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Original Article

Effectiveness of Soft Tissue Release of Paracervical Muscles on the Cantho-Limbal Distance Among Young Adults

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ABSTRACT

Soft tissue release (STR) is a technique that is used to relax the tightened and tense muscles, fascia, and other connective tissue. **Objective:** To find out the effectiveness of soft tissue release of paracervical muscles on the cantho-limbal distance among young adults. **Methods:** A quasi-experimental study was carried out at Shalamar School of allied health sciences. A sample of 32 of reduced lateral cantho-limbal distance and neck pain was taken. A purposive sampling technique was used. Pre-test Cantho-limbal distance was measured by ABN tape in mm then technique of ischemic compression followed by stretching was applied and post-test Cantho-limbal distance was a measure. **Results:** Results show that the cantho-limbal distance before treatment was 7.38±0.98mm and after treatment, it increases to 10.06±0.88mm. The difference between the effect of pre-and post-treatment on Cantho-limbal distance was statistically significant (p-value <0.001). **Conclusion:** This study concluded that paracervical muscles and muscles of eyes have some neuronal and myofascial attachment so that soft tissue release of paracervical muscles has a significant and beneficial effect on reduced lateral cantholimbal distance.

INTRODUCTION

Soft tissue release (STR) is a technique that is used to relax the tightened and tense muscles, fascia, and other connective tissue. Various methods can be used for soft tissue release i.e. massage, stretching, ischemic compression, etc. Ischemic compression is the method in which sustained digital pressure over a specific point is applied for a specific time duration to reduce muscle tension [1]. The ischemic compression technique is beneficial for musculoskeletal problems such as neck pain and low back pain (LBP) [2]. Stretching increases the flexibility of the muscles and connective tissue by altering the viscoelastic properties of the muscle tendon unit [3,4]. Cantho-limbal distance is the distance from the lateral cantus to the lateral corneal limbus. The normal average value of this distance lies in the range of 10 to 11 in mm [5].

Non-specific neck pain (NSNP) is a very common musculoskeletal disorder and the leading cause of disability worldwide. Office workers in schools, hospitals and, students have been observed to have a high incidence of neck pain and neck muscle tightness. It is due to prolonged sitting and poor posture i.e. excessive cervical flexion and rotation, kyphotic posture and, some work environmental demands[6,7] Young adults of age18 to 29 years old are in a transitional stage between adulthood and adolescence during which various changes takes place in biological parameters such as muscles strength, body height, weight, and socioeconomic status also emerge in this phase of life so inequality in these factors leads to MSK problems[8]. The shoulder, scapula, and upper trapezius muscle are most commonly affected. The inflammation is

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caused by tight muscles, leading to impairment in surrounding soft tissue and fascia and these changes further transfer to other soft tissue through myofascial chains. Ischemic compression causes stimulation of mechanoreceptors and leads to a rapid inflow of oxygenated blood on that area to release tension and pressure and improve cervical range of motion (ROM) [9]. Neck pain and muscle tightness have a prevalence between 16%to75% also it is the fourth greatest reason for disability, affecting young adults in the range of 40% to 50% [10,11]. Researchers reported that depending on the degree of functional coupling of the eye and neck muscle the proprioceptive messages arise from the neck muscle and take into account and processed with the retinal and proprioceptive extra ocular information [12]. The stimulation of cervical muscle causes activation of the reflexes known as spinoocular reflexes, cervicoocular reflexes, and neck reflexes [13]. The increasing demand of eye load as a result of workload on computers, during studies and poor posture leads to eyes symptoms with various scapular or neck area problems [14]. Researchers study the relationship between trapezius muscles activation and force of contraction of ciliary muscles and found a strong correlation between them especially in people of age 19 to 28 years old. They explain the direct relationship between trapezius muscle activation and the force of contraction of ciliary muscles [15,16]. According to the literature, the previous studies only describe the correlation between neck, scapular, and shoulder muscles with eyes but there was no study conducted to check out the effectiveness of soft tissue release of paracervical muscle on cantholimbal distance.

METHODS

Subjects were recruited based on inclusion and exclusion criteria by purposive sampling technique. The written consent and the study protocol were provided after the recruitment. After signing the consent, the basic demographics, neck pain disability index (Venon-Mior) questionnaire for the level of disability was documented. The subject was then be requested to be positioned in a sitting [17].Firstly, measure the cervical spine ROM with a goniometer to assess the flexibility of neck muscles and note down the readings in degrees [18] then instruction was given to the subject to see at a fixed point in neutral position of the head to measure the pre-test cantho-limbal distance with ABN tape from lateral canthus of eye to the lateral limbus (reading in mm) and readings were noted down on performa (pre-test reading). Secondly, intervention (ischemic compression followed by trapezius muscle stretching) was applied on subjects to the involved side (reduced cantho-limbal) and asked to report immediately (if they feel any pain then stop the procedure). After that instruction, the subject to see at a fixed point in neutral position of the head to measure the post-test cantholimbal distance with ABN tape from lateral canthus of eye to the lateral limbus (reading in mm), and readings were noted on performa (post-test reading). After that, the difference between the measurements of both pre-test and post-test was checked. The study was no follow-up. The whole procedure was only 10 minutes.

RESULTS

A total of 32 participants (24 females and 8 males) were recruited for this study from age 18 to 25 shown in table -1. Among 32 participants 18 participants (2 males and 16 females) had pain and muscle stiffness on the right side of the neck and 14 participants (6 male and 8 female) had pain and neck stiffness on the left side neck shown in table -2. The results of NDI showed that 23 participants (8 males and 15 females) had a mild disability and 9 participants (9 females) had moderate disability shown in table-3.To check the pre and post-test effectiveness of soft tissue release of paracervical muscle on the cantholimbal distance we use paired sample t-test that shows that the cantho-limbal distance before treatment was 7.38±0.98mm and after treatment, it increases to 10.06±0.88mm as shown in table -3. The difference between the effect of pre- and post-treatment on cantholimbal distance was statistically significant (p-value <0.001).

Gen	Freq	Perc
Mal	8	25.0
Fem	24	75.0
Tot	32	100

Table 1: Frequencies distribution according to gender

		Area		
Gender		Right si	Left si	Total
Male	Count	2	6	8
	% within Ge	25.0%	75.0%	100.0
Fema	Count	16	8	24
	% within Ge	66.7%	33.3%	100.0
Total	Count	18	14	32
	% within Ger	56.3%	43.8%	100.0

Table 2: Frequency distribution according to the area of neck pain involvement

			Mild disabilit	Moderate disability	
Gender	Male	Count	8	0	8
		% within Gende	100.0%	0.0%	100.0%
	Female	Count	15	9	24
		% within Gende	62.5%	37.5%	100.0%
Total		Count	23	9	32
		% within Gender	71.9%	28.1%	100.0%

Table 3: Frequency distribution according to the level of disability (NDI)

	Pre	post	p-valu
Cantho Limbal distanc	7.38±0.9	10.06±0.	<0.00

Table 4: Paired sample test statistics of pre and post-test

DISCUSSION

This study shows that there is a significant relation

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between cervical muscles and cantholimbal distance as the tightness of the neck muscle muscles leads to a reduction in lateral cantholimbal distance due to some myofascial chains and neuronal connections. There are limited reported studies that observe the relationship between cervical muscles and the eye[16-19]. There was no study conducted to check the effectiveness of soft tissue release on paracervical muscle on the eye in this study the soft tissue release techniques (Ischemic compression followed by stretching) is applied to paracervical muscles to check out that either release of the soft tissue of cervical region had some effect on the eye and the result was statistically significant. In this study, it is found that females are more prone to neck pain Chiu observes that there is a significant association between pain and gender distribution. Females are more prone to neck pain due to psychological reasons and hormonal changes [20]. In this study, it is found that neck pain and cervical muscles tightness are commonly found among medical students and medical care workers observe that due to studies stress, tough clinical routine, regular use of mobile phones and poor posture during studying become a leading factor of the non-specific neck pain [21]. In this study, it is found that the factors such as hand dominance and the arm they use to perform their task also have an impact on neck muscles tightness. The right-hand dominant people usually involve right-sided neck pain. This study shows that participants of having mild nonspecific neck pain and muscle tightness have reduced lateral cantholimbal distance but less than those who have moderate neck pain. According to this study results, soft t tissue release of paracervical muscles has a significant effect on lateral cantholimbal distance.

CONCLUSION

This study concluded that paracervical muscles and muscles of eyes have some neuronal and myofascial attachment so that STR of paracervical muscles has a significant and beneficial effect on reduced lateral cantholimbal distance.

REFERENCES

[1] Shah N, Shah R et al.Comparison of two treatment techniques: Muscle energy technique and Ischemic compression on upper trapezius trigger point in subjects with non-specific neck pain.2015, 4: 260. doi.org/10.5455/ijtrr.000000100

[2] Da Silva AC, De Noronha M, Liberatori-Junior RM et al. The effectiveness of ischemic compression technique on pain and function in individuals with shoulder pain: a systematic review. Journal of Manupulative and Physiological Therapeutics, 2020. doi.org/10.1016/j.jmpt.2019.10.013

[3] Gasibat Q, Simbak NB, Aziz A et al,. Stretching exercises to prevent work-related musculoskeletal disorders: A review article. American Journal of Sports Science and Medicine, 2017,5: 27-37.doi.org/10.12691/ajssm-5-2-3

[4] Choi SD, Woletz TJJ. Do stretching programs prevent work-related musculoskeletal disorders.2010, 6, 1-19.

[5] Ahn J, Kim SH. Relationship between cantho-limbal distance and degree of head turn in a Korean population. Can J Ophthalmol. 2016, 51(1):30-3. doi: 10.1016/j.jcjo.2015.09.007.

[6] Ye S, Jing Q, Wei C. Risk factors of non-specific neck pain and low back pain in computer-using office workers in China: a cross-sectional study. 2017,7: e014914. doi.org/10.1136/bmjopen-2016-014914

[7] Heintz MM & Hedeus EJ. Multimodal Management of Mechanical Neck Pain Using a Treatment Based Classification System. Journal of Manual & Manipulative Therapy,2008, 16: 217-224. doi.org/10.1179/106698108790818260

[8] Ahre H, Grotle M, Smedbråten K, Dunn KM, Øiestad BE. Risk factors for non-specific neck pain in young adults. A systematic review. BMC Musculoskelet Disord. 2020 Jun 9;21(1):366. doi: 10.1186/s12891-020-03379-y.

[9] Kisilewicz A, Janusiak M, Szafraniec R, Smoter M, Ciszek B, Madeleine P, Fernández-de-Las-Peñas C, Kawczyński A. Changes in Muscle Stiffness of the Trapezius Muscle After Application of Ischemic Compression into Myofascial Trigger Points in Professional Basketball Players. J Hum Kinet. 2018 Oct 15;64:35-45. doi: 10.2478/hukin-2018-0043. PMID: 30429897; PMCID: PMC6231330.

[10] Bailey E, Heneghan NR, Cassidy NJ, Falla D, Rushton AB. Clinical effectiveness of manipulation and mobilisation interventions for the treatment of non-specific neck pain: protocol for a systematic review and meta-analysis. BMJ Open. 2020 Oct 10;10(10):e037783. doi: 10.1136/bmjopen-2020-037783.

[11] Cohen SP. Epidemiology, diagnosis, and treatment of neck pain. Mayo Clin Proc. 2015 Feb;90(2):284-99. doi: 10.1016/j.mayocp.2014.09.008.

[12] Fuller JH. The dynamic neck-eye reflex in mammals. Exp Brain Res. 1980;41(1):29-35. doi: 10.1007/BF00236676.

[13] Roll R, Velay JL, Roll JP. Eye and neck proprioceptive messages contribute to the spatial coding of retinal input in visually oriented activities. Exp Brain Res. 1991;85(2):423-31. doi: 10.1007/BF00229419.

[14] Richter H & Forsman MJN et al.

DOI: https://doi.org/10.54393/pbmj.v5i2.249

Accommodation/vergence eye movements and neck/scapular muscular activation: gaze control with relevance for work-related musculoskeletal disorders.2011, 5: 99-112.

[15] Domkin D, Forsman M, Richter HO. Ciliary muscle contraction force and trapezius muscle activity during manual tracking of a moving visual target. J Electromyogr Kinesiol. 2016 Jun;28:193-8. doi: 10.1016/j.jelekin.2015.11.008.

[16] Domkin D, Forsman M, Richter HO. Effect of ciliary-muscle contraction force on trapezius muscle activity during computer mouse work. Eur J Appl Physiol. 2019 Feb;119(2):389-397. doi: 10.1007/s00421-018-4031-8.

[17] Vernon H, Mior S. The Neck Disability Index: a study of reliability and validity. J Manipulative Physiol Ther. 1991 Sep;14(7):409-15. Erratum in: J Manipulative Physiol Ther 1992 Jan;15(1):followi.

[18] Gajdosik RL, Bohannon RW. Clinical measurement of range of motion. Review of goniometry emphasizing reliability and validity. Phys Ther. 1987 Dec;67(12):1867-72. doi: 10.1093/ptj/67.12.1867.

[19] Richter HO, Andersson J, Schneider H, Långström B. Neuroanatomical correlates of voluntary inhibition of accommodation/vergence under monocular open-loop viewing conditions. Eur J Neurosci. 2005 Jun;21(11):3077-88. doi: 10.1111/j.1460-9568.2005.04140.x. Erratum in: Eur J Neurosci. 2005 Jul;22(2):539.

[20] Chiu TT, Ku WY, Lee MH, Sum WK, Wan MP, Wong CY, Yuen CK. A study on the prevalence of and risk factors for neck pain among university academic staff in Hong Kong. J Occup Rehabil. 2002 Jun;12(2):77-91. doi: 10.1023/a:1015008513575.

[21] Behera P, Majumdar A, Revadi G, Santoshi JA, Nagar V, Mishra N. Neck pain among undergraduate medical students in a premier institute of central India: A cross-sectional study of prevalence and associated factors. J Family Med Prim Care. 2020 Jul 30;9(7):3574-3581. doi: 10.4103/jfmpc.jfmpc_206_20.