

Case Report

## Effectiveness of Multidisciplinary Physiotherapeutic exercise on the patients with Spastic Diplegic Cerebral Palsy

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### ABSTRACT

**Background and Objectives:** Cerebral Palsy (CP) describes as a group of permanent disorder of development of movement and posture causing activity limitation that are attributed to non-progressive disturbances occurred in developing fetal or infant brain. Objective of this study to assess the effectiveness of different physiotherapy treatment technique and exercise protocol used in patients with cerebral palsy. Aim: To study the effect of multidisciplinary physiotherapeutic exercise on the patients with spastic diplegic cerebral palsy.

**Method:** multidisciplinary physiotherapeutic exercise is given on the patients with spastic diplegic cerebral palsy including PNF technique, Rood's approach, Vojta technique, MFR, passive movement, weight-bearing exercises, as well as prolonged stretching.

**Result:** physiotherapeutic treatment, he was able to improve his head and neck control and balance her posture. He was able to stand with minimal support using a Knee Ankle Foot Orthosis (KAFO).

**Conclusion:** multidisciplinary physiotherapeutic) improved gross motor functions and social skills while having a minor impact on GMFCS.

**KEYWORDS:** Spastic diplegic cerebral palsy, Physiotherapy, PNF, Vojta technique, MFR, GMFCS.

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### INTRODUCTION

Cerebral Palsy (CP) describes as a group of permanent disorder of development of

movement and posture causing activity limitation that are attributed to non-progressive disturbances occurred in developing fetal

or infant brain. The motor disorders of CP are often accompanied by disturbances of sensation, perception, cognition, communication and behaviour as well as seizures and secondary musculoskeletal problems [1].

CP has been historically categorized topographically and physiologically. Based on limb involvement, CP is categorized topographically as involving one limb (monoplegia) or all four limbs (quadriplegia). Physiologically, patient's present with tone that can be categorized as spastic, flaccid, rigid, dystonic or athetoid[2]. Brain damage can be caused by a variety of factors, such as hypoxic ischaemic neonatal encephalopathy (HINE), trauma, anoxia, intracranial hemorrhage, hypoglycemia, viruses, and other illnesses, as well as aberrant brain development. There are prenatal, perinatal, and postnatal causes of cerebral palsy. In all cases, it is an immature nervous system which suffers the insult and the nervous system afterwards continues to develop in the presence of the damage [3]. Spastic muscles may have specific structural changes due to adaptability to abnormal use or disuse. Initially spastic muscles are however structurally normal though not normally extensible [4]. Most preterm newborns with cerebral palsy (CP) have spastic diplegia (affecting both legs), especially those born with birth weights under 1000 grams [5]. Spastic diplegia has been linked to more global developmental delays and moderates to severe intellectual disability in term-born children than in preterm-born children [6]. Pharmacological (botulinum toxin), intrathecal pump, and surgical (orthopaedic surgery) management are common and effective treatments for spastic diplegia. Other traditional physiotherapy techniques to improve gait, balance, and coordination of lower limb function include occupational therapy, neuro-developmental therapy, constraint-induced movement therapy, Sensorimotor training program, and balance training [7,8].

Since physical activity has been linked to gains in energy, endurance, self-esteem, social participation, and overall enjoyment, it is beneficial for all children. Children with cerebral paralysis may not exhibit specific

spatial and temporal muscle activation (CP) [9]. Physiological brain organization may be disturbed during early developmental stages by motor training and forced use. On the other hand, children who were referred earlier improved their motor development more during the follow-up examination than those who were referred later [10].

#### **PATIENT INFORMATION:**

A case of a 4.5-year-old male child with spastic diplegia who was diagnosed with using the GMFCS evaluation scale, I was diagnosed with stage V spastic diplegic cerebral palsy. patient was born on six and half months and patient two months NICU stay, according to a mother. Doctor suggests physiotherapy treatment and start physiotherapy.

#### **CLINICAL FINDINGS:**

This study focuses on the lower limbs and trunk. Gross motor and self-care functions were both harmed. The patient was completely depending on the family member and would be unable to function without them. He could sit, but his truncal balance. The lower limbs showed a scissoring gait pattern, tight hip adductor and flexor muscles, and symmetrical spasticity. The cardiovascular and respiratory systems were also normal.

#### **PHYSIOTHERAPY INTERVENTION:**

A qualified neuro-physiotherapist provided physiotherapy to the patient in the Neuro-physiotherapy OPD. The purpose of the exercise was to improve her conditions. Educate the family about child with cerebral palsy. provide support in their acceptance of child. Goal setting and programming should do with family. Be realistic about the prognosis and efficacy of patient while remaining hopeful. Parents advised to lift and handle the child such that both the child and parent should prevent the abnormal dominant pattern of the child and feel secure and safe. advised to lift the child with straight back, wide base of support, flexed knees and hold the child as close to the body as possible. The patient was given PNF technique (rhythmic imitation, slow reversal technique), Rood's approach, Vojta technique, Myofascial release

technique (MFR), passive movement, weight-bearing exercises, as well as prolonged stretching. He was able to stand with only minimal assistance after being fitted with a Knee Ankle Foot Orthosis (KAFO) to aid maintain her balance when standing. Activity specific lower limb training, Sit to Stand, Single leg standing like activities, muscle stretching exercises was given to the patient to perform at home as the part of Home Exercise Program.

## RESULT

His improved faster gross motor coordination. After three months of physiotherapeutic treatment, he was able to improve his head and neck control and balance her posture. He was able to stand with minimal support using a Knee Ankle Foot Orthosis (KAFO).

## DISCUSSION

CP is the leading cause of physical disability in children, occurring in 2 to 2.5 per 1000 live births worldwide[11]. Globally Published literature has reported that the range of CP from 1.5 to 4 per 1000 live births but the prevalence range reported for India is higher ranging from 2.08 to 3.88 per 1000 live births [12]. Immature delivery, epilepsy, Vascular events, Maternal infections, metabolic disorders, Obstructed labour, Antepartum haemorrhage, Cord prolapse is most common causes for cerebral palsy. In this study patient cause was immature delivery, epilepsy that's why patient is diplegic cerebral palsy. Cerebral palsy (CP) is a term that refers to a group of developmental impairments that affect mobility and posture and create activity impairment. Hip dysplasia, which is caused by stiffness and rigidity of the hip adductor and hip flexor muscles, is the second most common musculoskeletal defect in cerebral palsy children[13]. GMFCS stages IV or V are at a higher risk of hip displacement, early use of posture control devices has been found to avoid hip difficulties. It is recommended that standing services be provided to children with cerebral palsy who come under the Postural Management System and are unable to stand by the time they are 12 to 18 months old. Children with cerebral palsy who are 12 to 18 months old should begin weight-bearing as

part of their standing routine. The standing technique included using a frame for hip abduction in addition to a usual physical therapy regimen. The standing group began the program at the age of 12–14 months and completed it at the age of five years[14].

Limitations in passive range of motion and anomalies in the skeletal muscles are common in children with spastic cerebral palsy (spastic CP), and they often get worse as they get older. The use of botulinum toxin, orthotics, and orthopaedic procedures to treat restricted PROM has a significant impact on their mobility and quality of life. Sharma P et al. in their study applied PNF to spastic diplegic cerebral palsy patients and concluded that it decreases spasticity, improve gross motor function and truncal balance[15]. Dhanashree S. Upanlawa et al. in their study applied Rood's approach, PNF and concluded that The child was walking independently with a proper gait pattern and was able to maintain both static and dynamic balance[16]. Sanz-Mengibar JM et al. concluded that Vojta therapy has shown to accelerate the acquisition of GMFM-88-items and Locomotor Stages in children with cerebral palsy younger than 18 months. Because functional training was not utilised, and other non-Vojta therapy intervention did not influence the outcome, Vojta therapy seems to activate the postural control required to achieve uncompleted GMFM-88-items[17]. JIBI PAUL et al. concluded that myofascial Release is effective to decrease spasticity in spastic diplegic cerebral palsy children. This present study decreases spasticity, improve gross motor function and truncal balance, minor impact GMFM-88-items[18].

## CONCLUSION

According to the findings of the study, physiotherapy treatment such as weight-bearing exercises, MFR, PNF technique, Rood's approach, Vojta technique, passive movement, prolonged stretching, home exercise program, and the use of a Knee Ankle Foot Orthosis (KAFO) improved gross motor functions and social skills while having a minor impact on GMFCS.

## ABBREVIATIONS

**CP:** Cerebral Palsy

**KAFO:** Knee Ankle Foot Orthosis

**PNF:** proprioceptive neuromuscular facilitation

**GMFCS:** gross motor function classification system

**MFR:** Myofascial release

**Conflicts of interest:** None

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