International Journal of Physiotherapy and Research,
Int J Physiother Res 2015, Vol 3(3):1032-36. ISSN 2321-1822
DOI: http://dx.doi.org/10.16965/ijpr.2015.129

Case Report

EFFECTIVENESS OF CRANIO-CERVICAL TRAINING OVER MYOFACIAL PAIN SYNDROME: A CASE STUDY

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ABSTRACT

Background and Purpose: Myofascial pain syndrome (MPS) is a syndrome presenting with acute or chronic regional pain originating from trigger points (TPs) localized in the muscles or the fascia. TPs are local points showing high irritability, sensitivity to finger pressure and causing characteristic referred pain. The aim of this case study is to assess the effectiveness of cranio-cervical training on neck disability, endurance of deep cervical muscles and pressure pain threshold in a patient with cervical myofascial pain syndrome.
Case description: A 36 year old female who was diagnosed with myofascial pain syndrome. She received cranio cervical training, a low load endurance exercises in order to train and/or to regain muscle control of the cervicoscapular and craniocervical regions. The patient received the treatment program for 10 to 15 minutes. The frequency of treatment is five days in a week for a period of 3 weeks.
Outcome: The outcome measures were neck disability index, pressure pain threshold and deep cervical endurance test, which were measured prior to treatment and at the end of third week.
Conclusion: The craniocervical training programme for a patient with myofascial pain syndrome found to be effective in reducing neck disability, improving the pressure pain threshold and deep cervical flexor muscle endurance.
KEY WORDS: Myofascial Pain Syndrome, Cranio Cervical Training, Neck disability Index, Pressure Pain threshold, Deep Cervical Endurance Test.

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Access this Article online

Quick Response code

DOI: 10.16965/ijpr.2015.129

International Journal of Physiotherapy and Research
ISSN 2321- 1822
www.ijmhr.org/ijpr.html

Received: 28-03-2015	Accepted: 27-04-2015
Peer Review: 28-03-2015	Published (O): 11-06-2015
Revised: 16-04-2015	Published (P): 11-06-2015

INTRODUCTION

Myofascial pain syndrome is one of the common musculoskeletal pain disorders which affects almost 95% of people with chronic pain disorders and is a common finding in specially pain management centre [1,2,3]. It is a syndrome presenting with acute or chronic regional pain originating from trigger points (TPs) localized in the muscles or the fascia. [2,4,5,6,7,8] TPs are local points showing high irritability, sensitivity to finger pressure and causing characteristic referred pain. Autonomic phenomena, fatigue, anxiety and depression often accompany this syndrome [2,4].

Although, the etiology of TPs development is currently unknown, the studies have hypothesized that the pathogenesis results from the overloading and injury of muscle tissue, leading to involuntary shortening of localized fibers [9,10]. Myofascial pain syndrome also occurs due to poor posture, overuse, acute

trauma, vitamin deficiency and psychological stress [9]. The authors have found that the trapezius is probably the muscle most often beset by myofascial trigger point. It is a frequently overlooked as the source of temporal & cervicogenic headache. The upper trapezius trigger point consistently refers pain along with the postero lateral aspect of neck to mastoid process and was the major source of tension neck ache. When pain is referred from myofascial trigger point in other muscles such as sternocleidomastoid, suboccipital and temporalis, it overlaps to result in tension headache [2]. Further, literature has demonstrated that patients with myofascial pain had significantly less strength and endurance of the deep neck flexors compared to age-matched control [11]. A muscle with trigger points may not fully lengthen or shorten and for that reason it will have diminished muscle strength and endurance and will fatigue easily [12].

Numerous treatment options targeting at the trigger points are available such as LASER, trigger point injection, spray and stretch method, dry needling, ultrasound, TENS, trigger point pressure release (TrPPR)/ischemic compression (direct inhibitory pressure), muscle energy technique (MET), myofascial release therapy (MRT), positional release therapy (PRT) i.e. strain counter strain technique and integrated neuromuscular inhibitory technique (INIT)[13,14]. In addition it has been found the efficacy of Upper cervical flexor strengthening in reducing pain & disability in upper trapezius trigger point patients [15]. The purpose of Upper cervical flexor strengthening is to increase muscle strength/ power, therefore the exercises are performed with high load, less repetition, whereas craniocervical training is performed with low load for prolonged period of time. However, no previous trial has investigated the effect of craniocervical training in myofascial pain syndrome. Cranio-cervical training is a simple & easy way to increase endurance of deep cervical flexors.

Thus, the aim of present case study is to assess the effectiveness of cranio-cervical training (a low load training program for deep cervical flexors) on neck disability, endurance of deep cervical muscles and pressure pain threshold in a patient with cervical myofascial pain syndrome.

Case Description:

Patient history and System review: A 36-year-old, right handed female presented with complaints of posterior and lateral neck pain. She described pain symptoms as continuous, which aggravates while doing clerical work in her office. There was no previous history of such symptoms, nor any other muscular or skeletal conditions. The patient appeared to be within healthy weight parameters, and had experienced no recent, unusual weight gain or loss. She had no history of trauma or blunt force impact that could be linked with the onset of symptoms.

The patient stated that her symptoms began more than a month ago, during a time when she spent long periods of desk job at her office. She reported that her symptoms had been gradually worsened during the course of the previous one month. The patient initially consulted her family physician in order to rule out possible pathological or systemic causes. A series of blood and urine tests were performed which reportedly all proved to be within normal limits. The physician diagnosed the problem as myofascial pain syndrome and she was then referred to a Physiotherapist. Since then she was taking treatment at physiotherapy OPD, Punjabi University. A informed consent was taken from the patient and the case study was performed.

Examination: Postural evaluation demonstrated forward head posture, bilateral protracted and rounded shoulders. Cervical ranges of motion indicated reduced flexion, with right and left rotation decreased by 20% and lateral flexion reduced by 20%. The manual muscle testing of deep cervical flexor muscles was found to be fair. [16] Further reduced flexibility in bilateral pectoralis major & minor and in suboccipital muscles was evident. Neurological evaluation of both upper and lower extremities was unremarkable i.e., Deep tendon reflexes were 2+ (symmetric) and sensory response (pin prick & gentle touch) was normal.

Evaluation of the cervical spine revealed moderate myofascial pain in the para-vertebral

musculature. Deep tissue palpation of the upper trapezius muscle bilaterally indicated presence of multiple trigger points, which referred pain to the sub-occipital area when provoked.

Palpation of the suboccipital, bilateral levator scapular muscles also indicated the presence of myofascial trigger points. Passive accessory spinal motion was checked by applying central postero-anterior pressure and lateral postero-anterior pressure on all the cervical spines processes and facet joints respectively and joint play was found to be reduced. This clinical examination also reconfirmed the physician diagnosis.

Further examination included assessment of neck pain and disability using Neck Disability Index (NDI) score. The NDI questionnaire consisted 10 sections, (each section grades from 0 to 5) with questions pertaining to feedback of the subjects regarding their pain, ability to do activities of daily living, ability to concentrate and presence of headaches. The scale consisted of discrete categories within which each item was weighted and responses were summed up, divided by total score which is 50 and its percentage was taken. NDI had a high degree of reliability and internal consistency [17].

The cervical flexor muscle endurance was assessed with the patient is in crook lying position and hands resting on the abdomen. Patient was instructed to maximally tuck in the chin and maintain the position isometrically, leading to lifting of the head and neck approximately 2.5 cm from resting position. While in this position a line was drawn across 2 approximated skin folds along the anterolateral neck. The time between assuming the test position until the chin begins to thrust or the edges of the drawn lines across the skin folds no longer approximate each other (because of loss of chin tuck) was measured in seconds with a stopwatch [18]. Three consecutive measurement at an interval of 30 seconds were taken and average was obtained. The test used is a valid and reliable measure of deep neck flexor endurance [19,20].

For measuring Pressure Pain Threshold (PPT), a mechanical pressure algometer was used [21,22]. This device consists of a round rubber disk (area, 1 cm^2) attached to a pressure (force) gauge. The gauge displays values in kilograms. Because the surface of the rubber tip is 1 cm^2, the readings are expressed in kilograms per square centimeter. Average value was obtained following three consecutive measurements of PPT levels on the upper trapezius (as shown in Figure 1), Sub occipital and Levator scapulae muscles Tps, each at interval of 30 seconds.

Fig. 1: Pressure Pain Threshold Measurement Using Pressure Algometer Over Upper Tapezius Trigger Point.

Treatment: The Craniocervical Training Programme (CTP) was a new developed programme using low-load endurance exercises in order to train and/or to regain muscle control of the cervicoscapular and craniocervical regions [23]. To address the impairment in neck flexor synergy found in cervicogenic headache and other neck pain disorders [24,25], craniocervical flexion exercises were performed, using a latex band (Thera-Band®, Resistive Exercise Systems; blue colour-coded level of progressive resistance). The 150-cm latex band was used as a circular band, with one side positioned at the craniocervical region of the patient's neck and the other side fixed somewhat above the horizontal. The resistance of the band was used in such a way that it facilitated the longus colli muscles [26]. Exercises were performed in a sitting position with a natural lumbar lordosis, with slight scapular retraction & adduction and by slightly elongating the cervical spine as shown in Figure 2 and 3. Two sets of 12 repetitions each were performed (20 seconds hold time and 10 seconds rest time). Rest period between each set was 30 seconds and CTP part of treatment session lasts for 15 minutes. The patient was advised to perform the exercises twice at home. Hot pack was applied at the neck for 15 minutes. In addition to the CTP, information regarding postural awareness and ergonomic advices for home and at

workplace were also provided.

Fig. 2: Craniocervical Training Starting Position.

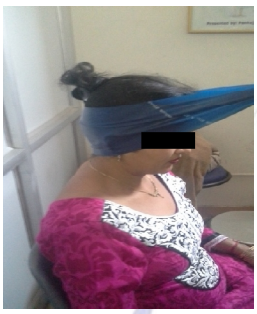

Fig. 3: Craniocervical Training End Position.

Outcomes:

The patient was treated for a period of three weeks (5 sessions/ week). The patient's pre treatment Neck Disability Index score was 60% suggesting moderate disabilty whereas post treatment disability score was reduced to 20% which showed slight disability. Further deep neck flexor endurance test time was increased from 14 seconds to 24 seconds following the treatment regimen. Pressure pain threshold for upper trapezius, sub occipital and levator scapulae muscles was 0.90, 1.10, 0.80 Kg/cm^2 respectively before starting the treatment whereas it was increased to 1.32, 1.24, 1.14 Kg/ cm^2 respectively after giving treatment. The patient also showed 20^0 increases in cervical lateral flexion, increased flexibility in upper trapezius and levator scapulae muscle. Improvement in joint play and posture was also evident.

DISCUSSION

This trial supported that the use of Cranio cervical Training Programme for patient with Myofascial Pain Syndrome has not only effectively improved deep cervical musclesen durance and pressure pain threshold but also reduced neck disability. This is attributed to the fact that while performing craniocervical exercise, mobilisation effect is produced at upper cervical spine which modulates the pain perception which further reduces pain. [27,28,29,30,31,32] Furthermore, specific craniocervical training program emphasized motor control rather, than muscle strength. [33] Reduced deep cervical flexor endurance results in increased fatigability of muscles, which in turn affects the concentration and the ability to work and its long term effects eventually leading to increased cervical lordosis or forward head posture. Thereby, neck endurance training not only reduces pain but also improves the patient's ability to perform personnel care, reading, driving, having sound sleep, engaging in recreational activities and improving faulty posture.

Thus short term results of cranio cervical training in this particular case was found to be favorable, although long term outcomes were not observed. Further research focusing on evaluation of long term outcomes of Cranio-cervical Training Program in patients with Myofascial Pain Syndrome should be executed. A Randomized Controlled Trial can also be conducted to generalize the effectiveness of this treatment.

CONCLUSION

The Craniocervical Training Program was simple and easy to understand and found to be effective in reducing symptoms associated with myofascial pain syndrome as well as improving deep cervical flexor muscle endurance.

Conflicts of interest: None

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How to cite this article: Jeyanthi. S, Narkeesh Arumugam. EFFECTIVENESS OF CRANIO-CERVICAL TRAINING OVER MYOFACIAL PAIN SYNDROME: A CASE STUDY. Int J Physiother Res 2015;3(3):1032-1036. **DOI:** 10.16965/ijpr.2015.129