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Case Report

Exercise Rehabilitation Program for Children with Congenital Muscular Torticollis

SJM Ummul Ambia*

Lecturer, Rehabilitation Science, Bangladesh Health Professions Institute (BHPI), Centre for the Rehabilitation of Paralysed (CRP), Bangladesh

***Corresponding Author:** SJM Ummul Ambia, Lecturer, Rehabilitation Science, Bangladesh Health Professions Institute (BHPI), Centre for the Rehabilitation of Paralysed (CRP), Bangladesh.

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Abstract

Objective: The study was emphasis an exercise rehabilitation program for children with Congenital Muscular Torticollis (CMT).

Materials and Methods: This were a case study to review the protocol of treatment of CMT and set an exercise rehabilitation program for children with CMT. The case was a typical case of CMT that was identified though a vast assessment. The objective analysis would preface a valid measurement tool that is Baseline Large Joint Arthrodial Goniometer. Then priorities the problem list that mainly focus on structural and functional dysfunction. The secondary complications also focus as state. In the study the impact of physical function of untreated CMT make a center of attention. The essential considering issues for treating CMT would address for set the rehabilitation goal easier. The rehabilitation protocol for CMT be contingent on the parents or caregiver education along with range of motion exercises which includes neck and trunk as well emphasis on symmetrical movement and overall, the environmental adaptations.

Study Period: The case was taken from CRP Savar, Dhaka, Bangladesh at the year 2015 data base.

Conclusion: The case reported that the child with CMT had showed typical physical problems, so the exercise diversity in the frequency of interventions utilized was observed. Parental education and understanding were identified as very important issues during exercise rehabilitation program. The literature search did not find any established home exercise protocol for CMT. So, exercise is varying from child to child and the exercise program also dependents upon the child's home environment.

Keywords: *Congenital Muscular Torticollis; Exercise Rehabilitation*

Introduction

The term Congenital muscular torticollis (CMT) refers to the articulated meaning twisted neck, which is a painless congenital deformity showed the lateral leaning of the head to shoulder due to unilateral shortening of neck muscle (sternocleidomastoid). The condition common in 0.3 - 1.9% of all live births which could be noticed within 4 to 8 weeks of the infant [1,2].

The general symptom of infant with CMT shows asymmetrical head posture of lateral flexion to the affected side with ipsilateral head tilt and contralateral rotation of the face and chin. The progressive limitation of neck movement with craniofacial asymmetry, plagiocephaly and compensatory scoliosis. Which may lead to delayed development of the motor milestones or functional asymmetry as a secondary complication [3]. Initially typical CMT case cured by continuous physiotherapy treatment, surgical option prefers in worse case such as severely shorted of sternocleidomastoid muscle [3,4].

Case Report

Neck stiffness and restricted head mobility were reported by a 6-month-old male child. A right-side head tilt with a left-side chin deviation was discovered throughout the test. The neck movement was severely restricted, particularly in lateral rotation. There was no asym-

metry in the face. The right Sternocleidomastoid (SCM) muscle was sensitive, tense, and cord-like when palpated. A lump or mass might be felt running the length of the muscle. The cervical spine, hips, and lower extremities all had normal radiographs. There was no evidence of a neurological or ophthalmologic disability. A clinical diagnosis of CMT was established based on the previous findings. Although early conservative intervention is recommended for newborns with CMT, there is no exact guideline to guide physiotherapy practice. The physiotherapy management of this patient could potentially differ. A review of the literature indicated that no previous studies had looked into current physiotherapy techniques and/or perceived limits in the management of newborns with CMT. The study goal was to outline current exercise rehabilitation challenges in the management of newborns with CMT. This had been accomplished in part by extensively observing existing physiotherapy practice in CMT patients.

The initial assessment of child with CMT

The below components need to be clarified before started any exercise program for a certain patient. Those are the common considerable components for a child with CMT [5].

Physiotherapy examination components for children with CMT	
Parent Report of History	• Birth/delivery • Length of infant at birth • Presence of skull asymmetry at birth • Presence of facial asymmetry at birth
Current Health	• Feeding • Positioning • Devices used
Torticollis/Plagiocephaly History	• Onset • Changes in symptoms
Systems Review	
Visual Function	• Midline visual focus • Ocular alignment
Hip Screen	• Asymmetry • Hip clunk • Leg length discrepancy
Neurological Screen	• Predominant Asymmetrical Tonic Neck Reflex (ATNR) • Abnormal muscle tone • Presence of sustained clonus
Pain Assessment	• Appropriate pain scale
Skin Screen	• Clinical appearance of neck
Physical Assessment	
Clinical Observations	• Resting posture • Motor development
Plagiocephaly/Anthropometrics	• Cranial shape type
Range of Motion	• Cervical • Upper and lower extremity
Palpation	• Sternocleidomastoid • Trapezius • Scalenes

Table 1

The primary problem of children with CMT

In the case after document the initial examination and evaluation of 6 months old child with suspected or diagnosed CMT for the following body structures [6]:

- Pain or discomfort during passive and active movement of neck on the affected side.
- A mass on neck muscle.

- Abnormal head shape.
- Posture and tolerance of positioning in supine, prone, sitting and standing for body symmetry with or without support, as appropriate for age.
- Range of motion (active and passive) restriction on neck, trunk and upper extremities.
- Unable to maintain midline alignment to do functional movement.
- The child has diminished homolateral neck rotation, flexion and heterolateral extension.

Other characteristics:

- Curvatures of the thoracic spine in the sagittal plane, with the concavity towards CMT;
- Resistance of the asymmetrical tonic neck reflex (ATNR);
- Asymmetric positioning of the pelvis: when the facial side of the hip is in abduction, the occipital side is adducted [4].

Secondary problems of children with CMT

The child with CMT has:

- Permanent asymmetry of head movements;
- Asymmetry of primitive reflexes;
- It uses homolateral hand less;
- Homolateral visual field shrinks;
- There are asymmetries in rolling, crawling, walking; incomplete development of automatic postural reactions;
- Persistence of postural asymmetry leads to structural deformations such as: pelvic obliquity and scoliosis.

In extreme cases the child will behave like a paralyzed person, having difficulty in: keeping a weight in the homolateral upper limb (UL); midline extension and supination of the forearm; using the upper limb in defense and balance reactions.

Besides limited the cervical movements other affections manifest themselves, too:

- Sensory systems (vision and the vestibular function),
- Postural organization,
- Orientation and body schema.

The motor development stages evolve atypically, since the subsystems (visual, vestibular, somatosensory and musculoskeletal) develop asymmetrically [7].

The impact of physical function of children with CMT

The below flow chart presented the impact of physical function for children with CMT.

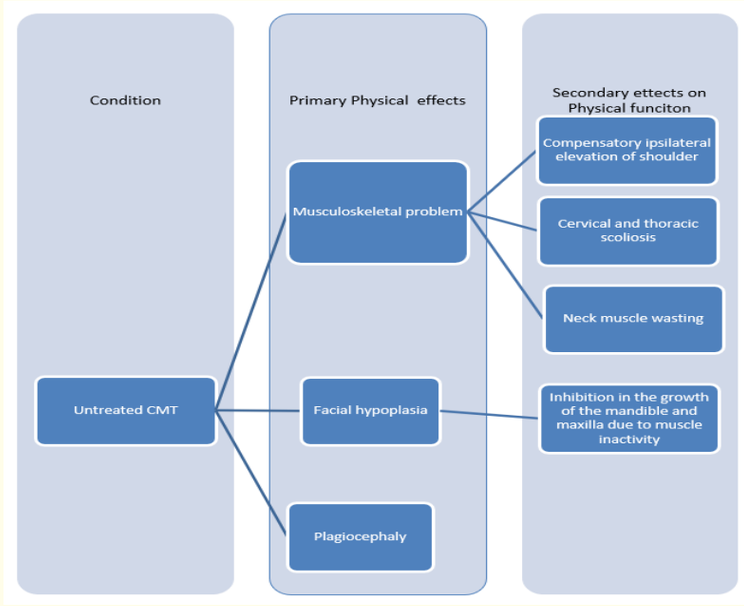

Figure 1

Literature showed some vital facts such as age of the child, level of severity, level of neuromuscular involvement and parents or caregivers' ability to follow advice need to be consider before starting the treatment of CMT and prevent the secondary complications [2,3].

Essential considering issues to make an exercise rehabilitation plan for CMT are give in the below table.

For children with CMT	For parents or Caregivers	Risk, Harm, and Cost
• Increase children functional active movement. • Prevents/reduces,/eliminates asymmetrical postural. • Decrease external support.	• Active and effective caregivers. • Regular follow up for physiotherapy • Follow the home advice to understand the factors that contribute to asymmetry. • Compare the child with the typical developmental milestones.	• Stretching may or may not cause temporary infant discomfort • Cost of care may be a load for families. • Parents/caregivers may apply interventions incorrectly. • Parents might ease up on home exercises if they perceive that the therapist is implementing the treatment [2].

Table 2

Measurement tool for CMT

Baseline Large Joint Arthrodial Goniometer is a measurement tool within 180-degree opposing scales that measure joint movement in 5-degree increments for CMT prognosis which is a horizontal protractor provides for measuring patient head turn in a transverse plane of the body. It is a combination of the vertical and horizontal protractors provide simultaneous measurement of either head turn or head bend or head turn and head tilt. The measurement tool intended to work on measure the range of motion of neck, head righting reactions examination and observance of the head and facial asymmetries to confirm about plagiocephaly [8].

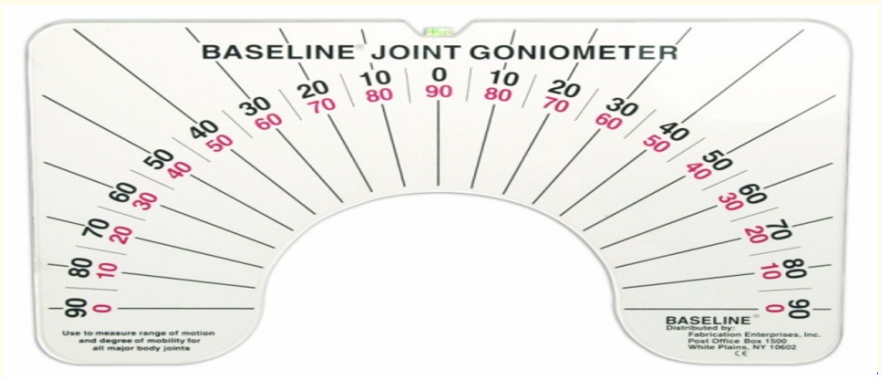

Figure 2

Effective exercise program for CMT

Provide the following 5 components as the first-choice intervention. The Physiotherapist plan of care for the case with CMT should minimally address these 5 components:

- Neck passive range of motion (PROM).
- Neck and trunk active ROM.
- Development of symmetrical movement.
- Environmental adaptations.
- Parent/caregiver education [7,9].

Effective exercise program for CMT

Type of exercise	Regularity	Concentration	Clinical reasoning
Manual passive slow stretching on neck: • Stretching as an intervention should not be painful. • Stretches should be stopped if the infant resists.	There is a trend that more frequent intervention throughout the day, every day, results in more rapid resolution of symptoms.	The protocol recommended intensity range from 10 to 30 seconds and one report describing progressive tolerance developing for up to 2 to 3 minutes.	Stretched the shortened neck (SCM) muscle to a flexible range.
Active rotation of neck and trunk of the child with CMT	Every single time of the child with CMT: • Positioning • Handling • Carrying and • Feeding time	As long as possible or dependents upon the child's tolerance	Incorporating righting reactions in upright postures, rolling, side lying, or sitting has been used effectively during treatment and daily care routines to strengthen muscles opposite of the affected muscles
Development of symmetrical movement during	Weight bearing through: • Prone lying • Crowing • Sitting time	As long as possible or dependents upon the child's tolerance	Developmental exercises should be incorporated into exercise program to promote symmetrical movement.
Environmental adaptation: • Adaptations to the infant's environment can be incorporated into the home exercise program.	Placing toys on the affected side for the infant to turn the head toward the tighter side: • Every playing times • Usually, child play most of the time so as much as possible	Have recommended as the home programming	Alternating the infant's position in the crib and changing table encourages head turning in the desired direction.
Parents or care giver education: • Tummy time or prone playing. • Symmetrical positioning during carrying • Alternative feeding position.	These strategies should be integrated into the daily routines	Have recommended as the home programming.	Parents or care giver should have the best handling to control the child and maintain a normal symmetrical position of the child's neck.
Refer for consultation when outcomes are not fully achieved: • If the head, neck, and trunk are not resolving after 4 to 6 weeks of initial intense treatment; • If after 6 months of treatment with only moderate resolution; • If the infant is older than 7 months on initial examination and a tight band or SCM mass is present; or if the side of torticollis changes [9].			
Discharge and follow-up of infants with CMT: When the infant has full passive ROM within 5° of the non-affected side, symmetrical active movement patterns throughout the passive range, age-appropriate motor development, no visible head tilt, and the parents/caregivers understand what to monitor as the child grows.			
Provide a follow-up screening of the infant 3 to 12 months post-discharge from exercise intervention or when the child initiates walking [7].			

Table 3

Parent education is key to success of exercise rehabilitation for the children with CMT

- Orientation of different body position into the child's daily routine include carrying, sleeping, playing and feeding according to the home advice.
- Regular follow up the gains in ROM, postural symmetry and meeting gross motor milestones.
- Parents or caregiver are encouraged to look for any regression observed in this population until 3 years of age.
- As the infant gains' strength in neck and trunk musculature, the caregivers are taught strengthening exercises that use age-appropriate balance responses and transitions. The caregivers are taught infant massage and handling that will help to promote balanced, healthy tissues and somatosensory development [11,12].

Conclusion

The case reported that the child with CMT had showed typical physical problems, so the exercise diversity in the frequency of interventions utilized was observed. Parental education and understanding were identified as very important issues during exercise rehabilitation program. The literature search did not find any established home exercise protocol for CMT. So, exercise is varying from child to child and the exercise program also dependents upon the child's home environment. Parental education and understanding were identified as issues during exercise rehabilitation program. The literature search did not find any established home exercise protocol for CMT. So, exercise is varying from child to child and the exercise program also dependents upon the child's home environment.

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