



EFFECT OF OCCUPATIONAL THERAPY ON A 7-YEAR-OLD SPASTIC DIAPLEGIC CEREBRAL PALSY CHILD: A CASE STUDY

Occupational Therapy

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ABSTRACT

Cerebral palsy affects two to three million children nationwide. This case report involves a 7-year-old girl with spastic diplegic cerebral palsy who presented with lower-limb spasticity, poor balance, delayed gross motor milestones, weak postural control, and unable to self-care. She received occupational therapy treatment for 24 weeks, with 40-minute sessions conducted six days per week. Outcomes were measured by using the Tardieu Spasticity Scale, the Pediatric Balance Scale, and the GMFCS. By the end of the intervention plan, her balance, trunk control, standing, mobility, self-care, and pre-academic tasks had noticeably improved. A pattern that supports the role of structured occupational therapy in improvement of this population.

KEYWORDS

Cerebral palsy, Occupational therapy, GMFCS.

1. INTRODUCTION

Cerebral palsy (CP) is a non-progressive disorder of movement and posture caused by injury to the developing brain, usually before age 2 (Hinchcliffe, A., 2007). Reported incidence sits between 1.4 and 2.4/1,000 live births and climbs in preterm and low-birth-weight infants with a higher chance of delayed motor development milestones, abnormal muscle tone, poor balance, and postural difficulty (Case-Smith & O'Brien, n.d.; Kulak & Sobaniec, 2004).

A defining feature of spasticity is a velocity-dependent rise in muscle tone when a limb is moved passively (Pendleton & Schultz-Krohn, 2013). Postural instability often makes children wary of movement, which in turn narrows the range of activities they will attempt. In the diplegic subtype, the neurological injury shows mainly on the lower limbs, so participation problems usually cluster around standing, walking, and floor-based play (Chung et al., 2011; Jaspers et al., 2009).

Occupational therapy (OT) targets both participation and impairment, drawing on sensorimotor, cognitive, and behavioural strategies (Michielsen et al., 2019). Neurodevelopmental therapy (NDT), sensory integration (SI), and multisensory balance work have each been linked with gains in postural control, coordination, and daily functioning (Sharma, 2021). No single technique addresses every limitation, so combined approaches tend to outperform isolated ones (Harjpal et al., n.d.). This report describes how an integrated OT plan shifted balance, mobility, postural control, and independence in one such child.

2. CASE PRESENTATION

2.1 Patient Information

The patient is a 7-year-old girl referred to the Department of Occupational Therapy at JSS Hospital for rehabilitation. She was born preterm at 30 weeks of gestation with a birth weight of 960 g. Early caregivers noted delays in developmental milestones. Examination later confirmed bilateral lower-limb spasticity, hyperreflexia, and delayed gross motor development. Genetic testing identified a homozygous pathogenic variant in ACP5, and neuroimaging revealed faint intracranial calcification. Together with the clinical picture, these findings supported a diagnosis of spastic diplegic CP with global developmental delay, in the setting of SPENCDI.

Therapy began during the COVID-19 pandemic but stopped when restrictions tightened. After the family moved to Mysore, she was reviewed by the pediatric team at JSS Medical College and referred back to OT department. Her mother arrived hopeful about restarting therapy, and the child herself was vocal about wanting to stand, walk on her own, play with other children, and start school.

2.2 Clinical Findings

At the first OT session, the caregiver's reports, through direct observation and examination pointed to the same picture. Her mother described struggles with long sitting, standing, walking, and self-care, and explained that school enrollment had been delayed despite her daughter's intact cognition and language.

Table 1. Clinical Manifestations and Contributing Factors

Area	Findings
Upper & lower extremity	Flexed elbow with shoulder protraction; limited overhead reach from scapulo-humeral tightness.
	Raised tone across both lower limbs, with trunk.
	Tightness through hip flexors(mild), adductors, knee flexors, and ankle plantar flexors-more pronounced on the right.
	Poor lower-limb control in standing; unable to squat or reach the floor; poor limb dissociation and incomplete hip extension.
	Mild plantar-flexion, inversion, and pronation with flat foot and valgus deformity.
Trunk & pelvic	Flexor posture during assisted walking with a scissoring pattern from adductor tightness.
	Weak trunk stability with lordotic posture; limited trunk-pelvic rotation during transitions and reaching.
Balance & motivation	Posterior pelvic tilt in long sitting; preferred W-sitting.
	Poor standing balance, fear of falling, and reduced willingness to attempt movement.

Functionally, she stood only with support of furniture. Independent standing, squatting, and floor reach were not possible. Her main means of moving across a room was bunny hopping.

2.3 Outcome Measures

Three tools tracked change. The Tardieu Scale captures spasticity by measuring how a muscle responds to passive stretch at different speeds (Gracies et al., 2010). The Pediatric Balance Scale (PBS) rates functional balance during activities children typically perform each day (Her et al., 2012). The Gross Motor Function Classification System (GMFCS) places gross motor ability into one of five levels (Palisano et al., 1997).

3. Therapeutic Intervention

The child completed an OT program built to reduce spasticity and build postural control, balance, mobility, and the everyday skills needed for pre-academic. Sessions ran for 40 minutes a day, six days a week, across 24 weeks.

Table 2. Occupational Therapy Intervention Plan

Problem identified	Occupational therapy intervention
Lower-limb spasticity	Rood sensory techniques, including slow rocking, brushing, and prolonged stretching, to reduce tone.
Poor postural control and trunk weakness	Transitional movement training, bridging, therapy-ball activities, trunk rotation, and reaching in long sitting.
Difficulty with standing and balance	Sit-to-stand training, weight shifting, equilibrium reaction training, and standing balance work.
Impaired gait and lower-limb dissociation	Assisted walking, pelvic rotation activities, kneeling to half-kneeling transitions, and graded standing.

Fear of falling and poor confidence	Guided balance and protective-reaction activities.
Poor lower-limb alignment	Knee-Ankle-Foot Orthosis (KAFO) for alignment and safe weight-bearing.

Caregiver training was an explicit part of the plan. The mother was shown positioning, stretching, mobility, and KAFO routines to carry over at home.

4. Evaluation and Post-Treatment Findings

Re-assessments were carried out at the three-month mark and again at the end of the 24-week program. Across the three outcome measures, the direction of change was consistent.

Table 3. Tardieu Spasticity Scale-Pre-and Post-Treatment

Muscle group	Pre-treatment	Post-treatment
Hip adductors	Mark spasticity	Decreased spasticity
Knee flexors	Mark spasticity	Decreased spasticity
Ankle plantar flexors	Moderate spasticity	Mild to moderate spasticity

Table 4. Pediatric Balance Scale (PBS) Total Scores

Measure	Pre-treatment	Post-treatment
PBS total score	8	28

Table 5. Gross Motor Function Classification System (GMFCS)

Measure	Pre-treatment	Post-treatment
GMFCS level	III	II

Sitting balance was the first visible gain. She held cross sitting, side sitting, and long sitting with better trunk rotation and weight shifting. Standing posture and lower-limb alignment improved next, alongside greater hip flexibility and pelvic control. Functional mobility progressed from supported standing to brief periods of independent standing, with cruising and walking with help of a KAFO. Her fear of falling reduced, and she began joining in self-care, play, and early school-related tasks.

5. DISCUSSION

The objective of this case study was to evaluate the effect of an occupational therapy program on both motor function and the foundational skills needed for pre-academic. The results echo earlier work. Harjpal et al. reported similar gains in trunk and pelvic control, with progression toward independent walking, after NDT-led therapy (Harjpal et al., n.d.). Turhan and Gunes Yavuzer found that pairing sensory integration with conventional therapy lifted balance and independence in diplegic CP (Turhan & Yavuzer, 2025). DeGangi documented gains in standing and early walking after a short NDT block (DeGangi, G. A, 1994). Sahoo et al. showed that extended standing through positioning devices raised PBS scores (Sahoo, J., et al. 2020). The child can now sit through structured activities and is being prepared for entry into a school setting. Benson et al. argued that mobility-focused interventions directly contribute to academic participation, independence, and community involvement in CP is a position this case supports (Benson et al., 2019).

One shortcoming worth mentioning. A case study describes what happened with one child; it cannot isolate the contribution of any single technique within a multi-component program. Causal claims should therefore stay modest, and application to be done on larger sample.

6. CONCLUSION

The intervention produced meaningful gains across balance, mobility, postural control, and functional independence. Independent walking has not yet been completely achieved, and the child still needs moderate help with lower-extremity dressing and remains partially dependent for grooming and toileting. Even so, the trajectory is upward, and the case supports the use of integrated OT programs in children with spastic diplegic CP.

Ethical Consideration

Written informed consent was taken from the child's parent for publication of this case report.

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