Journal of Palliative Care & Medicine
ISSN: 2165-7386

Bhatikar, J Palliat Care Med 2019, 9:1
DOI: 10.4172/2165-7386.1000349

Case Report Open Access

Effect of Matrix Rhythm Therapy in B/L Adductor Muscle Tightness in Pediatric Cerebral Palsy: A Case Report

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Received date: October 15, 2018; **Accepted date:** November 30, 2018; **Published date:** December 07, 2018

Abstract

Spastic cerebral palsy is the most common form of neurological disorder in pediatric age. Tightness in muscles causes decreased the range of motion and limited joint mobility. In the present study, a 14-year old patient with bilateral lowers limb spasticity was addressed. There are different physical therapies and modalities used in the treatment of muscle tightness caused by cerebral palsy but have not shown satisfactory results. Though stretching and other physical conventional therapies have shown some effect on spasticity, no studies have resent and long-term effects. Matrix rhythm therapy is an advanced physical therapeutic modality that works in muscle relaxing and healing. No strong evidence has been studied for its effect on spasticity. Hence the aim of the present study was to evaluate the effect of the Matrix Rhythm Therapy in B/L (Bilateral) Adductor muscle tightness in pediatric cerebral palsy. After completion of the study, it can be concluded that matrix rhythm therapy may show great effects in decreasing spasticity when used with other conventional physical therapy.

Keywords: Matrix rhythm therapy; Spastic cerebral palsy; Conventional physical therapy

Introduction

Cerebral palsy describes a group of chronic disorders that impair a person's ability to control body movement and posture, occurs in two to six of every 1,000 births. There are many types of cerebral palsy from which spastic cerebral palsy is the most common form and is the types seen in 75 to 80 percent of cases [1].

Spasticity is a common symptom observed following upper motor neuron syndrome. Spasticity due to neurological disorders like cerebral palsy results from significantly increased muscle tone and muscle tightness, limiting movement and joint mobility. Tight muscles cause decreased range of motion and limited joint mobility. This leads to abnormal gait commonly seen is scissoring gait, with 1 foot crossing in front of the other with each step.

There are different physical therapies and modalities used in the treatment of muscle tightness caused by cerebral palsy but have not shown satisfactory results. Bilateral adductor tightness also influences the calf muscle, pulling the toes down toward the floor and lifting the heel off the ground is affected. Most commonly used techniques are passive stretching [2]. Passive stretching uses an external force applied by the therapist to stretch the tight muscles. This should not be painful and overstretching can lead to muscle damage. This stretch position is held for approximately 30 seconds and repeated several times to maintain the length.

According to Physical Medicine & Rehabilitation Clinics of North America, passive stretching alone is not effective for long-term improvement in muscle tightness for children with cerebral palsy [3]. Though the passive stretching continues to be a common among the longstanding component of physical therapy programs, research has failed to prove its long-term effectiveness.

Passive stretching combined with active exercise had also shown little benefit in improving muscle strength. There is no specific split used that have shown benefit in adductor muscle tightness. Hence we have to search for newer resent in physical modalities or techniques that may show results in the long-term effect on muscle tightness.

Reliable and valid tools must be used must be used for the assessing spasticity accurately in clinical practice and for research purposes. The results of several studies have demonstrated that interrater and intrarater reliability of the Modified Ashworth Scale have stated that the repetition of measurements by the same physiotherapist and experience may not affect the reliability of Modified Ashworth Scale [4].

The Bohannon-Smith Modified Ashworth Scale (MAS) has been recently modified and is an ordinal level measure of spasticity, which grades the intensity of spasticity from 0 to 4. Recent studies on the Modified Modified Ashworth Scale (MMAS) are a reliable measure for assessing spasticity in either upper or lower limbs of patients with spasticity. Hence, in the present study, we used the Modified Ashworth Scale to record the baseline data of the study [5].

Matrix Rhythm Therapy is a basic kind of therapy method to maintain the body's good health (prevention) and to support the healing of muscular-skeletal problems, post-operatively as well as rehabilitative. The deficient energy metabolism at the cellular level during disease must be normalized before any adequate therapies. Matrix rhythm therapy the cellular metabolism can be rehabilitated before subsequent macroscopic exercises which will move and train the muscles. It also helps in healing pain and re-adaptation of shifted dynamic equilibrium on a cell biological level and this healing must be activated at cellular level [6].

Case Report

A 14-year old boy was presented to our clinic with the complaint of difficulty in walking. He was born at full term through normal vaginal delivery. He had delayed birth cry. The birth weight was normal. He had delayed developmental motor milestones and gradually increasing head circumference till the age of 1 year. Now he presented with tightness in both the upper and lower limbs (more in lower limbs). On examination, he had diffuse spasticity in both the lower limbs; spasticity grades according to MAS (Modified Ashworth Scale) in the hip adductors and knee flexors were 2 and 2 respectively on both the sides as shown in Figure 1.

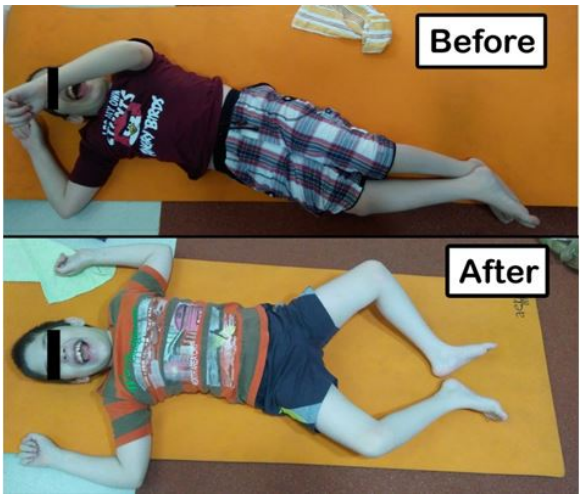

Figure 1: Change in B/L Adductor extensibility

Bilateral adductor was equal to 2 and the difference between the two knees in knee flexed supine position with hip stabilized was 08 inches. He had scissoring with equine gait. Patient's mother also gave the history of continues physiotherapy for last 5 years but there was no improvement in adductor tightness. The patient had undergone many active and passive physical therapy techniques and orthotics. The patient so visited our clinic. Here the patient was reassessed and the study was explained in their vernacular language to the patient's parents and caregivers.

In the study matric rhythm therapy was applied for 45 minutes for the hip region and both the adductor muscles. Matrix rhythm therapy was given for the alternate sessions. The patient was then given active assessed stretching and other conventional exercises of the therapy session. Baseline data were recorded at the assessment session, 3 and 6 weeks of the session as tabulated in Table 1.

Parameters	On assessment	3rd week	6th week
Modified Ashworth Scale Rr Adductor (stabilizing Lt)	2	1	1
Modified Ashworth Scale Lt Adductor (stabilizing Rt)	2	1	1
Between knee distance with hip and heel stabilization (inch)	8	11.5	16.2

Table 1: Result Data

Discussion

In the present study, we gave matrix rhythm therapy for the bilateral adductor muscles. Matrix rhythm therapy has proved the significant increase in peripheral blood flow of hamstring and triceps surae muscle of left lower extremity in young females when compared with the effects of massage [7]. It is also known to promote the normal physiologic logistics at the intercellular and extracellular level by maintaining the normal pH of the tissues by micro mobilization using the applicator. Other studies have evidence that promotes improved microcirculation within the tissues which give the basis of enhanced removal of metabolic waste products, reduction in edema and improving extensibility of soft tissues [8].

Matrix rhythm therapy delivers physiological rhythmic oscillations between 8-12 Hz that synchronizes with internal body rhythm to improved micro-circulation and improved oxygen supply that produces repolarization leading to relaxation of skeletal muscle [6]. In a study, it was shown that there was an increase in the passive ROM (Rang of Motion) which could be a result of the micro-stretching characteristic of the treatment on the scar tissue. In the study, the pressure sensor was measured pre and post treatment and optimistic results were found in the MRT (Matrix Rhythm Therapy) group than in the other conventional therapy group. Matrix rhythm therapy showed the positive effect on the sensory function which could be due to a rebalancing of the cellular micro-processes upon which cell regeneration and cellular healing depends [10]. Another reason for the release of muscle contraction by matrix rhythm therapy is due to its work to improve the tissue extensibility, and also the circulation. As a result of hypoxia or an energy deficit on the cellular level, the muscles fibers become contracted in spasticity and the fibers are no longer available for active motion. The variability in the motion pattern is restricted which with Matrix rhythm therapy is thought to increase the ROM, induce relaxation, modulate pain and reduces soft tissue swelling and inflammation [6].

Following matrix rhythm therapy active stretching and other conventional exercises were applied to maintain the gained muscle length. Other conventional therapies included Adductor stretching and strengthening protocol, passive neuromuscular facilitatory techniques and standing on a standing frame with knee spacing. This has also helped in maintaining the muscle length, strength and improving joint range as results supported. By the present study, we can conclude that the matrix rhythm therapy may increase the extensibility of a spastic muscle that can be further managed by the actively assisted stretching and other conventional therapies.

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