Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i8.6986

EFFECTS OF INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION (IASTM) ON TRIGGER POINTS OF THE CERVICAL AND LUMBAR REGION AMONG SEDENTARY INDIVIDUALS

Mohabbat Ali[1*], Basit Ansari[2], Nazish Rafique[3], Asim Mahmood[4]

[1*]HOD, Physical & Rehabilitative Medicine, Asst. Prof. Memon College of Physical & Rehabilitative Medicine
[2]Chairperson HPESS, University of Karachi-Pakistan
[4]HOD, Physiotherapy, Sindh Institute of Urology and Transplantation

ABSTRACT

Background:

Myofascial pain is defined as a musculoskeletal condition that causes discomfort in both the muscular region of the body and the surrounding connective tissue. This discomfort might be confined to a specific point or extend across a wider area, and it can also exhibit itself through several trigger points.

This study explores how Instrument-Assisted Soft Tissue Mobilization (IASTM) impacts trigger points in the cervical and lower back of sedentary adults, particularly focusing on myofascial pain, which affects women more than men and can lead to musculoskeletal pain. Considering the effect of these trigger points, the research compared the effectiveness of combining IASTM with physical therapy against using conventional physical therapy alone.

Methodology

A randomized controlled trial study conducted at a Memon Medical Institute Hospital, Karachi-Pakistan. The research included patients both male and female between the age of 18 and 55 years who were experiencing cervical and lumbar region pain caused by active trigger points. The treatment group received myofascial release treatment using the IASTM technique with the M2T Blade along with conventional physical therapy. Standard data collection tools and techniques were employed.

Result

Findings indicated that IASTM, when combined with targeted exercises and conventional therapy, significantly reduced trigger points and improved symptoms in cervical and lumbar regions. These results were confirmed by statistical analyses performed using SPSS version 23, demonstrating the higher efficacy of IASTM over traditional therapy alone.

Conclusion

Treatment with IASTM (M2T Blade) was found to be more effective in reducing myofascial trigger points and discomfort in the cervical and lumbar regions than conventional therapy alone.

Key Words: IASTM, Trigger Points, cervical pain, lumbar pain, soft tissue mobilization, myofascial release.

INTRODUCTION

According to Giamberardino MA et al. (2011), myofascial pain is a musculoskeletal disorder that produces pain in the body's adjacent connective tissue as well as the muscular region (1). This pain may be localized or distributed throughout a larger region, and it may manifest through multiple trigger points. These trigger points are incredibly sensitive spots in the muscles that, when touched, cause pain and radiate it to surrounding regions (2). Myofascial pain can affect men and women equally, although it affects women more frequently. Prolonged musculoskeletal discomfort has been associated with elevated depressive symptoms, which are usually accompanied by sleep disturbances and difficulties focusing when handling everyday stressors (3) (4). Furthermore, it may worsen the symptoms of other chronic conditions like diabetes, hypertension, and heart disease, which call for continual care to maintain the best possible regulation. Myofascial pain syndrome is a prominent cause of pain in the cervical region, whether it is isolated or extends to adjacent areas (1).

Physical therapists employ IASTM (Instrument-Assisted Soft Tissue Mobilization) tools, which are composed of finest surgical stainless steel AISA 304 (1.403), for relieving fascial structures (3). Because it resonates, stainless steel is the best material for IASTM Tools. By stroking the outermost layer of skin with the instrument, one can evaluate the state of the tissue. (5).

Significance of the Study

The presented study emphasizes at how the IASTM treatment affects inactive people's cervical and lumbar trigger points. IASTM is an effective technique for treating soft tissue disorders. The soft tissue mobilization method uses the M2T Blade as an instrument (6). Thus, the purpose of this study is to assess how IASTM affects trigger points and examine whether it may be used as a therapeutic strategy for sedentary people who are suffering pain in the lumbar and cervical regions (7).

Objective

The primary objective of this research was to compare the effectiveness of IASTM combined with physical therapy versus only conventional physical therapy in treating trigger points in the lumbar and cervical regions of sedentary individuals.

DISCUSSION

The focus of this research revolves around investigating the efficacy of (IASTM) on myofascial trigger points located in the cervical and lumbar regions among sedentary individuals. This research was conducted within the Department of Physical and Rehabilitative Medicine at Memon Medical Institute Hospital in Karachi, Pakistan. In this study, a comparison is made among the effects of (IASTM) and conventional physical therapy in contrast to only conventional physical therapy on trigger points located in the cervical and lumbar regions among sedentary individuals.

According to a previous study conducted by Harris et al, myofascial trigger points are hyperirritable spots inside taut bands of skeletal muscles that hurt when compressed, stretched, or stimulated (4). These points frequently cause pain to radiate to other regions that are far away from the original point (8). The research findings are in line with previous studies that highlight the effectiveness of Instrument-Assisted Soft Tissue Mobilization (IASTM) in managing trigger points (9). These collective results strongly support IASTM as an effective intervention for addressing trigger points and related musculoskeletal conditions (10). This research contributes to existing knowledge by confirming IASTM's benefits for treating cervical and lumbar trigger points in sedentary individuals, aligning with and reinforcing prior research in this area. These findings collectively support the effectiveness of IASTM as a valuable intervention for addressing trigger points (11). Overall, the current study contributes to the understanding of the benefits of IASTM as a treatment option for trigger points in the cervical and lumbar areas among sedentary individuals, aligning with previous research in this area (12).

Research Gaps

Current research shows gaps in understanding the segmental anatomy of specific muscles, like the quadratus lumborum and transversus abdominis, with limited information on their origins, insertions, and fascial connections. There's a lack of dissection studies for detailed insights (13). Additionally, there's a dearth of comprehensive studies detailing the relationships and structural characteristics among deep lumbar muscles concerning multi-planar segmental movement. Further investigation is needed to fill these knowledge gaps. (14)

Limitations

By concentrating on sedentary individuals who experience trigger points in their neck and lower back, this study offers new insights. It strongly suggests treating this specific patient population with IASTM in addition to conventional therapies (15). To understand the long-term consequences of IASTM in this setting and to validate these findings, it is essential to draw attention to the need of further research. Future research should examine the technique of IASTM and evaluate its efficacy concerning alternative therapeutic modalities. This would improve our understanding of their true significance and potential (16).

METHODOLOGY

The research included patients between the age of 18 and 55 years who were experiencing cervical and lumbar region pain caused by active trigger points. Various variables were taken, including age, height, weight, and BMI. The study utilized several outcome measures, such as the numeric pain rating scale (NPRS), pain sensitivity questionnaire(PSQ), and modified somatic perception questionnaire(MSPQ). The treatment group received myofascial release treatment using the IASTM technique with the M2T Blade along with conventional physical therapy. Standard data collection tools and techniques were employed (17). The IASTM technique was employed using the M2T Blade in conjunction with conventional treatment techniques and physical therapy for all weak and tight muscles in the cervical and lumbar areas. Each exercise was performed for 10-12 repetitions along with mild stretches for relaxing tight muscles of cervical and lumbar region followed by 3-6 repetitions with 10 seconds hold (18). The study details a systematic qualitative research approach investigating the impact of Instrument-Assisted Soft Tissue Mobilization (IASTM) on trigger points in the cervical and lumbar regions of sedentary individuals (19). The study employs purposive sampling and various assessments including NPRS for pain, PSQ, and MSPQ for functional status evaluation. Specifically targeting sedentary individuals with trigger points, the research prioritizes meticulous data collection and analysis via specific testing methods (19)

Study Design	**Randomized Controlled Trial (RCT)**
Population & Sampling	50 participants both male & female aged 18-55 with cervical and lumbar trigger point pain from a Karachi healthcare setting
Procedure of Enrollment	Qualitative methods & purposive sampling at a Memon Medical Institute Hospital
Evaluation Tools	NPRS, PSQ, MSPQ
Sample Size	Determined by statistical calculations for intended outcome measure (50 participants)
Duration of Study	Spanned one years, employing consistent assessment methodologies in cervical and lumbar regions

Study Design	**Randomized Controlled Trial (RCT)**
Sample Selection Criteria	Inclusion: Ages 18-55, chronic cervical/lumbar pain with active trigger points, NPRS ≥ 3 both male & female
	Exclusion: Trauma, fractures, infections, surgeries, specific medical histories, psychiatric medication
Intervention	Ethically approved random assignment into two groups: Group A (IASTM) and Group B (control)

Intervention	**Group A (Ergon)**	**Group B (Control)**
Participants	25 strokes received IASTM using Ergon tool, Fascializer	25 underwent conventional treatment
IASTM Technique	Tissue mobilization, strokes for trigger points (15 mins)	Hot pack application (15 mins) followed by exercises (15 mins)
Additional Treatment	Manual physical therapy (15 mins) 15-minute hot pack application	Manual physical therapy (15 mins)
Exercise Frequency	Three times a week for six weeks	Three times a week for six weeks
Exercise Duration	45-minute session	45-minute session
Assessment	Baseline and post 6-week treatment period	Baseline and post 6-week treatment period
Goal	Assess effects of IASTM on trigger points	Comparison with conventional treatment

For Group A (Ergon) and Group B (Control), this table lists the precise interventions, methods, additional treatments, frequency and duration of exercise, time frame for assessments, and primary goals.

RESULTS

The results of the study showed that using IASTM in conjunction with targeted exercises and traditional physical therapy produced good results for reducing myofascial trigger points and enhancing symptoms in the cervical and lumbar regions. (18) To ensure a thorough assessment, the data were analyzed using SPSS version 23, which included both descriptive and inferential statistical techniques. For quantitative factors, descriptive statistics including mean, median, standard deviation, and interquartile range were used. The Shapiro-Wilk test was used to assess the data's normality distribution, which informed the choice of parametric or non-parametric testing (18). Relevant parametric and non-parametric statistical tests have been determined for within-group and between-group analyses based on the test results (Table 1).

Table 1: Normality Test (Shapiro-Wilk value)

Variables	P – Value	Normality
NPRS at Baseline	0.000	NP
PSQ at Baseline	0.049	NP
MSPQ at Baseline	0.062	P

Descriptive Analysis

Around 50 in all were selected for the study, and they were split equally into two groups, Group A (IASTM) and Group B (control). The demographic information of the participants showed a mean age of 40.6 ± 10.1 years, along with a range of characteristics related to gender distribution, education level, occupation, and comorbidities including diabetes and hypertension (20).

Fifty patients were included in the trial and split into two groups: Group B (Control) and Group A (IASTM). Considerable insights into the research population were obtained via a thorough demographic analysis (Table 2A).

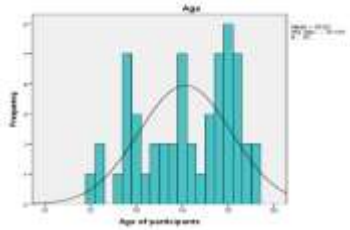
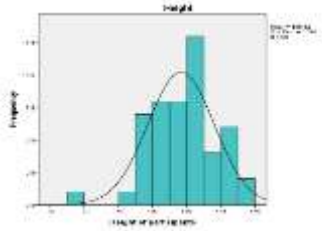
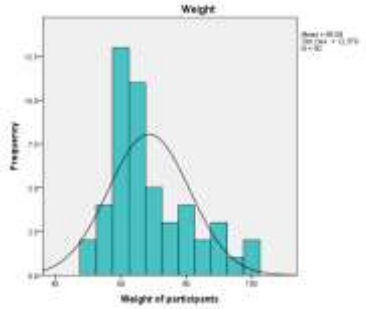
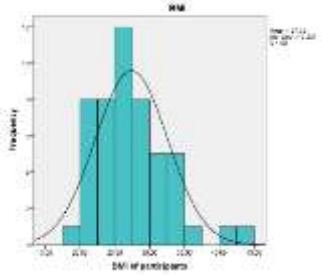
Table 2A: Demographic Data of the Participants

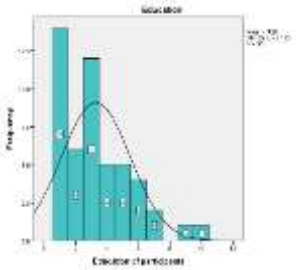
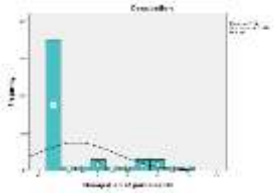
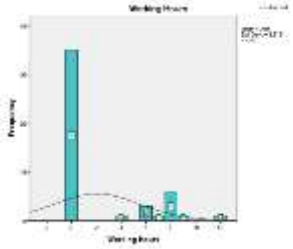
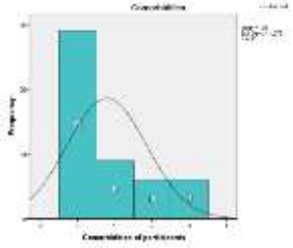
Variable	Study Population	Group A IASTM	Group B Control
Age (Years)	40.6 ± 10.1	39.2 ± 10.9	42.0 ± 9.2
Weight (kg)	68.6 ± 12.4	70.8 ± 17.7	66.4 ± 9.4
Height (cm)	158.3 ± 9.7	163.0 ± 10.0	153.7 ± 7.0
BMI (Kg/m2)	27.3 ± 5.2	26.8 ± 5.6	27.9 ± 4.9
Working Hours	4.4 ± 3.5	3.2 ± 4.0	5.7 ± 2.6

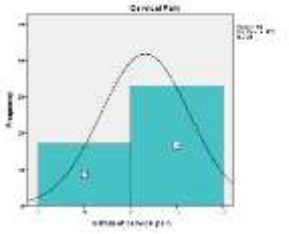
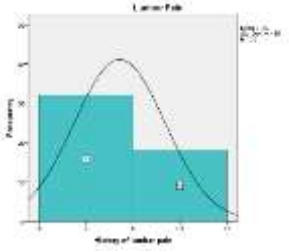
Around 88% of the participants overall were female, while 76% of the IASTM group's members were female compared to 100% of the control group. After completing their matriculation or bachelor's degree, the majority of them had a variety of occupations, the majority being housewives and those working for themselves or in businesses (7).

Participants had considerable comorbidities, with some having both diabetes (18%) and hypertension (12%). Most people (66%) reported having cervical pain; the control group had a significantly higher prevalence (72%). Furthermore, 64% of participants mentioned having lumbar pain; this was more common in the control group (72%).

FINDINGS

Variables	Details
Age	Mean: 40.6 years Standard Deviation: 10.1 Skewness: 0.337 Range: 18-55 years 
Height	Mean: 158.3 cm Standard Deviation: 9.75 Skewness: 0.337 Range: 125-176 cm 
Weight	Mean: 68.6 kg Standard Deviation: 12.4 Variance: 153 Range: 50-100 kg 
Body Mass Index (BMI)	Mean: 27.3 kg/m² Standard Deviation: 5.2 Variance: 27.4 Range: 19.2-46.6 kg/m² 

Variables	Details
Education Level	Matriculation: 28% Intermediate: 12% BS degree: 24% University: 8% 
Occupation	Housewives: 70% Private jobs, business roles students: 6% each Various other occupations each at 2% 
Working Hours	Average: 4.4 hours Standard Deviation: 3.5 Variance: 12.4 Range: 0-12 hours 
Comorbidities	Hypertension: 12% Diabetes: 18% Both hypertension and diabetes: 12% No comorbidities: 58% 

Variables	Details
History of Cervical Pain	Patients with history: 66% Patients without history: 34% 
History of Lumbar Pain	Patients with history: 36% Patients without history: 64% 

This table summarizes various aspects of the research participants' demographics, including age, height, weight, BMI, education level, occupation, working hours, comorbidities, and history of cervical and lumbar pain.

Significant Findings of the Study

The study compared how well (IASTM) and traditional therapy worked together to treat trigger points in inactive people. When compared to conventional therapy alone, patients undergoing IASTM treatment exhibited decreased discomfort, and released myofascial trigger points. The results were consistent with other research showing that IASTM is effective in treating trigger points (11). Analogous research showed favorable results, such as reduced pain, and improved muscular function. Research has demonstrated that IASTM is effective in treating myofascial trigger points and treating musculoskeletal disorders (10).

MSPQ

The baseline mean standard deviation for MSPQ was 0.10 ± 0.07, but by the sixth week, it had fallen to 0.02 ± 0.03. While, by the sixth week, MSPQ had changed from 0.18 ± 0.06 at baseline to 0.06 ± 0.03. These numbers show how MSPQ scores varied before and after the intervention (9).

Clinical Implications

IASTM shows potential as a treatment, with no participant dropouts as a result of the intervention. In patients with cervical and lumbar pain, it is a useful addition to conventional therapy, improving pain control and releasing myofascial trigger points (13). Considering IASTM as a skill-based intervention delivered by skilled professionals, this data helps health care providers incorporate it into rehabilitation programs (13).

With respect to the data, I will produce a table that summarizes Group A and Group B's MSPQ scores both before and after the intervention. The changes seen in both groups will be displayed in this table.

Here's a table summarizing the MSPQ scores for Group A and Group B:

GROUP	ASSESSMENT	BASELINE (Mean ± SD)	6th week(mean ± SD)
A	MSPQ	0.10 ± 0.07	0.02 ± 0.03
B	MSPQ	0.18 ± 0.06	0.06 ± 0.03

This table presents the mean and standard deviation (SD) of MSPQ scores for both Group A and Group B at baseline and after the 6th week. It effectively demonstrates the changes observed in the scores between the two time points for each group.

CONCLUSION

IASTM technique with M2T Blade was found to be more effective and showed a marked improvement in treatment of myofascial trigger points and pain in the cervical and lumbar regions when compared to individuals who received just conventional therapy, with those who had IASTM treatment along with physical therapy.

References

1. Giamberardino MA,AG,FA,CR. Myofascial pain syndromes and their evaluation.. Best practice & research Clinical rheumatology. 2011; 25(2): 185-198.
2. Kankaanpää M TSAOHO. The efficacy of active rehabilitation in chronic low back pain: effect on pain intensity, self-experienced disability, and lumbar fatigability. Spine. 1999 May; 15;24(10): 1034-42
3. Aker PD GAGCPP. Conservative management of mechanical neck pain: systematic overview and meta-analysis. Bmj.. 1996 Nov ;(7068): 23;313.
4. Fernández-de-Las-Peñas C SDCMPJ. The role of myofascial trigger points in musculoskeletal pain syndromes of the head and neck. Current pain and headache reports. 2007 Oct; 11: 365-72
5. Osailan A JATKAM. Instrument assisted soft tissue mobilization (IASTM) versus stretching: A comparison in effectiveness on hip active range of motion, muscle torque and power in people with hamstring tightness.. Journal of bodywork and movement therapies. 2021 Jul ; 200(6)
6. Nourbakhsh MR AA. Relationship between mechanical factors and incidence of low back pain.. Journal of Orthopaedic & Sports Physical Therapy. 2002 Sep; 32(9): 447-60
7. Cheatham SW BRKE. Instrument assisted soft-tissue mobilization: a commentary on clinical practice guidelines for rehabilitation professionals. International journal of sports physical therapy.. 2019 Jul; 670(4): 14.
8. H. H. Hemodynamic Effects of Graston Technique on Trigger Points in the Upper Trapezius in Patients with Neck Pain.. Illinois State University. 2020
9. Fousekis K EKTEGPMKAPKDBVTE. Can the application of the Ergon® IASTM treatment on remote parts of the superficial back myofascial line be equally effective with the local application for the improvement of the hamstrings' flexibility? Journal of physical therapy science.. 2019; 31(7): 508-11
10. Gamboa AJ CDMJFTMR. Functional movement analysis before and after instrument-assisted soft tissue mobilization.. International journal of exercise science.. 2019; 12(3): 46
11. Nightingale RW RWMB. The effects of padded surfaces on the risk for cervical spine injury.. Spine. 1997 Oct ; 15;22(20): 2380-7
12. Nightingale RW CDAARJMB. Inertial properties and loading rates affect buckling modes and injury mechanisms in the cervical spine.. Journal of biomechanics.. 2000 Feb; 1;33(2): 191-7
13. Rukhin A SJNJSMBELSLMVMBDHADJ. A statistical test suite for random and pseudorandom number generators for cryptographic applications.. US Department of Commerce. Technology Administration, National Institute of Standards and Technology. 2001 May 15.
14. Jemmett RS MDAA. Anatomical relationships between selected segmental muscles of the lumbar spine in the context of multi-planar segmental motion: a preliminary investigation.. Manual therapy.. 2004 Nov; 9(4): 203-10

15. Portillo-Soto A ELDTPC. Comparison of blood flow changes with soft tissue mobilization and massage therapy.. The Journal of Alternative and Complementary Medicine.. 2014 Dec 1; 20(12): 932-6.
16. Philadelphia Panel Members CSEAJARBRCADBGAHSRRSP. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation intervenions for low back pain. Physical therapy. 2001 Oct ; 1641-74.(10): 1;81
17. Roddey TS OSGS. The effect of pectoralis muscle stretching on the resting position of the scapula in persons with varying degrees of forward head/rounded shoulder posture.. Journal of Manual & Manipulative Therapy.. 2002 Jul; 1;10(3): 124-8.
18. Martin BI DRMSTJCBHWSS. Expenditures and health status among adults with back and neck problems. Jama. 2008 Feb; 13;299(6): 656-64.
19. Jette AM SKHSDK. Physical therapy episodes of care for patients with low back pain.. Physical therapy.. 1994 Feb; 1;74(2): 101-10
20. Seffrin CB CNRMGSA. Instrument-assisted soft tissue mobilization: a systematic review and effect-size analysis.. Journal of athletic training. 2019 Jul ; 1;54(7): 808-21.