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Research Papers

THE EFFECT OF PROGRESSIVE MOVEMENT PATTERN IN REHABILITATION OF CEREBRAL PALSY

Narkeesh A
Reader, Department of Physiotherapy,
Punjabi University, Patiala

Milky
Student MPT Neurology

Abstract

BACKGROUND: *Cerebral Palsy is a non-progressive motor disability. Various treatment approaches are used for its rehabilitation. Progressive movement pattern technique has been used in this case and its effect pre and post treatment have been compared. CASE HISTORY: A 15 month old male child presented with inability to sit independently corresponding to the age. He also has motor delay and spasticity in major group of muscles in both the lower limb. When assessed with modified Ashworth scale of spasticity, the child score 1+ for both the lower limb muscles and Gross Motor Function Classification System for Cerebral Palsy, the child score level 4.*

The child was treated with Progressive Movement Pattern Technique, the spasticity rating was 0 for both the lower limb muscles and GMFC score was level 2. Progressive Movement Pattern technique has proven to be effective in rehabilitation of cerebral palsy. This helps the child to sit independently without support and partial crawling. METHODS AND MATERIALS USED: The patient was given a session for 45 minutes each day for five days a week for 45 days and MAS and GMFC were recorded on day 0 and day 45. The treatment consists of Progressive Movement Pattern technique.CONCLUSION: A significant reduction in the score of MAS and increase in GMFC and therefore it can be said that Progressive Movement Pattern Technique is effective in rehabilitation of Cerebral Palsy

KEY WORDS: cerebral palsy, child, motor delay, spasticity, physiotherapy.

EFFECT OF PROGRESSIVE MOVEMENT PATTERN TECHNIQUE INREHABILITATION OF CEREBRAL PALSY: CASE STUDY

BACKGROUND:

Cerebral palsy is primarily a disorder of movement and posture. It is defined as an "umbrella term covering a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development"(Mutch,1992).

CP is a common problem, the worldwide incidence being 2 to 2.5 per 1000 live births (Rosen and Dickinson, 1992). When Little first described CP, he attributed the cause of CP to birth trauma and this view has persisted for several decades. Recent advances in neonatal management and obstetric care have not shown a decline in the incidence of CP (Nelson, 2003). On

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the contrary, with a decline in infant mortality rate, there has actually been an increase in the incidence and severity of CP. The incidence in premature babies is much higher than in term babies. For the vast majority of term infants who develop CP, birth asphyxia or obstetric complications cannot be ascribed as the cause (Kuban and Leviton, 1994, MacLennan, 1999).

Cerebral palsy is a static neurologic condition resulting from brain injury that occurs before cerebral development is complete. Because brain development continues during the first two years of life, cerebral palsy can result from brain injury occurring during the prenatal, perinatal, or postnatal period (Bass, 1999). Seventy to 80 percent of cerebral palsy cases are acquired prenatally and from largely unknown causes. Birth complications, including asphyxia, are currently estimated to account for about 6 percent of patients with congenital Cerebral Palsy (Taylor, 2001). Neonatal risk factors for cerebral palsy include birth after fewer than 32 weeks' gestation, birth weight of less than 2,500 g, intrauterine growth retardation, intracranial hemorrhage, and trauma. In about 10 to 20 percent of patients, cerebral palsy is acquired postnatally, mainly because of brain damage from bacterial meningitis, viral encephalitis, hyperbilirubinemia, motor vehicle collisions, falls, or child abuse (Taylor, 2001).

Seventy to 80 percent of patients with cerebral palsy have spastic clinical features. Affected limbs may demonstrate increased deep tendon reflexes, tremors, muscular hypertonicity, weakness, and a characteristic scissors gait with toe-walking. The athetoid or dyskinetic type of cerebral palsy, affecting 10 to 20 percent of patients, is characterized by abnormally slow, writhing movements of the hands, feet, arms, or legs that are exacerbated during periods of stress and absent during sleep (Taylor, 2001). The rarest form, ataxic cerebral palsy, affects 5 to 10 percent of patients and predominately impairs balance and coordination. These patients walk with a wide-based gait and have intention tremors that complicate performance of daily activities requiring fine-motor function (Taylor, 2001).

Intellectual impairment occurs in about two thirds of patients with cerebral palsy. About one half of pediatric patients have seizures. Growth problems are common, as well as neurologic abnormalities such as impaired vision or hearing and abnormal touch and pain perceptions (Taylor, 2001)

The mildest stage of cerebral palsy will have only the awkwardness of movements and hand functions. But the severe condition of the cerebral palsy will cause for many disabilities like loss of muscle control, motor delay, disability to walk and speak, hearing impairment, and vision problems. The disabilities of the affected are depending up on the severity of damage and area of damage happen to the brain.

Physiotherapy treatment approaches such as Progressive Movement Pattern technique, Brunnstrome technique, PNF technique, Bobath technique, Rood's technique, Vojta technique, conductive education etc may help in the rehabilitation of Cerebral Palsy. All these treatment approaches have some or the other benefits to a child with developmental disabilities. It is very difficult to single out any of the treatment approach. There is no scientific data available for the comparison. A few organizations have tried to establish the difference among all these approaches but it is halfway done. As there is no standard or specific protocol available for a disorder. It is always kept in mind that a treatment approach should fit into the specific treatment programme of a child rather a child should be fitted in a treatment approach.

CASE REPORT:

A 15 month old male child presented with inability to sit independently corresponding to the age. Mother is a source of history. Child is having a prenatal history of induced hypertension in mother with oligohydramnios. Child is having a perinatal history of normal labor pain at gestation period of 38 weeks. Delivery was done at hospital. Mode of delivery was lower segment caesarian section. Fetus was having a vertex presentation in uterus. No history of perinatal trauma or Rh incompatibility. Post natal history include immediate cried after birth, normal body temperature, body weight was 1600gm which is small for gestation age, head circumference is 30.6cm, length is 44cm(both head and length is small for gestation age). Child is also having a history of seizures, meningitis and thrombocytopenia and candidiasis. Child is having APGAR score of 8 at 1min and 9 at 5 min.

Baby was shifted to nursery on day 3 of life due to seizures and treatment was given. In the nursery baby's RBC's come out to be low and was treated for hypoglycemia. Baby was handed over to mother but after 2 days baby was found to be hypothermia and lethargy. Then urine was send fungal hyphal. On gm stain it was positive for gm

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+ve, budding and pseudohyphale suggestive of candidiasis. Treatment was given for this.

MRI was done which shows acute infarct left parieto-occipital lobe with fresh focal infacts, right periventricular and white matter with small haemorrhagic focus left caudate nucleus.

There was no relevant family history. Child is having a delayed gross motor and language milestones but social and fine motor milestones was achieved at normal age except pincer grasping.

On observation, hearing and vision was normal. Child was having a good oral motor control, tongue movement was present but blowing and tongue rolling was absent. Child was transferring object from one hand to other and was opening and closing hand for grasp. Gross grasp was present and fine grasp was absent. Primitive reflexes were present except oral, palmar and tonic neck reflex.

On examination ear, eye, head, face all was symmetrical, mouth, palate, tongue was normal. Squint was present in both the eyes. Muscle tone was slightly increased in hamstrings, adductors and gastrocnemius in both the lower limb (MAS-1+), voluntary control was present, no involuntary movements, no contractures or deformity was seen. Passive ROM was complete at all the joints. According to cognitive function, child was active and responds to both voice and external environment. According to functional ability, child was only rolling from supine to prone and vice versa (GMFC- level 4). On basis of history and examination, clinical diagnosis of diplegic spastic cerebral palsy was made.

The child was given treatment comprises of progressive movement pattern technique along with range of motion exercises and passive rhythmic movement. The session lasted for 45 minutes each day for 5 days a week for 45 days. Treatment includes pull to sit, pull to side sit, quardripode position, reciprocol crawling, cross sitting with minimum support, improving sitting balance on swiss ball, reaching exercises in different positions. Treatment also includes exercises to improve grasp, parent's education and home program in which parents were advice to repeat the exercises at home, proper carrying and lifting technique were also taught.

The assessment reading for day 0 were MSA- 1+ and GMFC- level 4. After a rehabilitation protocol of 45 days, reading was again noted, these were MSA- 0 and GMFC- level 2. A significant change was observed in the assessment outcome of the patient. The child was now able to sit without support and was crawling partially, this was noted on GMFC.

DISCUSSION:-

This case involves the implication of Progressive Movement Pattern technique in the rehabilitation of Cerebral Palsy. The present study deals with the problem of motor delay due to Cerebral Palsy and effect of Progressive Movement Pattern Technique. The study was done based on the readings of the child's functional outcomes for duration of 45 days. The treatment comprises of Progressive Movement Pattern technique was given and readings of 0 and 45 days and significant difference in readings of MAS and GMFC was found. The GMFC level increase and spasticity as rated on MAS showed reduction from day 0 to day 45 which were the main aim of the treatment. The function ability of the child improved after 45 days, the child was able to sit independently without support and crawling partially.

CONCLUSION:-

CP is a chronic condition with considerable impact on affected individuals. Cerebral Palsy is one of the three most common lifelong developmental disabilities, the other two being autism and mental retardation causing considerable hardship to affected individuals and their families. This case successfully concluded that Progressive Movement Pattern technique produces significant differences in the functional outcomes of the child. Therefore, it can be concluded that Progressive Movement Pattern technique is an effective method in rehabilitation of Cerebral Palsy.

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