

Case Report

A Case Study on the Post Botox Physiotherapy Management in Diplegic Cerebral Palsy

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Abstract: Cerebral Palsy (CP) is also known as static encephalopathy that is its non-progressive injury or a threat to an immature brain. In this case study, an attempt of applying Bobath technique along with skin stimulation (component of Rood's approach), manual passive stretching, Play based therapy, Gait training and orthotic support on four year old diplegic spastic CP girl has been done after receiving one round of intra-muscular (IM) Botox on Bilateral hamstrings. At the end of 4 weeks (one month) marked improvement has been observed not only in knee range of motion (ROM) but also in ankle and hip ROM. Overall activity of patient has been assessed by Gross motor function classification system, which has been improved from level IV to level III. So, this case study helped in identifying the effects of physiotherapy techniques along with botox in spastic CP child.

Keywords: cerebral palsy, CP, Spastic, Botox, Bobath, Rood, Play based therapy.

INTRODUCTION:

Cerebral Palsy (CP) is also known as static encephalopathy that is its non-progressive injury or a threat to an immature brain. Prevalence of cerebral palsy in district Swabi, Khyber Pakhtunkhwa – Pakistan is about 1.22/1000 live births and the most common type (Aziz Ahmad, 2017) and most common type is spastic but it can be prevented by good antenatal care and on time right services, this study was conducted in National institute of child health (NICH), Karachi (Suresh Kumar, 2016). Botulinum toxin (BOTOX) is a neurotoxin which blocks the neuromuscular signals and ultimately decreases spasticity. Application of Botulinum toxin is effective for treatment of spastic CP if injection criterion is valued along with technical postulates and there are very little adverse effects of it (ALEXANDRU ULICI, 2017).

The Bobath Concept is goal orientated and task specific, and its concept is a problem-solving and therapeutic approach in individuals with central nervous system lesion (Raine, 2007). Bobath approach works on inhibiting abnormal reactions of the body through reflex inhibitory patterns and encourage normal reactions through key point of control, ultimately helps in developing movement sequences through balance

reactions and indulge patient in play activity and ADLs (Activities of daily living) by developing functional skills (Sue Raine, 2009).

Roods approach has following components (Eckersley, 1993):

- Normalization of tone.
- Sensorimotor control.
- Purposeful movement.
- Repetition of sensorimotor response.
- Facilitatory & inhibitory techniques

It is a neurophysiological idea developed by Margaret Rood in 1940 (Therapy, 1954).

First part of treatment sequence is skin stimulation followed by weight bearing, movement and developmental sequence (Eckersley, 1993).

'Regular stretch does not produce clinically important changes in joint mobility, pain, spasticity or activity limitation in patients with neurological conditions.' (Katalinic OM, 2011).

Functional stretching exercises were effectively used in rehabilitation of spastic diplegic

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children; it increased popliteal angle, and improved gait (Mohamed Ali Elshafey, 2014).

PLAY promote an active lifestyle through increased participation, motivation, and engagement in physical activities (Kyriakidou, 2016).

CASE REPORT:

Basic information of the patient

- Age: four years
- Gender: Female
- Religion: Islam
- Socioeconomic status: middle class
- Mother is house wife and work is a store supervisor.
- Chief Complaints:
- Global Developmental Delay and increased tone in body.

Brief History:

Known case of diplegic CP child, birth through Emergency LSCS due to hypertensive mother and Intrauterine growth retardation (IUGR). Stay in incubator due to low birth weight (LBW). No history of epileptic episode up till now according to her mother. Neck control and other milestones were delayed. The child was being given tablet Baclofen (as a muscle relaxant) she received physiotherapy in her early age for achieving her neck control and sitting after that parents hold physiotherapy due to family issues. No consanguinity found.

On Examination:

Gross motor function classification system (GMFCS) was IV. Modified Ashworth scale was on level III. Hyper tonicity was lead pipe type. Feet were planterflexed, few primitive reflexes have been observed (e.g: planter and palmer grasp). Manual Muscle test (MMT) was Hip flexor 1, hip abductors 1, hip adductors 3, knee extensors 2, knee flexors 1 and ankle dorsiflexors on 0.

She ambulated with poor trunk rotation with maximum support, increased adduction bilaterally during swing phase causing forefoot to hit heel of stance phase leg ("scissoring"), decreased terminal knee extension in stance phase due to tight hamstrings (crouched posture), and initial contact at her forefoot/toes due to increased plantarflexor tone and decreased ankle range of motion (ROM) 5 degree, popliteal angle 50 degree, hip abduction 10 degree. Owing to her inefficient and effortful gait pattern, she used a manual wheelchair for long distances and for a short distance she tries to crawl.

Increased tone was present, suggested upper motor neuron disease (which is the hallmark of CP). Babinski sign was also positive. Meningeal signs were not present.



Figure 1: posture of patient on day one in OPD.

Observe scissoring hip adductors and equines feet. picture courtesy: Liaquat National Hospital, Department of Physiotherapy, Peads Rehabilitation Unit, Dr. Noureen Fatima.

Treatment Protocol:

She has received one round of intra-muscular (IM) Botox on Bilateral hamstrings. Following IM BOTOX, she had an acute in-patient stay where she received physical therapy for bed mobility and transfer training.

Once she was discharged from the hospital, she returned to undergo an outpatient physical therapy. Goals were to improve muscles length, to improve muscles power, trunk control, muscle tone and gross motor function.

One month extensive physiotherapy plan was designed for her including: Stretching Exercises (10 repetitions 20 seconds hold), orthotic support (for six hours in a day), Gait training on parallel bars, positioning, PLAY based therapy (included Gym ball and Balance board), Bobath technique was applied for inhibiting abnormal body reactions, skin stimulation (3 sec skin stimulate at one place, delay of 30 sec before any effect is seen) from roods approach applied.

Patient/parent education: Emphasis on ambulation and functional strengthening, frequency of stretching thrice a day 10 repetitions with 20 sec hold and 2 hourly on and off splinting with HKAFO.

Re-Assessment after One Month:

Now she need moderate physical assistance to perform sit-to-stand transfer; floor-to-stand transfer deferred at this time. Can ambulate herself on parallel bar with B/L knee braces and AFOs with moderate assistance of physiotherapist.

MMT bilaterally: hip flexion: 2/5; hip abduction: 3/5; hip adduction: 3/5; knee extension: 3/5; knee flexion: 2/5; ankle dorsiflexion 2/5

Tone: MAS is 1 on bilateral adductors, gastrocnemius and hamstrings. Balance: She is able to maintain static standing with both knee immobilizers donned and AFOs for 5 seconds without bilateral upper limb support; completely able to stand with Upper limb support.

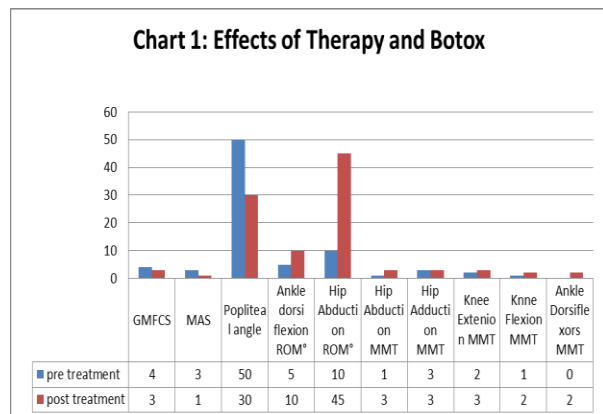
GMFCS is now on level III. Range of motion measured with goniometer of ankle dorsiflexion 10 degree, popliteal angle improved to 30 degree and hip abduction 45 degrees.



Figure 2: posture of patient on day one in OPD. Observe scissoring hip adductors and equines feet. Picture courtesy: Liaquat National Hospital, Department of Physiotherapy, Peads Rehabilitation Unit, Dr. Noureen Fatima.

DICUSSION:

Refer to chart 1, here improvement has been observed after botox and extensive physiotherapy plan. As one can see GMFCS has been improved from level IV to level III. Hypertonicity has been measured by modified ashworth scale and the chart shows improvement from 3 to 1. Popliteal angle improved from 50° to 30°. Range of motion at hip and ankle level has been observed and so muscle power also increased after treatment.



CONCLUSION:

Cerebral palsy disorder is not having cure, but through exercises and other interventions like baclofen and botox we can improve quality of life (QOL) and prevent deformities and contractures. CP children are specially abled and through early and right intervention small improvements can occur which ultimately provide major benefits in the form of developing skills. Once, it was believed that neurons do not repair but now due to the concept of neuroplasticity that is also encourage by Bobath says that CNS have the ability to renovate their neurons by axonal sprouting to take over the function of damaged neurons (Pascual-Leone A, 2005). Improvement in this patient also supports the concept of Neuroplasticity. After the analysis of this patient’s parameters it can be concluded that multiple techniques of physiotherapy like Bobath, Roods approach components, Play based therapy, stretching exercises and orthotics support are beneficial in patients with intramuscular Botox injections.

Abbreviations:

- MMT= Manual Muscle Testing
- QOL=Quality of Life
- ADL= Activities of daily living
- ROM= Range of motion
- MAS= Modified ashworth scale.
- GMFCS=Gross motor function classification system

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