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Effectiveness of Static Stretching and Kinesio Taping of Lower Limbs on Improving Dynamic Balance in Spastic Diplegic Cerebral Palsy Child - A Case Study

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Abstract: ***Background: Spastic diplegic cerebral palsy (CP) predominantly affects the lower limbs, resulting in spasticity, gait abnormalities, and impaired dynamic balance. Although physiotherapy plays a critical role in managing these deficits, there is limited evidence regarding the combined effectiveness of static stretching and Kinesio taping (KT) in improving balance and functional mobility in this population. (Kaya Kara et al., 2015; Rajabi et al., 2020). Objective: To evaluate the effectiveness of static stretching and Kinesio taping in enhancing dynamic balance in a child with spastic diplegic CP. (Elbasan et al., 2018) Methodology: A single-case experimental study was conducted over six months involving a 10-year-old male diagnosed with spastic diplegic CP (GMFCS Level II). The intervention included daily static stretching, alternate-day KT application targeting hip flexors, abductors, and ankle plantar flexors, balance training, and a caregiver-supervised home exercise program. The Pediatric Berg Balance Scale (PBBS) was used to assess dynamic balance pre- and post-intervention. Results: The PBBS score improved significantly from 10 (pre-intervention) to 39 (post-intervention), indicating a notable enhancement in dynamic balance and functional mobility. (Dabhi & Rakholiya, 2020), (Kase et al., 2003; Zafar et al., 2021) Conclusion: The combination of static stretching and Kinesio taping proved to be effective in improving dynamic balance in a child with spastic diplegic CP. These findings support the incorporation of these modalities as adjuncts to conventional physiotherapy for better functional outcomes in similar clinical populations. (Pina et al., 2022; Özmen et al., 2021).***

Keywords: Spastic Diplegic, Kinesio Taping, Static Stretching, Dynamic Balance, Pediatric Physiotherapy

1. Introduction

Cerebral palsy (CP) is a group of motor deficits induced by non-progressive brain damage in children and occurs globally in both developed and developing countries. Spastic diplegia, a common subtype of CP, primarily affects the lower limbs and is associated with spasticity, muscle contractures, and gait abnormalities. These impairments often lead to postural instability and difficulties in dynamic balance. Physiotherapy interventions, including static stretching and Kinesio taping (KT), aim to improve functional mobility and balance in children with CP.

Aim of the Study

To evaluate the effectiveness of static stretching and Kinesio taping in improving dynamic balance in a child with spastic diplegic cerebral palsy.

Need for the Study

Despite extensive literature on CP management, there is limited evidence focusing on the combined effects of static stretching and KT in spastic diplegic CP. This study provides insights into these interventions for improving dynamic balance and functional mobility.

2. Methodology

- Study Design: Single-case experimental study
- Study Type: Case study
- Sample Size: 1
- Duration: 6 months
- Setting: Suncity, Hyderabad, Telangana

Inclusion Criteria:

- Male subject, age 10
- Diagnosed with spastic diplegic CP (GMFCS Grade II)

Exclusion Criteria:

- Female subjects
- Age below 5 or above 15 years
- Dyskinetic or ataxic CP
- Systemic illness

Outcome Measure: Pediatric Berg Balance Scale

Patient Information

The subject, a 10-year-old male, was a full-term LSCS baby with neonatal seizures on day 5 of life and delayed milestones. Initially active, he developed gait difficulties by age 3. Orthopedic interventions included bilateral distal femur derotation osteotomies and tendon transfers in May 2024. Post-surgery physiotherapy was administered at home for six months.

Clinical Findings

The patient demonstrated crouch gait, bilateral toe walking, articulation deficits, and GMFCS Grade II classification. Dynamic balance was impaired, though gross motor and self-

care functions were mildly affected. IQ and social skills were normal.

Physiotherapy Intervention

- Stretching: Static/prolonged stretches (30–60 sec, daily, 20–30 min sessions)
- Balance Training: Swiss ball and proprioceptive exercises
- Kinesio Taping: Applied bilaterally at hip flexors, abductors, and ankle plantar flexors on alternate days
- Home Program: Caregiver-lead balance and stretching exercises
- Duration: 6 months

3. Results

Dynamic balance improved significantly. Pediatric Berg Balance Scale scores increased from 10 (pre-test) to 39 (post-test) (out of 56), indicating ~70% functional improvement. The child could stand with minimal support and showed improved proprioception.

4. Discussion

The findings align with literature supporting early physiotherapy, weight-bearing, and KT in CP. Stretching reduces spasticity and improves ROM, while KT enhances proprioceptive feedback. Integration of these modalities can aid posture, gait, and functional independence.

5. Conclusion

Static stretching and Kinesio taping are effective, non-invasive adjuncts to conventional physiotherapy for spastic diplegic CP. These interventions improved dynamic balance and functional mobility in this case.

Author's Contribution

All authors contributed equally to study design, data acquisition, and analysis.

Informed Consent

Written informed consent was obtained from the patient's guardian.

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