Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 08, 2022

Original research article

Impact of hyoid bone mobilization and fascia relaxation on pain in cervicogenic headache patients

[1]Dr. Shilpi Kapoor, [2]Dr. Urvashi, [3]Dr. Vaibhav Choubey, [4]Dr. Ashish Mishra

[1,3,4]Research Scholar, Department of Physiotherapy, Malwanchal University, Indore, Madhya Pradesh, India

[2]Professor, Department of Physiotherapy, Malwanchal University, Indore, Madhya Pradesh, India

Corresponding Author:

Dr. Ashish Mishra

Abstract

Background: Any anatomical structure, including the Hyoid bone, can cause neck pain and cervicogenic headache. Hyoid bone plays an important role in neck posture and movement but there are limited studies on effect of hyoid bone mobilization in cervicogenic headache.

Objectives: This study aimed to investigate the effect of hyoid bone mobilization and fascia relaxation on pain in cervicogenic headache patients.

Methods: Fifty patients with cervicogenic headache were enrolled randomly for this prospective interventional study using lateral motion test. Five patients with intervertebral disease were excluded. Sociodemographic characteristics were recorded. A visual analogue scale (VAS) was used to measure the subjective pain. Then, patients were treated with hyoid bone mobilization and fascia relaxation, and all parameters were recorded after intervention. Results were compared using paired students't test.

Results: There was significant reduction in pain after performing hyoid bone mobilization and fascia relaxation (p<0.05).

Conclusions: Hyoid bone mobilization and fascia relaxation can effectively reduce pain in cervicogenic headache patients.

Keywords: Hyoid bone, headache, fascia relaxation, pain, cervicogenic

Introduction

Cervicogenic Headache (CGH) is one of the more common types of headache and may account for 0.4-15% of the headache population and up to 15-20% of all chronic and recurrent headaches [1]. Women have been reported to be affected four times more frequently than men, although some research about prevalence between the sexes is contradictory. The International Headache Society (IHS) issued its initial International Classification of Headache Disorders (ICHD) in 1988 [2] and published revised editions in 2004 and in 2013. The current ICHD III beta version classifies CGH as a secondary headache arising from musculoskeletal disorders in the cervical spine and is frequently accompanied by neck pain.

CGH occurs when pain is referred from a specific source in the neck up to the head. This pain is commonly a steady ache or dull feeling, but sometimes the pain intensity can worsen. People may confuse cervicogenic headaches with migraine and tension headaches, both of which can cause neck pain. Cervicogenic headaches are secondary headaches. Secondary headaches result from an underlying condition, such as neck injuries, infections, or severe high blood pressure. CGH symptoms are usually side-locked, which means they occur on one side of the neck, head and/or face. CGH usually starts as an intermittent pain and may progress to become a continuous pain [3, 4]. Among the various treatments available for such neck pain, manual therapy is perhaps the widely used one. Many studies have suggested that myofascial relaxation is a form of manual therapy that applies low- intensity, chronic stretching to the fascia, resulting in pain reduction [5, 6].

Any anatomical structure, including the Hyoid bone, can cause neck pain and cervicogenic headache. Hyoid bone plays an important role in neck posture and movement but there are limited studies on effect of hyoid bone mobilization on pain in cervicogenic headache.

Aims & Objectives: This purpose of this study was to investigate the effect of hyoid bone mobilization and fascia relaxation on pain in cervicogenic headache patients.

Material & Methods

We conducted a prospective interventional study in the department of Physiotherapy in Index Medical College Hospital, Indore. All the CGH patients who attended the outpatient department were the population of this study.

Fifty patients with CGH who were between 15 & 75 years of age, who had neck pain on rotation of the cervical spine and who had deviation in the lateral motion test were enrolled randomly for this

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 08, 2022

prospective interventional study. Subjects with severe medical conditions (e.g., cancer, rheumatoid arthritis, ankylosing spondylitis or other related autoimmune diseases), symptoms of cervical myelopathy (e.g., disagreement of hands, arms and legs, active gait disturbances), bladder incontinence (e.g., neuromuscular sensory changes, muscle weakness, or reflexes) history of pregnancy or postpartum, intervertebral disc-related diseases, neck pain from traumatic events or cervical spine surgery were excluded. Five such patients with intervertebral disease were excluded from the study.

Before the measurement, the subjects were accustomed to the process. A Visual Analog Scale was used to measure subjective pain in patients with cervical spine rotation. The left and right deviations of the hyoid bone were recorded by measuring the center point. After baseline measurements, the intervention i.e. hyoid bone mobilization and fascia relaxation was performed. Immediately after the intervention, same therapist measured VAS for pain during rotation of the cervical spine.

For Hyoid bone mobilization, the patient was laid in an anatomical position, while the therapist sat on the side and fixed the head with one hand. The therapist then palpated the thyroid scar with the other hand and palpated the hyoid bone, which is located 1 cm above. Now the therapist palpated the greater cornua on both sides of the hyoid bone with the thumb and index finger. When grabbing hyoid bone, care was taken not to disturb the breathing and compress the carotid arteries. Mobilize left and right at a speed that allows you to move from the left end to right end in one second, with a range and intensity of some resistance. This was repeated 4 times for 30 seconds to relax the muscles around the hyoid bone.

For myofascial relaxation, the patient was laid in an anatomical position, and therapist sat on the side and held the head in one hand. The therapist then palpated the thyroid cartilage notch with the other hand, and palpated the hyoid bone 1 cm above. The patient was moved outward along the hyoid body with his thumb and index finger to palpate the greater cornua on both sides of the hyoid bone. This was repeatedly gently for 30 seconds to two minutes to change the length of the fascia.

Statistical analysis: All dataanalyzed using SPSS version 22. Descriptive statistics were represented with percentages; Mean with SD. $P \leq 0.05$ was considered as statistically significant

Results

Table 1 describes the socio-demographic characteristics of study sample. Most of the patients (n=29, 58%) were females. The mean age of the sample was about 33 years. The mean height, weight and BMI were about 175 cm, 51 Kg and 17 Kg/m^2.

Table 1: Socio-Demographic Data Characteristics

Variable	N = 50
Gender	
Male, N (%)	21 (42)
Female, N (%)	29 (58)
Age in Years (Mean ± SD)	32.96 ± 11.4
Height in cm (Mean ± SD)	174.18 ± 3.21
Weight in Kg (Mean ± SD)	51.08 ±9.80
BMI in Kg/m^2(Mean ± SD)	17.18 ± 6.21

Table 2 describes subjective pain by VAS before and after hyoid bone mobilization and fascia relaxation intervention. After the intervention, the VAS score significantly decreased (p<0.05) from a mean of 8.5 to 3.4.

Table 2: Pain by VAS before and after intervention

Variable	Pre treatment (Mean ± SD)	Post treatment (Mean ± SD)	P value
Pain by VAS	8.48 ± 1.11	3.4 ± 1.19	p<0.05

Discussion

Hyoid bone plays an important role in neck posture and movement [7, 8]. As there are limited number of studies on effect of hyoid bone mobilization on pain in CGH patients, this study was planned to study the effect of hyoid bone mobilization and fascia relaxation on subjective feeling of pain in CGH patients.

We found that there was significant reduction in pain measured by VAS after performing hyoid bone mobilization and fascia relaxation in CGH patients (p<0.05).

Some previous studies have suggested that Hyoid mobilization has an effect on pain relief. In previous studies, pain severity was reduced after hyoid mobilization [9]. In a study on patients with acute neck pain, both the average pain value and most severe pain value were decreased after Hyoid mobilization [10]. Also, there was a significant change in pain and movement disorders when myofascial relaxation was applied to patients with chronic lumbar disc herniation. However, this was different from the present study [11].

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 08, 2022

The myofascial relaxation (MFR) technique is an effective passive therapy that releases the damaged areas in sliding fascial mobility and reduces pain in patients with nonspecific neck or low back pain [12]. MFR applied to the neck and upper limbs was found to be effective in reducing the pain intensity [2]. Also, in a systematic review and meta-analysis, MFR decreased pain levels and improved joint motion range [13]. Therefore, hyoid bone mobilization and fascia relaxation can be a useful tool in reducing pain and improving movement disorders in CGH patients.

Although neck movement and the role of the hyoid bone and muscles are interrelated, there has been limited number of studies on hyoid lateral deviations after hyoid bone fascia mobilization and fascia relaxation intervention. A previous study reported that physiotherapy techniques can change the anatomical relationship in the head and neck [14]. Although, a previous study on young adults showed no effect on the relationship between head posture and various hyoid bone positions; in a recent study, suggested that the hyoid bone position changed significantly after treatment for myofascial pain [15]. Further studies are needed to determine the effect of hyoid fascia relaxation and mobilization on the hyoid bone deviation.

Limitations of study: Our study assessed the effect of Hyoid bone mobilization and fascia relaxation on subjective feeling of pain in CGH patients. The small sample size derived from one department may not lead to dependable results and conclusions. Most similar studies were done on patients with neck pain, but our study population specifically included CGH patients. This difference may affect the findings. Another limitation was the absence of a comparison group. Such a group if studied could lead to different results and interpretations.

Conclusion

Hyoid bone mobilization and fascia relaxation can effectively reduce pain in cervicogenic headache patients.

Conflicts of interest: None.

Source of funding: None.

References

1. Cervicogenic headaches: An evidence-led approach to clinical management, The International Journal of Sports Physical Therapy, 2011 Sep, 6(3).
2. Park KN, Ha SM, Kim SH, Kwon OY. Immediate effects of upper trapezius stretching in more and less tensed positions on the range of neck rotation in patients with unilateral neck pain. Phys. Ther. Korea; c2013.
3. Al Khalili Y, Ly N, Murphy PB. Cervicogenic Headache. [Updated 2022 Oct 3]. In: Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; c2023 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507862/
4. Sjaastad O, Saunte C, Hovdahl H, Breivik H, Gronbaek E. "Cervicogenic" headache. An hypothesis. Cephalalgia. 1983 Dec;3(4):249-56.
5. Ajimsha MS, Al-Mudahka NR, Al-Madzhar JA. Effectiveness of myofascial release: systematic review of randomized controlled trials. J Bodyw Mov Ther. 2015;19(1):102-12.
6. Sambyal R, Moitra M, Samuel AJ, Kumar SP. Does myofascial release technique contribute to cervical radiculopathy treatment? Cues from a no controlled experimental design study. Revista Pesquisa em Fisioterapia. 2016;6(2):148-57.
7. Sathyapriya B. A Review on Clinical Significance of Hyoid Bone. European Journal of Molecular & Clinical Medicine. 2020;07(5):1293-1297.
8. Auvenshine RC DDS, PhD, Pettit NJ DMD, MSD. The hyoid bone: an overview. Cranio. 2020;38(1):6-14. PMID: 30286692.
9. Lee NY, Kim SY. Comparison of immediate effects of pain, range of motion and treatment satisfaction on difference of applying joint mobilization levels in patients with acute mechanical neck pain. Phys Ther Korea. 2015;22(3):50-60.
10. McNair PJ, Portero P, Chiquet C, Mawston G, Lavaste F. Acute neck pain: cervical spine range of motion and position sense prior to and after joint mobilization. Man Ther. 2007;12(4):390-4.
11. Mahbobeh S, Alireza M, Soheila Y, Leila A. Effects of myofascial release technique on pain and disability in patients with chronic lumbar disc herniation: a randomized trial. Phys Med Rehab Kuror. 2017; 27(4):218-25.
12. Tozzi P, Bongiorno D, Vitturini C. Fascial release effects on patients with non-specific cervical or lumbar pain. J Bodyw Mov Ther. 2011;15(4):405-16.
13. Webb TR, Rajendran D. Myofascial techniques: what are their effects on joint range of motion and pain?-a systematic review and meta-analysis of randomized controlled trials. J Bodyw Mov Ther. 2016;20(3):682-99.

ISSN:0975 -3583,0976-2833 VOL13, ISSUE 08, 2022

14. Rocabado M. Biomechanical relationship of the cranial, cervical, and hyoid regions-a discussion. J Craniomandib Pract. 1983;1(3):61-6.
15. Pettit NJ, Auvenshine RC. Change of hyoid bone position in patients treated for and resolved of myofascial pain. Cranio; c2018. [E pub]. Doi: 10.1080/08869634.2018.1493178.