

Comparison of Sub-Occipital Myofascial Release and Cervical Mobilization in managing Cervicogenic Headache

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ABSTRACT

Objective: To determine the effects of sub-occipital myofascial release in patients with cervicogenic headache.

Study Design: Randomized Clinical Trial study

Place and Duration of Study: This study was conducted at the conducted at Lateef Clinic Nespack society and Al-Kareem Aman Health Care Center, Lahore from July 2020 to February 2021.

Materials and Methods: Non-probability convenient sampling technique was used, 22 patients were included and were randomized through sealed envelope method in two groups. Group A was given sub-occipital myofascial release along with conventional therapy while group B was given cervical mobilization and conventional therapy. Participants of both gender with age range 20 to 50 years with Neck pain referring the unilateral pain to the sub-occipital region and head were included in the study. Patient who do not tolerate the cranio-cervical Flexion rotation test were excluded from the study. Neck Disability Index, Pain Numerical Rating Scale, and goniometer were outcome measuring tools. The data was analyzed using SPSS 21.

Results: The descriptive statistics regarding age in myofascial release showed that mean and standard deviation found to be 30.63 ± 4.90 while age in control group found to be that of 33.18 ± 3.62 . NDI of Group A pre-treatment 21.72 ± 2.8 and post treatment 6.27 ± 1.8 . Group B 23.09 ± 4.4 and post treatment 11.00 ± 3.3 and P value was less than 0.05. PNRS showed same result with significant p-value. Cervical ranges were also improved more in Group A.

Conclusion: The study concluded that both Sub-occipital myofascial release and cervical mobilization were effective in reducing pain of cervicogenic headache. The results were statistically significant for both groups, though the sub-occipital myofascial release group found better than conservative group in terms of mentioned outcome measures on the basis of mean differences.

Key Words: Cervicogenic headache (CGH), Neck disability index (NDI), Pain Numerical Rating Scale (PNRS)

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INTRODUCTION

The secondary form of headache that arises from the upper cervical spine and atlanto-occipital joint is cervicogenic headache (CGH).^{1,2} This headache is a recurrent and sometimes misdiagnosed source of chronic headache³.

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The discomfort is generally unilateral most of the times and is certainly not just a neck pain rather it presents also with pain in temporal, frontal, ocular regions and sometimes face as well. The headache does not alter the sides, but often certain patients can sometimes feel it on the opposite side when serious⁴. Cervicogenic headache is unilateral headache. Some patients present with continuous basal headache. Its course is fluctuating and long term, with many remissions and exacerbations.⁵ Convergence of trigeminal nerve afferents with the afferents of the upper three cervical spinal nerves is the anatomical cause of cervicogenic headache⁶. Several studies indicate that the fusion of nerves that innervate the head with those that innervate the cervical spine is not only between trigeminal and cervical afferents, as other nerves such as the larger occipital nerve, the lower occipital nerve, and the larger auricular nerve innervate the head.⁶⁻⁸ The potential causes of cervicogenic headache lie in the area innervated by C1-C3 spinal nerves, upper cervical muscles, sub-occipital muscles, C2-C3 discs, upper cervical synovial joints,

vertebral and internal carotid arteries, upper cervical spine, posterior cranial fossa and Dura matter.¹ Diagnosis of cervicogenic headache depends on the detailed history, manual examination and assessment of nervous system. After the diagnostic block test disappearance of headache shows that the source of this pain is cervical spine.^{2,3} A lot of work has been done on cervicogenic headache but very few studies Support the effects of sub-occipital myofascial release technique combined with other Techniques but no study has shown evidence on this technique as a single and primary Intervention in patients with cervicogenic headache. An uncontrolled experimental study was conducted on 9 patients from different physiotherapy clinics. These patients were suffering from cervicogenic headache. They were treated with manual therapy and 10 physiotherapy interventions. Neck disability index and visual analogue scale was used as measurement tools for pain. The study found that this multimodal approach was quite helpful to reduce symptoms and cervical disability.³ Dr. L.Rameshor conducted a comparative study in 2014. He did comparison of the effectiveness of myofascial release with positional release therapy in patients with tension type headache. There were 28 subjects who fulfilled the criteria and participated in the study. Both the techniques proved to be effective in the study. The study found that the myofascial release technique is a good treatment choice to decrease pain as well as disability in patients having sub-occipital muscle trigger point in TTH.⁴ Park et al. in 2019 conducted a study. The aim of this study was to find out an effective technique of manual therapy for the patients that are suffering from cervicogenic headache. 30 subjects participated in the study. This study showed that neck stabilizing exercises were proved to be very effective in reducing the tone of cervical muscles and stiffness which will eventually improve posture.^{5,6} Mohammad Hosseinifar et al. conducted a randomized control study in 2017 to examine the effects of exercise therapy and neck myofascial release techniques on pain and disability in people suffering from chronic TTH. 30 female subjects have participated in the study who were having tension type headache. Subjects were randomly allocated in 2 groups. The results showed that myofascial release technique as well as exercise therapy has substantial effect on patients suffering from TTH.^{7,8}

MATERIALS AND METHODS

It was a Randomized Clinical Trial (NCT04816448). 22 Sample Size was recruited by Non-probability convenient sampling technique and randomization was done by Lottery method. Study was conducted at Lateef Clinic Nespac society and Al-Kareem Aman Health Care Center, Lahore. Participants of both Gender with Age between 20 to 50 Years presented with Neck pain

referring the unilateral pain to the sub-occipital region and Headache intensifying upon manual pressure to upper cervical joints and muscles were included in the study. Also patients with the cranio-cervical Flexion rotation exam, neck pain and ipsilateral headache and restriction of C1 and C2 rotation were also a part of study. Participants were excluded in case of Tension headache, if the patient not tolerate the cranio-cervical Flexion rotation test and those Patients who presented with autonomic symptoms like visual disturbance, vertigo, dizziness, Headache other than cervical origins and Clinically diagnosed as case of cervical radiculopathy or myelopathy.

Group A treated by Sub-occipital myofascial release with baseline treatment (Hot pack for 10 minutes, TENS for 10 minutes, Neck isometrics and stretching). For the application of the technique, the patient position is supine lying with the head fully supported on therapist's hands and therapist places 3 middle fingers just inferior to the nuchal line, lifts the fingers tips towards the ceiling while resting the head on the table and then therapist applied a gentle upward pull. This procedure done for 2 to 3 minutes and 5 to 7 repetitions, 3 sessions per week on alternate days were given for 6 weeks. **Group B** treated by cervical mobilization (SNAG technique) with baseline treatment. For cervical mobilization the patient's position was sitting on a chair in the erect posture. The therapist handled C2 spinous process with the middle phalanx of one hand. With the other hand, he performed ventral glide asked the patient to move neck in all directions (Flexion, Extension, Side bending and rotation) one by one and then slowly move the neck back to its starting position while the therapist maintained the ventral glide. NDI, PNRS and goniometer were outcome measuring tools. Pre-treatment and at 6th week post treatment readings were taken. Data was analyzed by using SPSS version 21.

RESULTS

Out of 22 participants 7 were males and 15 were females.

Table No.1: Gender detail with frequency and percentage

Group	Gender	Frequency	Percent
Group A	Male	3	27.3
	Female	8	72.7
	Total	11	100.0
Group B	Male	4	36.4
	Female	7	63.6
	Total	11	100.0

NDI shows -4.7 mean difference and P value was 0.01 while PNRS 0.001 p value at post-treatment reading. Cervical ranges including flexion, extension, side flexion (left & right) and cervical rotations shows significant p-value on independent-t test analysis.

Table No.2: Between Group Analysis

	Group	Mean	Std. Deviation	Mean Difference	P Value
Pre-Interventional Neck Disability Index	Group A	21.7273	2.86674	-1.36364	.400
	Group B	23.0909	4.41485		
Post-Interventional Neck Disability Index	Group A	6.2727	1.84883	-4.72727	.001
	Group B	11.0000	3.37639		
Pre-Interventional PNRS	Group A	6.9091	.83121	-.54545	.110
	Group B	7.4545	.68755		
Post-Interventional PNRS	Group A	.8182	.60302	-1.90909	.000
	Group B	2.7273	.90453		
Pre-Interventional Cervical Flexion	Group A	63.0909	2.11918	.81818	.445
	Group B	62.2727	2.76011		
Post-Interventional Cervical Flexion	Group A	84.4545	2.01810	5.09091	.000
	Group B	79.3636	3.32484		
Pre-Interventional Cervical Extension	Group A	50.1818	1.16775	-1.09091	.121
	Group B	51.2727	1.90215		
Post-Interventional Cervical Extension	Group A	70.9091	1.30035	2.54545	.011
	Group B	68.3636	2.69343		
Pre-Interventional Cervical Right Side Flexion	Group A	26.0000	1.54919	.81818	.255
	Group B	25.1818	1.72152		
Post-Interventional Cervical Right Side Flexion	Group A	39.2727	3.13340	3.90909	.003
	Group B	35.3636	2.20330		
Pre-Interventional Cervical Left Side Flexion	Group A	27.0000	2.00000	-.27273	.793
	Group B	27.2727	2.76011		
Post-Interventional Cervical Left Side Flexion	Group A	41.0000	2.52982	3.54545	.011
	Group B	37.4545	3.35749		
Pre-Interventional Right Cervical Rotation	Group A	59.2727	2.49363	1.81818	.083
	Group B	57.4545	2.16165		
Post-Interventional Right Cervical Rotation	Group A	80.7273	2.72363	6.18182	.000
	Group B	74.5455	2.42337		

Table No.3: With in Group Analysis

		Group A		Group B	
		Mean $\pm$	P-Value	Mean $\pm$	P-Value
Neck Disability Index	Pre-Treatment	21.7 $\pm$ 2.8	<0.001	23.1 $\pm$ 4.4	<0.001
	Post-Treatment	6.27 $\pm$ 1.8		11 $\pm$ 3.3	
PNRS	Pre-Treatment	6.9 $\pm$ 0.8	<0.001	7.4 $\pm$ 0.6	<0.001
	Post-Treatment	0.8 $\pm$ 0.6		2.7 $\pm$ 0.9	
Cervical Flexion	Pre-Treatment	63.0 $\pm$ 2.1	<0.001	62.2 $\pm$ 2.7	<0.001
	Post-Treatment	84.1 $\pm$ 2.0		79.3 $\pm$ 3.3	
Cervical Extension	Pre-Treatment	50.1 $\pm$ 1.6	<0.001	51.2 $\pm$ 1.9	<0.001
	Post-Treatment	70.9 $\pm$ 1.3		68.3 $\pm$ 2.6	
Cervical right side bending	Pre-Treatment	26 $\pm$ 1.5	<0.001	25.1 $\pm$ 1.7	<0.001
	Post-Treatment	39.2 $\pm$ 3.1		35.3 $\pm$ 2.2	
Cervical left side bending	Pre-Treatment	27 $\pm$ 2.0	<0.001	27.2 $\pm$ 2.7	<0.001
	Post-Treatment	41 $\pm$ 2.5		37.4 $\pm$ 3.3	
Cervical right rotation	Pre-Treatment	59.2 $\pm$ 2.4	<0.001	57.4 $\pm$ 2.1	<0.001
	Post-Treatment	80.7 $\pm$ 2.7		74.5 $\pm$ 2.4	
Cervical left rotation	Pre-Treatment	60.1 $\pm$ 2.8	<0.001	59.6 $\pm$ 2.4	<0.001
	Post-Treatment	82.1 $\pm$ 3.2		77.1 $\pm$ 2.6	

Comparison of PNRS mean scores Group A at Baseline, Post was found to be (6.9 ± 0.8), (0.8 ± 0.6) respectively having statistically significance (p-value < 0.001) within the Group B NDI value at baseline Post was found to be 23.1 ± 4.4 , 11 ± 3.3 respectively having statistically significance (p-value < 0.001).

DISCUSSION

The demographics were quite different from previously published studies in other parts of world where mostly have been reported almost equal distribution of cervicogenic headache in male and females. In current study, however, females were dominating in number over males. This is likely due to the cultural impact. Furthermore, the biological correlation is also very important where females are more likely to be affected by cervicogenic headache as compared to male. Nevertheless, statistics showed that current study had more female than male patients but almost with equal ratio in both groups.^{7,9} This improvement has been indicated by decrease in disability index score.

Myofascial release has also performed significantly better in terms of improvement in pain as compared to that of headaches snag. It has been noticed that myofascial release has consistently improved pain at post interventional assessment. Ranges have well responded to myofascial release technique and it was seen that all ranges such as cervical flexion and extension, left and right-side flexion, left and right rotation have improved in myofascial release technique group at post-operative assessments.^{10,11}

The physiological effects of myofascial release technique include reduction of pain sensitization and improved muscle performance by increasing flexibility underline musculature. In another past study conducted by Kvarstein G et in 2019, it was seen that these effects such as elongation of sarcomere and reduction of pain has been achieved by corticosteroids steroids injections and other such treatments.¹² In current studies myofascial release techniques have been used to address these impairments following cervicogenic headache and remarkable improvements were found in pain and cervical ranges. P value was less than 0.05 on NDI and PNRS.

Park SK conducted a study in 2017 and it was seen that by using stretching in comparison to massage and myofascial techniques the latter was two times more effective than traditional stretching techniques.¹³ These findings are directly related to the findings of current study where my facial release technique has been found significantly effective in improving range of motion in cervical region. Cervical flexion, extension, right & left side flexion and right & left side bending showed significant improvement in ranges in Myofascial release group.

In another study a 12-week program was given to patients with chronic neck pain including cervicogenic

headache. The main intervention in this study was therapeutic exercises in comparison to myofascial release techniques. Myofascial technique was also combined with trigger point therapy. It was seen that my facial technique was very effective in increasing motor performance by reduction of pain and sensitization of cervical structures, however therefore sound no apparent role of my facial technique in improving muscle fibres size and its strength as per shown by Olivier B in 2018.¹⁴ Current study showed same results, NDI score and NPRS score significantly reduced and cervical ranges were remarkably increased in myofascial release group. P-value was found less than 0.05

In a study, Barrows and Jessica found that cervical mobilization is more effective in pain alleviation and in improving motion range.¹⁵ In current study sub-occipital myofascial release showed significant results in improving cervicogenic headache.

In short myofascial techniques have been significantly effective in improving neck disability e generalized pain and cervical range of motion such as cervical flexion and extension cervical right and left side flexion and cervical right and left rotation. Further studies are warranted to investigate role of my facial techniques in improving for change in muscle fibers size and strength.

CONCLUSION

The findings concluded that sub-occipital myofascial release was significantly effective in improving neck disability, pain and ranges of cervical motion in patients with cervicogenic headache.

Author's Contribution:

Concept & Design of Study:	Maryam Shabbir
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Rodgers HB. APPROVAL SHEET: Florida Gulf Coast University; 2014.
2. Rubio-Ochoa J, Benítez-Martínez J, Lluch E, Santacruz-Zaragoza S, Gómez-Contreras P, Cook C. Physical examination tests for screening and diagnosis of cervicogenic headache: A systematic review. *Manual therapy* 2016;21:35-40.

3. Uthaikhup S, Barbero M, Falla D, Sremakaew M, Tanrprawate S, Nudsasarn A. Profiling the Extent and Location of Pain in Migraine and Cervicogenic Headache: A Cross-sectional Single-Site Observational Study. *Pain Medicine* 2020.
4. Singh LR, Chauhan V. Comparison of efficacy of myofascial release and positional release therapy in tension type headache. *JMSCR* 2014;2(9):2372-9.
5. Sedighi A, Ansari NN, Naghdi S. Comparison of acute effects of superficial and deep dry needling into trigger points of suboccipital and upper trapezius muscles in patients with cervicogenic headache. *J bodywork and movement therapies* 2017;21(4):810-4.
6. Park S, Yoon J. Effects of Neck Stabilizing Exercise on Muscle Characteristics, Muscle Activity and Posture in Patients with Cervicogenic Headache. *J Korean Society of Integrative Med* 2019;7(4):301-9.
7. Ramezani E, Arab AM. The effect of suboccipital myofascial release technique on cervical muscle strength of patients with cervicogenic headache. *Physical Treatments-Specific Physical Therapy J* 2017;7(1):19-28.
8. Hosseinifar M, Bazghandi R, Azimi Z, Bohlouli BK. Effectiveness of Neck Myofascial Release Techniques and Exercise Therapy on Pain Intensity and Disability in Patients with Chronic Tension-Type Headache. *Global J Health Sci* 2017;9(6).
9. Arab AM, Ramezani E. Sub occipital myofascial release technique for the treatment of cervicogenic headache. *J Bodywork and Movement Therapies* 2018;22(4):859.
10. Jafari M, Bahrpeyma F, Togha M. Effect of ischemic compression for cervicogenic headache and elastic behavior of active trigger point in the sternocleidomastoid muscle using ultrasound imaging. *J bodywork and movement therapies* 2017;21(4):933-9.
11. Yallappa M. A comparative study on effect of iliotibial band myofascial release on functional disability in patients with knee osteoarthritis. 2020.
12. Kvarstein G, Höglström H, Allen SM, Rosland JH. Cryoneurolysis for cervicogenic headache—a double blinded randomized controlled study. *Scandinavian J Pain* 2019;20(1):39-50.
13. Park SK, Yang DJ, Kim JH, Kang DH, Park SH, Yoon JH. Effects of cervical stretching and cranio-cervical flexion exercises on cervical muscle characteristics and posture of patients with cervicogenic headache. *J Physical Therapy Sci* 2017;29(10):1836-40.
14. Olivier B, Pramod A, Maleka D. Trigger Point Sensitivity is a Differentiating Factor between Cervicogenic and Non-Cervicogenic Headaches: A Cross-Sectional, Descriptive Study. *Physiotherapy Canada* 2018;70(4):323-9.
15. Kharwandikar P, Shende M. Effectiveness of sub-occipital myofascial release and cervical manipulation in patients with cervicogenic headache. *Int J Healthcare and Biomedical Research* 2019;7(04):25-32.