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Original Article

Effectiveness of Manual Compression and Stretching for The Myofascial Trigger Points in Upper Trapezius and Levator Scapulae in Office Workers

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ABSTRACT

Background: Chronic cervical pain is a prevalent global health concern, frequently associated with myofascial trigger points in the levator scapulae and upper trapezius muscles. Comparing the efficacy of manual compression and stretching as treatments for these trigger points is essential for optimizing pain management strategies.

Objective: The objective of this study was to evaluate the comparative effectiveness of manual compression versus manual stretching on myofascial trigger points in the levator scapulae and upper trapezius among office workers suffering from cervical pain.

Methods: This randomized controlled trial included 100 patients with cervical pain, divided into two groups: Group A (n=50) received manual compression, and Group B (n=50) underwent manual stretching on myofascial trigger points in the levator scapulae and upper trapezius. Outcomes assessed were pain levels, range of motion (ROM), and quality of life, measured before and after the interventions. Statistical analysis was conducted using the Chi-square test for between-group comparisons.

Results: Post-intervention, both groups showed significant improvements in pain levels, ROM, and occupational functionality. Group A exhibited superior results with significant enhancements in cervical and shoulder ROM ($p < .0001$), compared to Group B. No significant differences were observed between the groups in terms of shortness of breath ($p = .628$).

Conclusion: Manual compression proved more effective than manual stretching in improving ROM and reducing pain among patients with cervical myofascial trigger points. Further studies with larger cohorts and longer follow-up are necessary to corroborate these findings.

Keywords: Cervical Pain, Comparative Study, Levator Scapulae, Manual Compression.

INTRODUCTION

Myofascial trigger points (MTrPs) are palpable, discontinuous nodules found within the taut bands of skeletal muscles, commonly caused by muscles being overextended, shortened, or overloaded. These trigger points can be classified as either active, causing spontaneous pain, or latent, eliciting discomfort only upon compression. A substantial body of research, including a recent study analyzing 258 samples, found that a significant 70.5% of participants exhibited myofascial trigger points in the upper trapezius muscle, with latent MTrPs being more prevalent (71.4%) than their active counterparts (1, 2). These points are particularly inclined to develop in the upper trapezius and levator scapulae muscles, often resulting in referred pain that can affect the neck, shoulder, and scapular areas.

The development of myofascial trigger points is frequently linked to poor posture and non-compliance with ergonomic guidelines, which not only contribute to neck discomfort but may also impact respiratory functions. Studies have shown that approximately 49% of office workers experience acute neck pain, while chronic neck pain is reported by 64% (3). Furthermore, MTrPs are associated with conditions affecting the neck and shoulder, severely impairing individuals' work performance and daily activities. In fact, latent

Journal of Health and Rehabilitation Research 2791-156X JHRR

MTrPs in the levator scapulae have been implicated in various neck and shoulder disorders, highlighting the need for effective management strategies (4, 5).

The prevalent etiology of MTrPs involves repetitive tasks or sustained postures, with a noted correlation between the presence of these trigger points and neck discomfort. Among the affected muscles, the trapezius, levator scapulae, and suboccipital muscles exhibit the highest frequency of active MTrPs (6). Commonly, the treatment modalities for myofascial trigger points include manual therapies such as myofascial release, trigger point therapy, and dry needling. Notably, dry needling has been shown to significantly increase range of motion and decrease pain, whereas manual pressure release effectively alleviates discomfort in the trapezius muscle (7, 8). Complementary to these are therapeutic exercises—stretching, strengthening, and posture correction—which have been validated in randomized controlled trials for their efficacy in reducing pain and improving muscular function (9-11).

In this context, manual compression, also known as ischemic compression, emerges as a potent therapy for MTrPs. This technique involves the application of sustained pressure to the trigger point, resulting in restricted blood flow followed by hyperemia upon release, thus facilitating healing. Research by Hains, Descarreaux, and Lamy (2010) confirmed the efficacy of this approach in significantly reducing pain and enhancing active range of motion in patients suffering from neck pain attributed to MTrPs (12). Similarly, stretching exercises, particularly when implemented along with other therapeutic interventions, play a crucial role in managing MTrPs by increasing flexibility, reducing muscle tension, and promoting muscle health.

Considering the prevalence and impact of MTraps in the workforce, this study aimed to determine a more effective treatment protocol between manual compression and stretching for alleviating myofascial trigger points in the upper trapezius and levator scapulae among office workers. The objective was to ascertain which of these interventions proves more reliable and beneficial in improving the conditions of patients afflicted with MTrPs, thus enhancing their ability to engage in professional and daily activities.

METHODS

In this randomized controlled trial, office workers at the Arbisoft software house on Canal Road near Thokar Niaz Baig, Lahore, were recruited to assess the effectiveness of manual compression versus stretching for treating myofascial trigger points in the upper trapezius and levator scapulae. The study population consisted of male office workers aged 25-45, working 6-8 hours per day from Monday to Friday. Initially, 75 individuals were assessed for eligibility based on the inclusion criteria of having at least one year of experience in their current role, being within the specified age range, and not having any past trauma, chronic illnesses, recent surgeries, or systemic diseases (39).

The sample size, calculated using the Open Epi tool, required 34 participants per group to achieve a power of 80% with a 95% confidence interval, assuming mean standard deviations of 17.2 and 19.5 for Group 1, and 31 and 21 for Group 2, with variances of 380.25 and 441, respectively, and a mean difference of-13.8. To accommodate a potential dropout rate of 10%, 75 participants were initially recruited. Following the dropout of five individuals for personal reasons, 70 participants were randomized into two groups of 35 each, using a lottery method. The study was conducted over a six-month period, and randomization was single-blinded to reduce bias.

Each group underwent eight sessions of their assigned intervention. Group A received manual compression therapy, and Group B underwent manual stretching exercises. Both interventions were performed twice a week for four weeks, with each session lasting between 30 and 90 seconds, followed by the application of cold packs for 15 to 20 minutes to minimize inflammation and discomfort. At the end of the follow-up period, each group reported one additional dropout, leaving 34 participants per group for final analysis. This rigorous methodology ensured a standardized approach to comparing the effectiveness of manual compression versus stretching in a well-defined sample of office workers, providing reliable data on the therapeutic outcomes for myofascial trigger points in the targeted muscles.

RESULTS

In the conducted study, the analysis of pain levels and physical limitations among office workers subjected to different treatment modalities revealed distinct outcomes. Group A, which received manual compression therapy, exhibited consistently lower average pain levels across various conditions—during rest, activity, and both current and worst pain scenarios—compared to Group B, which underwent stretching exercises. The statistical analysis indicated significant differences with p-values of .000 for all pain measures, suggesting that manual compression might be a more effective intervention for managing cervical pain.

Further assessment of the frequency of pain experienced by the participants in both groups revealed that individuals in Group A reported a markedly lower incidence of pain. Whether at rest or during physical activities, participants in this group were more likely to categorize their pain frequency from "Never" to "Almost constantly" at significantly lower rates compared to their counterparts

in Group B. Notably, the effect of the intervention was more pronounced at rest, as evidenced by the lower p-values for this condition.

Regarding the impact of pain on occupational activities, participants in Group A reported significantly less disruption to their work-related tasks. A greater number of individuals in this group indicated that pain did not affect their occupational activities "Not at all," while participants in Group B were more likely to report moderate to severe interference with their work due to pain. This finding underscores the potential of manual compression therapy to maintain occupational functionality among office workers suffering from myofascial trigger points.

In terms of additional physical limitations and symptoms, the study observed that participants in Group A demonstrated significantly fewer limitations in cervical and shoulder range of motion compared to those in Group B, as supported by a p-value of .000. However, the interventions appeared to have limited impact on compensatory posture behaviors and respiratory symptoms, with no significant differences noted in these areas between the two groups; p-values were .100 and .628 respectively. This suggests that while manual compression effectively reduced physical limitations associated with cervical and shoulder conditions, its influence on compensatory behaviors and respiratory symptoms was less significant.

Overall, the results indicate that manual compression therapy provides substantial benefits in reducing pain and enhancing functional abilities in office workers with myofascial trigger points, though its effects on compensatory postural adjustments and respiratory functions remain inconclusive.

Table 1: Pain Level Comparisons Between Group A and Group B

	Group A (n=34)	Group B (n=34)	P value
Cervical Pain During Rest	1.29±.871	2.12±.769	.000
Cervical Pain During Activity	3.06±.776	4±.739	.000
Pain Level Right Now	2.06±.776	3±.739	.000
Pain Level At Its Worst	3.12±.844	5±.739	.000

Table 2: Frequency of Pain During Rest and Physical Activity

	How often do you have pain			How often do you have pain during physical activity		
	Group A	Group B	P value	Group A	Group B	P value
Never	7	1	.019	6	1	.059
Rarely	15	10	.019	15	9	.059
Occasionally	11	15	.019	10	15	.059
Frequently	1	5	.019	2	6	.059
Almost constantly	0	3	.019	1	3	.059

Table 3: Impact of Pain on Occupation

	How much the pain affects your occupation		
	Group A	Group B	P value
Not at all	22	10	.020
Slightly	8	11	.020
Moderately	3	11	.020
Very much	1	2	.020
Extremely	0	0	.020

Journal of Health and Rehabilitation Research 2791-156X JHRR

Table 4: Physical Limitations and Symptoms

	Limitations of cervical & shoulder ROM			Trouble finding compensatory posture			Experience shortness of breath		
	Group A	Group B	P value	Group A	Group B	P value	Group A	Group B	P value
Yes	3	19	.000	3	8	.100	3	4	.628
No	31	15	.000	31	26	.100	31	28	.628

DISCUSSION

The current study compared the therapeutic effects of manual compression versus manual stretching on myofascial trigger points in the levator scapulae and upper trapezius muscles of office workers suffering from cervical pain. While both interventions successfully alleviated pain and improved range of motion and occupational functionality, the findings clearly indicated that manual compression delivered superior outcomes in reducing pain levels, frequency, and impact on occupational activities. Notably, no significant differences were observed in the experiences of shortness of breath between the groups.

In line with prior research by Pecos-Martin et al. (2019), which examined the immediate impacts of pressure release techniques on the levator scapulae, our study supports the efficacy of targeted interventions on myofascial trigger points. Both studies underscore the potential benefits of manual therapies in managing musculoskeletal discomfort, although our results suggest that manual compression might offer greater relief from myofascial pain compared to stretching alone (20). Furthermore, the findings from Otadi et al. (2020) and Tabatabaiee et al. (2019) corroborate the effectiveness of various myofascial interventions, including ischemic compression and dry needling, which were not included in our protocol (39, 14).

A comparative perspective is provided by Jaeger and Reeves (1986), who documented improvements in myofascial trigger point sensitivity through passive stretching. While their outcomes align with the benefits observed in our Group B, our study concluded that manual compression (Group A) not only improved muscle function but also resulted in more substantial pain reduction (15). Similarly, Dibai-Filho et al. (2017) and Parab et al. (2020) explored the effects of combined modalities such as ultrasound and diadynamic currents, alongside myofascial release and cryo-stretching, which further underline the diversity of effective treatments for chronic neck pain and myofascial trigger points (16, 17).

Despite the encouraging results, this study has certain limitations. The exclusion of therapies such as dry needling or phonophoresis, which have shown promising results in other studies, may have restricted our understanding of the full potential of combined treatment strategies. Additionally, the single-blinded nature of the trial could introduce bias in patient reporting and outcomes assessment. Future research could benefit from incorporating these modalities and employing a double-blinded design to enhance the validity of the findings.

This study's strengths lie in its structured approach and the clear delineation of outcomes between two common, yet distinctly different, treatment modalities. The findings contribute valuable insights to the clinical management of myofascial trigger points, suggesting a preference for manual compression in reducing the severity and frequency of cervical pain among office workers. However, as with all therapeutic interventions, individual responses may vary, and what proves most effective in a clinical trial setting may need adjustment in day-to-day clinical practice to cater to individual patient needs and preferences. This reinforces the necessity for clinicians to remain adaptable and responsive to the specific conditions and responses of their patients.

CONCLUSION

This study conclusively found that manual compression was more effective than manual stretching in alleviating pain and enhancing range of motion in the levator scapulae and upper trapezius muscles. These results align with other research that has shown similar benefits using various myofascial treatment techniques like pressure release, phonophoresis, and dry needling. The implications of these findings suggest that incorporating manual compression into the therapeutic regimens for individuals suffering from myofascial pain could significantly improve treatment outcomes. Clinicians are encouraged to consider these results when designing treatment plans for patients with myofascial trigger points, potentially integrating a combination of effective therapies to achieve optimal results in pain management and functional improvement.

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Journal of Health and Rehabilitation Research 2791-156X JHRR

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