



Effect of MFR to Reduce Elbow Flexor Spasticity in Children with Cerebral Palsy: A single Case Study

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Abstract:

Purpose : To find out the effectiveness of Myofascial Release along with conventional physiotherapy on spasticity of elbow flexor muscles in cerebral Palsy subjects.

Methodology: A 2yr 4-month-old male child with spastic cerebral Palsy was included in the study. AB case design was used. It consisted of a baseline phase (A) and an intervention phase (B). Baseline and Post treatment measures were Modified Ashworth Scale (MAS) and Besta scale. During intervention phase, Myofascial Release technique was used in elbow flexor muscles along with conventional therapy 5 days a week for 4 weeks.

Results: The results of the study showed beneficial effect of MFR along with conventional physiotherapy in the child with cerebral palsy.

Conclusion : It can be concluded from our study that the MFR along with conventional treatment reduces spasticity in elbow flexor muscles and improves arm function in cerebral Palsy

Key Words: Spasticity, Myofascial Release Technique (MFR).

1. INTRODUCTION:

Cerebral Palsy is a group of permanent disorders of the development of the movement and posture which causes activity limitation. This term is characterized by motor dysfunction due to non-progressive brain damage early in life.[1] Cerebral palsy is leading cause of childhood disability. The incidence of cerebral palsy is approximately 2 to 3 cases per 1000 live births from around the world.[1] In Cerebral Palsy the lesion in the central nervous system frequently results in spasticity of various muscle groups. Spasticity results from alteration within the balance of inputs from reticulospinal and other descending pathways to the motor and interneural circuits of the spinal cord. When the muscle is stretched, the primary afferent fibres that provide the intrafusal fibres of the muscle spindle gets excited and this triggers the monosynaptic excitatory connection with the α motor neuron which supply the stretched muscle and results in contraction of the stretched muscle and excitatory connections with α motor neuron that supplies synergistic muscle. [2] Myofascial therapy will be defined as the facilitation of mechanical, neural and psycho, physiological adaptive potential as interfaced by the myofascial system.[1][3] The aim of deep myofascial release is to release restrictions or the barriers within the deeper layers of fascia. This is often released by a stretching of the muscular elastic components of the fascia.[3] Myofascial Release (MFR) techniques focus on working through the restrictions within the fascial system, which supports structures of the body. Myofascial Release (MFR) techniques are utilized in a broad range of settings and diagnoses like pain, movement restriction, spasm, spasticity, neurological dysfunction like cerebral palsy, head and birth injury, Cardiovascular Accidents (CVA). [1]

Neurodevelopmental Therapy is hands-on, 'problem solving approach which is employed within the management and treatment of children who have disorders of function, movement or postural control because of damage in their central nervous system. The techniques utilized in facilitation or inhibition of postural reactions and control are guided to supply more movement strategies and graded control.[4]

A child with spastic quadriplegia will have more severe global problem of upper limb spasticity making any function or even hygiene difficult. Simpler hand activities such as grasping and releasing are also difficult. Also, cerebral palsy is the result of early brain damage, including brain malformations, periventricular brain lesions, middle cerebral artery infarctions and non progressive postnatal brain injuries which is resulting in movement impairments are largely lateralized to one side, which the upper extremity usually being affected more than the lower extremity. Often the



integrity of the motor cortex and corticospinal pathways necessary for precision grasping and fine control of the fingers and hand, are compromised. Consequently, skilled independent finger movements and hand skills do not develop normally.[4]

All of these techniques are useful to reduce spasticity and improve the function in children with cerebral palsy. But studies till now concentrated on the short-term effect of myofascial release technique to reduce spasticity in lower extremity muscles. Being short term in nature, these does not take into consideration the effect of MFR to reduce spasticity. Also, more of the studies are done to reduce spasticity of lower extremity muscles but there is lack of studies to reduce spasticity in elbow flexor muscle and improve hand function in cerebral palsy patient.

2. MATERIALS & METHODOLOGY:

A 2yr 4 month old male child with spastic cerebral Palsy was included in the study. AB case design was used. It consisted of a baseline phase (A) and an intervention phase (B). The independent variable was the intervention which is the MFR for elbow flexor muscles and the Dependent variable was the elbow flexor Spasticity, for which the outcome measure we used is Modified Ashworth Scale. A consent form was signed by the parent before assessing the patient. The complete neurological Paediatric physiotherapy assessment was performed and through that it was analysed that spasticity was present on elbow flexor muscle and the child had difficulty performing gross and fine motor functions. Before intervention was given Baseline variable (A) was measured. For Spasticity, Modified Ashworth scale was used and to check the performance and capacity of hand, Besta Scale was performed.

Therapy was given for 5 days a week for 4 weeks, which consisted of MFR technique for elbow flexor muscles along with Conventional Therapy.

MFR for elbow flexors -MFR for flexors was given with patient in supine position with crossed hands or with thumb. Baby Lotion was used to reduce the friction. Then myofascial structures were stretched and then it was held for 120 seconds to allow the tissue to soften.

After the intervention phase (B) post-test measurements were taken using Modified Ashworth Scale and Besta Scale.

Pre- Test	Post-Test
Grade 1+	Grade 1



Table 1: Modified Ashworth Scale

Fig 1: MFR for Elbow flexor muscles

Besta Scale	Pre - test	Post test
Global Score A	4	8
Global Score B	1	6
Global Score C	0	3

Table 2: Besta Scale

3. DISCUSSION & RESULT:

The present case study was carried out to evaluate the effectiveness of myofascial release technique along with conventional physiotherapy technique to reduce spasticity and improve hand function in child with cerebral palsy. The results of the study showed beneficial effect of MFR and conventional physiotherapy technique in the child with cerebral palsy.



There was reduction in spasticity seen in elbow flexor muscle after the 4 weeks of treatment. The main mechanism for results basically deals with neuroreflexive change that happens within the application of manual force on the musculoskeletal system while giving Myofascial release. It's a hands-on approach which offers afferent stimulation through receptors and provides response by central processing at the spinal cord and cortical levels. Thus, afferent stimulation frequently leads to in efferent inhibition. This principal is employed in Myofascial release technique when the afferent stimulation of a stretch is applied and therefore the operator waits for efferent inhibition to occur so relaxation results. [1][5]

In the current study, there was improvement was seen through stretching also. Basically, reduction in spasticity suggest that an exaggerated stretch reflex is that the characteristic of muscle spasticity and is primarily due to increased α motor neuron excitability. Stretching results in increase the extensibility of soft tissues by mechanism that involves viscous deformation and structural adaptations of muscles and soft tissues. The structures which are put under tension are muscle, tendon, connective tissues, vascular, dermal and neural tissue. [6]

Also, the current study showed beneficial effect on improving hand function. Two principles with particular application to hand skill development are the development of movement patterns from mass to specific and of motor control from proximal to distal. The mass to specific principle of development means that less differentiated movement patterns precede discrete, highly specialized skills. Proximal-to-distal sequencing is a ubiquitous coordination pattern that has been observed in both upper and lower limb segments, it means proximal muscle gets activated first followed by distal muscles. [8][9][10]

4. CONCLUSION :

The study suggests that myofascial release technique along with conventional therapy has shown to reduce elbow flexor spasticity and improve hand function in Spastic Cerebral Palsy Child.

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