Brahmi and Saraswatharishta in Neurodevelopmental Disorders, Journal of Ayurvedic Research, 2020;11(4):77–85.
13. Kulkarni S. Neuroprotective Effects of Guduchi and Vacha in Spastic Conditions, Ayurveda Clinical Review, 2021;7(3):58–66.
14. Joshi M. Vata Vyadhi: An Ayurvedic Perspective on Neurological Disorders, Ayurveda Journal, 2018;12(2):35–40.
15. Sharma A. Role of Dietary Support in Pediatric Neurodevelopment, Indian Pediatrics, 2019;56(9): 771–776.
16. Bhishagratna KR. Ashtanga Samgraha, Sharira Sthana, 7th ed., Varanasi, Chaukhambha Krishnadas Academy, 2013, p 145–155.

Cite this article as:

Anagha Narayanan. Integrative Ayurvedic management of Spastic Diplegia in a child with Periventricular Leukomalacia. Int. J. Res. Ayurveda Pharm. 2025;16(5):63-66
DOI: http://dx.doi.org/10.7897/2277-4343.165171

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: IJRAP is solely owned by Moksha Publishing House, a non-profit publishing house dedicated to publishing quality research. Every effort has been made to verify the accuracy of the content published in our journal. IJRAP cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of the IJRAP editor or editorial board members.