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Comparison between Effects of Ischemic Compression Therapy and Deep Friction Massage Therapy for Trigger Points in Neck and Upper Back

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Author`s Contribution

[1]Conception and design, Collection and assembly of data,Drafting of the article Critical revision of the article for important intellectual content
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A B S T R A C T

Objective: To evaluate the comparative effects of two manual techniques (1) ischemic compression and (2) deep friction massage on myofascial trigger points in the area of the neck and upper back and determine its effects in managing pain, disability and ROM.

Materials and Methods: This study was a randomized clinical trial conducted in TUF (The University of Faisalabad), GCUF (Government College University Faisalabad), and AUF (Agriculture University Faisalabad), Pakistan from January 2017 to June 2017. Based on inclusion criteria, total of 36 female students of different universities were selected and randomly allocated into two groups by lottery method. One group received ischemic compression therapy and the second group received deep friction massage. Twelve treatment sessions were given in four weeks on alternative days. The duration of the study was 6 months. Pre-treatment and post-treatment measurements were taken.

Results: The greatest improvement has shown by ischemic compression therapy with NPRS mean 1.17±1.098and NDI mean 16.67±5.531respectively with a P-value=0.00at the end of treatment while the cervical ROM was equally enhanced in both treatment groups.

Conclusion: This research concludes that IC (ischemic compression) is more effective than the DFM (deep friction massage) in patients with MTrP's in the neck and upper back for decreasing pain and disability. But for increasing cervical ROM, both therapeutic approaches are equally useful.

Introduction

The myofascial trigger point is a term defined as a firm, confined, and pressure-sensitive point which is present in the muscles or connective tissues. This spot is often sensitive to local or radiant pain on palpation. It is not reported by a medical specialty. Consequently, according to the advancement of sponsored researches into the musculoskeletal system, the causes of pain due to TPs are not a concern for the specialty of medicine, therefore the primary education or practice regarding the identification and management of MTrPs is hardly ever available.[1,2,3]

Myofascial trigger points are more often present in postural muscles like in the shoulder, neck, pelvis, or leg. The causes of pain in trigger points are due to acute stress or overburden of the muscle affected by both the isotonic or isometric activity and bad posture. Although research has shown that myofascial trigger points are linked to muscular involvement such as trigger points

present in upper trapezius has a strong relationship with cervical issues. It affects cervical ROM and neck posture.[4,5] Different measuring tools or instruments have been used for diagnosing MTrPs like EMG (electromyography), PA (pressure algometry), and DP (Digital palpation).[6, 7] Multiple treatment approaches were used for treating the root cause of trigger points but it is still under discussion. These include analgesic medicines, cryotherapy, heat therapy, needling, dietary modification, electrical modalities and therapeutic interventions.[8-11]

DFM (Deep friction massage) has been developed by Cyriax. This technique aims to preserve mobility within the ligament, tendon, muscle and to avoid the development of adhering scars.[12]

IC (Ischemic compression) is an application used for the inactivation of MTrPs by applying sustained pressure on the trigger points and also release the muscles spasm.[14] This research aimed to evaluate the comparative effects of deep friction massage and ischemic compression on trigger points in cervical and upper back muscles and find out which one is a more effective approach.

Methodology

This study was a randomized clinical trial conducted in TUF (The University of Faisalabad), GCUF (Government College University Faisalabad), and AUF (Agriculture University Faisalabad), Pakistan from January 2017 to June 2017. 40female students were selected through convenient sampling from which 4 didn't give follow up. The inclusion criteria included 18 to 25 years of age, ATPs (active trigger point)in Upper trapezius, supraspinatus, rhomboids, splenius capitis and splenius cervicis muscles, NPRS score is more than three over ten and exclusion criteria included other neurological deficits, orthopedic issues, and vascular impairments. Total 36 (n=36) female students were randomly allocated by the lottery method into two groups (DFM and IC group). 18 subjects received Deep friction massage while the other 18 subjects received Ischemic compression therapy. NPRS, Goniometer, and NDI were used as assessment tools. The NPRS is a segmented digital numeric version of the VAS (visual analog scale), in which an interviewee selects an integer (0-10), which best reflects his/her pain intensity. The NDI is a measuring tool for disability in the neck, while Goniometer is used as a standard tool for measuring ROM. A hot pack was applied for fifteen minutes in both groups as a baseline treatment for managing pain before treatment sessions. In ischemic compression therapy group, the pressure was applied with thumb on the trigger point for 60 seconds and repeat this procedure for three times with fifteen-sec rest interval in each session while in the second group, Deep frictional massage was applied perpendicular to the muscle fibre for at least seven minutes on MTrPs. Twelve treatment sessions were given in four weeks on alternative days. Pre-treatment and post-treatment measurements were taken. For data analysis, SPSS version 20 was used.

Results

A paired sample t-test and independent t-test were used for data analysis. In Table I, the paired sample t-test shows a significant result as with p-value=0.00 in the post-treatment session. This depicts the fact that pain and disability were improved by using both treatments within groups, but the Ischemic compression therapy group has shown greater improvement than deep friction massage group with the mean of NDI and NPRS 16.67±5.531 and 1.17± 1.098 respectively at the end of treatment.(Table II)

Table I: Paired sample t-test for NDI & NPRS (within-group analysis)

Variables	Deep Friction Massage group Mean ± SD	P-value	Ischemic Compression group Mean ± SD	P-value
Pre NDI	37.28 ± 11.447	0.00	40.22±14.498	0.00
Post NDI	23.61± 6.904		16.67±5.531	
Pre NPRS	6.22±1.003	0.00	6.11± 1.023	0.00
Post NPRS	2.83±1.200		1.17± 1.098	

DFM: Deep Friction Massage IC: Ischemic Compression

Table II: INDEPENDENT T-TEST(between groupanalyses)

Variables	Mean ± SD	P-value
NDI (DFM)	23.61±6.904	0.002
NDI (IC)	16.67±5.531	
NPRS (DFM)	2.83±1.200	0.00
NPRS (IC)	1.17±1.098	

Ischemic Compression group showed significant improvement in pain and disability with NDI and NPRS mean 16.67±5.531 and 1.17±1.098 at the end of treatment sessions which shows that it is a more effective

treatment than deep friction massage therapy for treating MTrPs.

The paired sample t-test shows a significant result in the post-treatment session. The results showed that ROM was equally improved in both groups. In Ischemic compression therapy group, ROM mean of Cervical flexion 45.28± 2.697, Cervical extension 40.00± 3.835, Left side flexion 35.83± 3.930, Right side flexion 34.44± 3.792, Left rotation 80.83 ± 4.287 and Right rotation78.33± 4.537 respectively and for deep friction massage group, R OM mean of Cervical flexion45.56± 3.792, Cervical extension 38.89± 2.742, Left side flexion 35.83 ± 3.930, Right side flexion 34.44± 4.501, Left rotation 78.89 ± 5.830and Right rotation76.39± 6.137respectivelyon the last session of treatment. (Table III)

Table III: Paired sample t-test for cervical ROM (within-group analysis)

Variables	Deep Friction Massage group (Mean ± SD)	P-value	Ischemic Compression group (Mean ± SD)	P-value
Pre CF	39.83± 8.466	.010	37.89± 5.603	.000
Post CF	45.56± 3.792		45.28± 2.697	
Pre CE	36.94± 5.724	.185	36.94± 5.185	.004
Post CE	38.89± 2.742		40.00± 3.835	
Pre LSF	27.50± 5.216	.000	26.22± 7.960	.000
Post LSF	35.83± 3.930		35.83± 3.930	
Pre RSF	27.78± 6.691	.001	25.44± 7.594	.000
Post RSF	34.44± 4.501		34.44± 3.792	
Pre LR	61.39± 10.404	.000	62.22± 10.741	.000
Post LR	78.89± 5.830		80.83± 4.287	
Pre RR	63.33± 12.603	.000	64.17± 11.408	.000
Post RR	76.39± 6.137		78.33± 4.537	

In Table IV, the statistical test shows a significant result in the post-treatment session. Results showed that ROM was equally improved in both groups. In Ischemic compression therapy group, ROM mean of Cervical flexion 45.28± 2.697, Cervical extension 40.00± 3.835, Left side flexion35.83± 3.930, Right side flexion34.44± 3.792, Left rotation80.83± 4.287 and Right rotation78.33± 4.537 respectively and for deep friction massage group, ROM mean of Cervical flexion 45.56± 3.792, Cervical extension 38.89 ± 2.742, Left side flexion35.83± 3.930, Right side flexion34.44± 4.501, Left rotation78.89± 5.830 and Right rotation 76.39± 6.137 respectively at the end of treatment. So, cervical ROM was increased with the use of both techniques.

Table IV: INDEPENDENT T-TEST(between groupanalyses)

Variables	Mean ± SD	P-value
CF (DFM)	45.28± 2.697	.802
CF (IC)	45.56± 3.792	
CE (DFM)	40.00± 3.835	.324
CE (IC)	38.89± 2.742	
LSF (DFM)	35.83± 3.930	.210
LSF (IC)	35.83± 3.930	
RSF (DFM)	34.44± 3.792	1.00
RSF (IC)	34.44± 4.501	
LR (DFM)	78.89± 5.830	.206
LR (IC)	80.83± 4.287	
RR (DFM)	76.39± 6.137	.287
RR (IC)	78.33± 4.537	

DFM: Deep Friction Massage IC: Ischemic Compression

Discussion

The principal clinical characteristic of MPS (Myofascial Pain Syndrome) is known to be myofascial trigger points (MTrPs). Myofascial trigger points consist of the spot sensitivity within a tight strap of muscle fibers, which induces local and referred pain.[1] Myofascial Pain Syndrome, the clinical analysis relies on the proper diagnosis of an MTrP. Different approaches are used for trigger inactivation and provide comfort from a painful condition that includes electrotherapy, needle therapy and manual therapy etc.[6, 9]

This study showed that the severity of pain and disability score in both treatment groups was improved and the cervical ROM was also improved by the following treatment. Although it has been proved by the current study that the most effective therapeutic intervention for reducing pain and disability was ischemic compression, while the neck ROM in both classes has been improved equally.[15] The basic mechanisms for pain relief and improvement of ROM during Ischemic Compression are reactive hyperemia and sarcomeres equalization.[16,17]

Another study found that patients with a combination of ischemic compression& self-stretching showed a higher physical function and a higher decline in pain as compared to those who are given only a self-stretching protocol. Self stretching alone has the short-term effects of decreasing pain in those individuals who have trigger points in the upper back.[18, 19]A study of the efficacy of ischemic pressure led to an increase in the threshold for pressure pain in the patients in early sessions treated with it. Subjects indicated that MTrPs

were substantially reduced after four Backnobber II sessions. This research was the first step towards the development of a strategy to better use this method in controlling myofascial trigger points.[19]

A randomized control trial report showed that inactive MTrPs (myofascial trigger points), PPT (pain pressure threshold), QOL (quality of life), movements of neck and impairments were decreased effectively with the help of IC (ischemic compression) and FM (friction massage).[20] Another research showed the results of DFM (deep friction massage) on cervical muscles on PPT (pain pressure threshold) over MTrPsin chronic neck pain. The outcome measures after six weeks of treatment with Deep friction massage and deep cervical flexor training have resulted in a substantially lower score of pain and impairment levels on NDI. For splenius capitis, levator scapulae, or upper trapezoidal muscles there were mild improvements in the PPT over MTrPs.[21]

Another randomized control trial showed significant improvement in NDI score or NPRS score after 12 week's intervention with ischemic compression. In ischemic compression group, 75% patients reported improvement (from mild to full recovery) while 25% recovery seen in massage group.[22]

Conclusion

This research concludes that IC (ischemic compression) is more effective than the DFM (deep friction massage) in patients with MTrP's in the neck and upper back for decreasing pain and disability. But for increasing cervical ROM, both therapeutic approaches are evenly useful.

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