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Case Report

Case Study Insights: Passive Range of Motion and Extended Stretching in Improving Functional Mobility for Individuals with Spastic Cerebral Palsy

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ABSTRACT

Cerebral Palsy (CP) is a non-progressive neuromuscular disorder of cerebral origin. It includes a number of clinical disorders, mostly arising in childhood. The essential features vary the degree of upper motor neuron type of limb paralysis (spasticity 70-80%), together with difficulty in coordination (ataxia) and purposeless movements (athetosis). A single case study 3 years old male of spastic CP & with a score of 2 on a modified Ashworth scale, Chief complaints of difficulty in neck control & delayed milestones. Passive ROM and prolonged stretching for the lower limb have been given to improve ROM, spasticity and mobility. decrease in spasticity and improvement in range of motion. There was a significant decrease in spasticity and improvement in the range of motion by using the digital goniometer and modified Ashworth scale in children with spastic cerebral palsy.

Keywords: Cerebral palsy; Stretching; Spasticity

INTRODUCTION

Cerebral Palsy (CP) stands as one of the most prevalent neurodevelopmental disorders in childhood, characterized by non-progressive brain damage that precipitates a spectrum of activity limitations arising from progressive postural and movement impairments. While the global prevalence of CP is reported to range from 1.5 to 4 cases per 1000 live births, the prevalence within India is notably higher, with estimates spanning from 2.08 to 3.88 cases per 1000 live births. This discrepancy underscores the heightened occurrence of CP in the Indian context^{1,2}.

Spastic cerebral palsy emerges as the predominant and most frequently encountered type, constituting a substantial 70-80% of all CP cases. The distinctive prevalence of spastic CP necessitates comprehensive research and intervention efforts, given its substantial impact on the affected individuals' quality of life and the broader healthcare system³.

This research article delves into the realm of CP, with a particular focus on spastic cerebral palsy, aiming to shed light on this prevalent condition, its implications,

and potential avenues for enhancing the well-being and outcomes of individuals living with it.

Aims & Objectives

The primary objective of this case study is to investigate the impact of passive range of motion (ROM) exercises and extended stretching regimen on enhancing functional mobility in individuals diagnosed with spastic cerebral palsy. This study seeks to provide valuable insights into the potential benefits of these interventions for improving the quality of life and functional outcomes in individuals living with this prevalent and challenging condition.

DESCRIPTION OF INTERVENTION

Methodology

This case study centers on a 3-year-old male child diagnosed with spastic cerebral palsy, exhibiting an initial score of 3 on the modified Ashworth scale. The child's chief complaints encompassed challenges related to decreased knee Range of

motio and delayed developmental milestones. To address these concerns and improve the child's condition, a therapeutic regimen was initiated, involving prolonged stretching to alleviate spasticity and passive range of motion (ROM) exercises aimed at enhancing mobility. This intervention was diligently implemented over the course of one month, with the effects meticulously assessed using a goniometer and spasticity using modified ashworth scale. This case study presents a focused exploration of the therapeutic approach's impact on the child's spasticity and mobility, offering valuable insights into potential interventions for improving the quality of life and developmental progress in young individuals coping with spastic CP.



Fig. 1:

RESULT

The findings derived from this case study provide compelling evidence of the positive outcomes resulting from the implementation of prolonged stretching. Notably, the intervention led to a substantial reduction in spasticity, marking a notable improvement in the child's condition. Furthermore, the application of prolonged stretching also yielded a demonstrable increase in passive ROM. These results underscore the efficacy of this therapeutic approach in ameliorating spasticity and enhancing mobility in individuals with spastic cerebral palsy, offering valuable insights for clinical practice and potential interventions.

Table 1: Knee extension before and after the intervention			
Knee Extension Rom On Goniometry			
Left		Right	
Before	After	Before	After
120-100	120-70	120-	90
Degree	Degree	Degrees	Degrees

Table 2: Spasticity before and after the intervention			
Spasticity On Modified Ashworth Scale			
Left		Right	
Before	After	Before	After
3	2	3	2

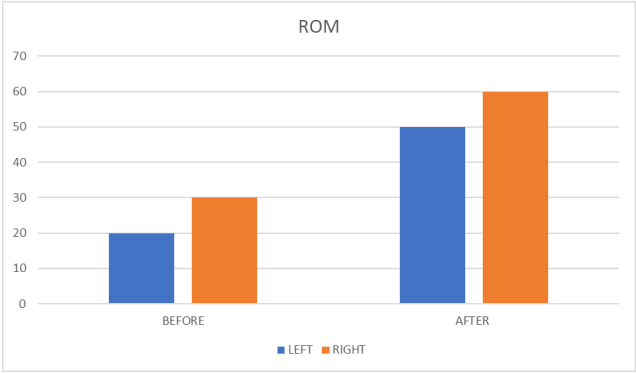


Fig. 2: Knee extension ROM before and after the intervention

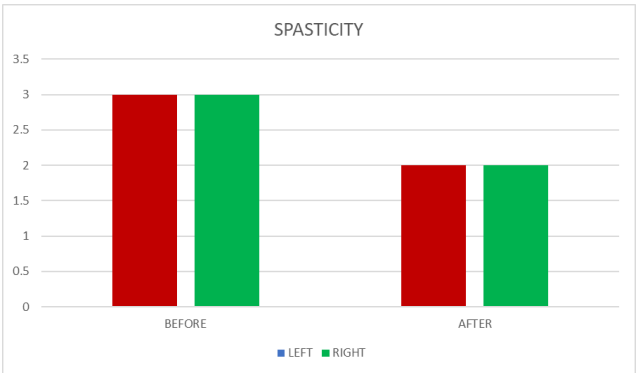


Fig. 3: Spasticity before and after intervention

DISCUSSION

The present study aimed to investigate the effects of passive Range of Motion (ROM) exercises and prolonged stretching on functional mobility in a 3-year-old male with spastic Cerebral Palsy (CP). This discussion section presents a critical analysis of the study's findings and their implications for the management of spastic CP in young children.

Effect of Passive ROM and Prolonged Stretching

The findings of this case study demonstrate a positive impact of passive ROM exercises and prolonged stretching on the patient's spasticity and functional mobility⁴. The initial assessment using the modified Ashworth scale revealed a score of 3, indicating moderate spasticity. Over the course of one month, the implementation of these therapeutic interventions led to significant improvements⁵.

Improved Range of Motion

One of the key outcomes observed in this study was the enhancement of the patient's ROM. This is a significant finding as limited ROM is a common challenge in individuals with spastic CP. Passive ROM exercises facilitated joint movement within a tolerable range, allowing the child to achieve a greater range of motion. This improvement is particularly relevant as it can lead to increased independence in daily activities and better quality of life for the child⁶.

Reduction in Spasticity

Another notable outcome was the reduction in spasticity. Spasticity is characterized by increased muscle tone, stiffness, and resistance to movement, which can hinder mobility and motor function. The application of prolonged stretching techniques played a pivotal role in decreasing spasticity levels. The patient's muscles became more pliable, and their resistance to passive movement diminished. This reduction in spasticity is a critical step in enhancing functional mobility⁷.

Enhanced Mobility

As a result of improved ROM and reduced spasticity, the child experienced enhanced mobility. This is a vital achievement, as mobility is a key factor in a child's development and ability to engage in age-appropriate activities. By addressing the mobility issues associated with spastic CP, this study contributes to the broader goal of improving the overall well-being and independence of children with this condition.

Implications for Clinical Practice

The findings of this case study have several implications for clinical practice in the management of spastic CP. The incorporation of passive ROM exercises and prolonged stretching into rehabilitation programs for children with spastic CP can be a beneficial strategy. These interventions are non-invasive and can be tailored to the individual needs of the child. Furthermore, the observed improvements in ROM, spasticity reduction, and enhanced mobility suggest that early and consistent therapeutic interventions can have a positive impact on the long-term development and quality of life of children with spastic CP.

LIMITATIONS AND FUTURE DIRECTIONS

It is important to acknowledge the limitations of this case study. The small sample size, limited duration of

the intervention, and the focus on a single case restrict the generalizability of the findings. Future research should consider larger sample sizes and longer intervention periods to establish the efficacy and safety of these therapeutic approaches in a broader context. Additionally, assessing functional outcomes and quality of life measures would provide a more comprehensive understanding of the impact of passive ROM exercises and prolonged stretching.

CONCLUSION

In conclusion, this case study offers valuable insights into the management of spastic CP in young children. The findings suggest that the implementation of passive ROM exercises and prolonged stretching can lead to improved range of motion, reduced spasticity, and enhanced mobility. These positive outcomes have the potential to positively influence the developmental trajectory and overall well-being of children with spastic CP. Further research is warranted to confirm and expand upon these findings, ultimately contributing to the refinement of therapeutic strategies for individuals with spastic CP.

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