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Comparative Efficacy Of Percussive Massage Gun And Myofascial Release On Lumbar Fascia Trigger Points In Lumbar Myofascial Pain Syndrome – Interventional Study

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ABSTRACT

Background: Lumbar myofascial pain syndrome (LMPS) is a common musculoskeletal disorder characterized by chronic pain, stiffness, and limited mobility in the lower back region. Fascial trigger points play a crucial role in the pathophysiology of LMPS, contributing to pain, inflammation, and muscle dysfunction. Traditional treatment for LMPS often focus on pharmacological interventions, physical therapy, and manual therapies like myofascial release (MFR). Recently, percussive massage gun gained popularity as a novel treatment modality for musculoskeletal pain and inflammation.

Methodology: Interventional study conducted on 30 lumbar myofascial pain syndrome patients, participants age ranged from 18-43 years with both genders were included in this study. Myofascial release technique was applied on 15 participants which was group A, and percussive massage gun was applied on 15 participants which was group B, along with conventional treatment in each group. The treatment was given two sessions per week for four weeks, all participants were evaluated pre and post treatment by wagner FPX25 digital algometer was utilized to measure pain pressure threshold, Quebec Back Pain Disability Scale (QBPDC) to measure functional disability of low back pain, Modified Schober's test was used to calculate the flexion and extension of lumbar spine.

Results: This study showed that, Group A significantly lowered disability score than group B, mean value of group A is 22.80 andgroup B is 29.73 ($p = 0.0153$) andgroup A more effectively reduced in pain pressure threshold than group B, mean value of group A is 1.81 and mean value of group B is 2.28($p = 0.0284$). Furthermore, group A also showed great improvement in lumbar ranges than group B, lumbar flexion mean value of group A is 6.10 and mean value of group B is 5.28($p = 0.0009$) and lumbar extension mean value of group A is 2.24 and mean value of group Bis 2.00 ($p = 0.0169$). **Conclusion**: Myofascial Releaseand Percussive massage gunboth interventions were effective in reducing pain, improving lumbar mobility, and decreasing disability in individuals with Lumbar Myofascial Pain Syndrome. However, Myofascial Release show significantly greater improvement across all outcome measures compared to the percussive massage gun.These findings shows that Myofascial release(MFR) should be considered a more effective therapeutic option for managing lumbar myofascial pain syndrome (LMPS).

Keywords: *percussive massage gun, myofascial release (MFR), Lumbar myofascial pain syndrome (LMPS), Trigger points (TrPs)*

1. INTRODUCTION

LOW BACK PAIN Low back pain can be categorized as nonspecific back pain associated with symptoms that are induced by distinct pathophysiological mechanisms of non-spinal or spinal origin like Hip disorders, pelvic organ diseases such as prostatitis and endometriosis, vascular such as an aortic aneurysm are examples of non-spinal causes of specific low back pain. spinal causes include herniated disc, spinal stenosis, fracture, tumors, infection. [1] LBP, is a major health concern in the modern world. One study found that 62% of people will experience low back discomfort at some point in their lives. The mean point frequency among adults was 32%. [2]

2. MYOFACIAL PAIN SYNDROME

Myofascial Pain Syndrome (MPS) is a condition characterized by severe, ongoing pain in the affected area, along with trigger points (TrPs) that are exacerbated by daily activities. Based on clinical characteristics, TrPs are classified as either latent or active. [2] " Myofascial trigger points (MTrPs) at muscle, fascia, or tendinous insertions are the source of myofascial pain syndrome (MPS), a non-articular local musculoskeletal pain condition. Up to 95% of patients with chronic pain issues have myofascial syndrome [3]

PREVALANCE According to some studies, up to 85% of people in the general population suffer from myofascial pain, with rates varying between men and women. However, according to some publications, women are more likely than men to experience myofascial pain. According to some reports, myofascial pain accounts for 85% of back pain and is the most prevalent type of pain. [4]

CLINICAL MANIFESTATIONS MPS and myofascial pain can develop following an injury, chronic strain, microtrauma, Postural abnormalities or improper body mechanics may cause or exacerbate the issue. localized pain, such as numbness, scorching pain, leaping pain, and aberrant sensory perception It shows up as loss of associated muscular coordination, stiffness, weakness, and diminished endurance of the afflicted muscles. [4]

RISK FACTORS Intense cooling of muscles, Mental tension, lack of sleep and Acute muscular damage or ongoing muscle stress, hormonal fluctuations and metabolic abnormalities such as menopause and hypothyroidism, strained muscles, wind-cold moisture. [5]

EXERCISE THERAPY Exercise therapy plays a pivotal role in managing lumbar myofascial pain syndrome. efficacy of targeted stretching and post-isometric relaxation techniques in reducing pain. passive stretching exercises and post-isometric relaxation significantly decreased pain levels in patients with lower back MPS.

ELECTROTHERAPY Modalities of electrotherapy have become popular non-invasive treatments for MPS, providing better functional results and pain reduction. The analgesic benefits of transcutaneous electrical nerve stimulation (TENS).13 Low-intensity ultrasound therapy has shown promise in reducing pain intensity in MPS patients. While hot moist packs are commonly used for pain relief Hot packs relieve myofascial pain by increasing local blood flow through vasodilation, promoting oxygen delivery and waste removal.

MANUAL THERAPY According to earlier studies, manual therapy is one of the most widely utilized treatments for managing MTPs due to its non-invasive, nonpharmacological, affordable, and safe features.

MYOFASCIAL RELEASE Originally developed in osteopathy, myofascial release (MFR) has also been utilized more recently by manual therapists to treat pain and soft-tissue musculoskeletal diseases. Even while MFR includes a variety of therapy approaches, it most frequently refers to a passive approach that solicits feedback from the patient as well as the practitioner.

PERCUSSIVE MASSAGE GUN Recently, handheld percussive massage therapy (PT) has received increasing attention. Percussive massage gun is a equipment for self-massage or therapist treatment, which can usually provide up to 53 Hz percussion frequency, 16 mm amplitude, and various massage heads that can be matched to different body parts.

3. METHODOLOGY

An Interventional analytical study conducted using consecutive sampling method on Participants with lumbar myofascial pain syndrome at Orthopedic Manual Therapy OPD at Dr. D. Y. Patil Medical College Hospital and Research Institute, Kadamwadi, Kolhapur sample size 30 study subjects. study subjects were selected fulfilling inclusion and exclusion criteria.

Materials: Data collection sheet, Consent form, Digital algometer, Percussive massage gun.

Inclusion Criteria: Participants diagnosed with lumbar myofascial pain syndrome by certified Physiotherapist, Participants between age group of 18 to 43 years, participants of all genders, participants having low back myofascial pain from at least 3 months.

Exclusion Criteria Participants with any specific lower back pain condition, Participants with recent history of any lower back surgery, Trauma, fracture. and malignancies of lumbar spine.

PROCEDURE The study protocol approval was taken by college research protocol committee on 23rd September 2024. The study was presented before institutional ethics committee for further approval. Ethical approval was approved reference no (D. Y. Patil university deemed to be university /IEC.175/2025), participants were screened on the basis of inclusion and exclusion criteria. Initially, a brief demographic data including name, age, gender, etc. as per data collection sheet recorded. A written as well as informed consent were taken from all the participants. On the basis of Consecutive sampling method, the participants allocated into two groups. Group A had 15 participants and group B had 15 participants each. Digital algometer used to calculate pressure threshold, Modified Schober's test to measure the lumbar flexibility, Quebec back pain disability scale to calculate Functional disability. these outcome measures were assessed before first session in first week

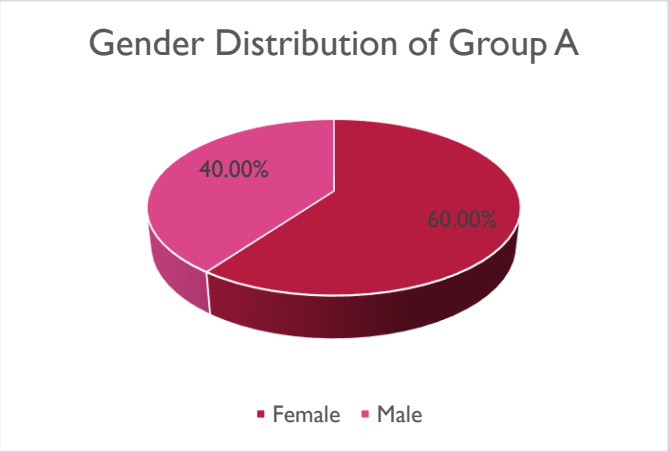
and after the last session of fourth week, the total Period of intervention was four weeks.

4. RESULTS

Demographic distribution:

Group A

FIGURE 1 SHOWS gender distribution in group A, there is 15 participants, frequency of female participants are 9 and frequency of male participants are 6.

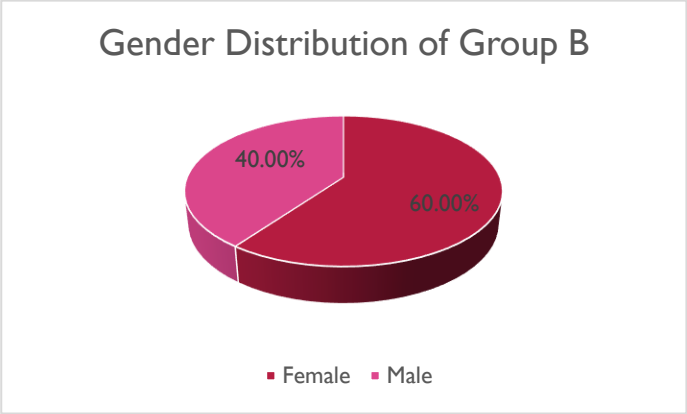


GRAPH NO: 1 Signifies the gender wise classification

Group A, 40% were male, and 60%were female.

Group B

TABLE NO: 2 – following table shows gender distribution in group B, there is 15 participants, frequency of female participants are 9 and frequency of male participants are 6



GRAPH NO: 2 Signifies the gender wise classification of participants in group B.

In Group B 40% were male, and 60 % were female

Outcome measures:

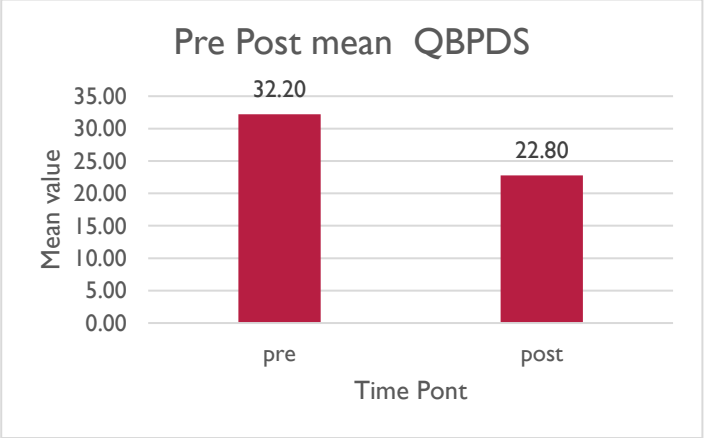
GROUP A:

TABLE NO.-3

outcome		Time Point	Mean	S.D.	P-value
QBPDS		pre	32.20	10.74	1.5977E-05
		post	22.80	6.19	
pressure algometer		pre	2.83	0.54	2.0553E-06
		post	1.81	0.48	
Modified schobers test	flexion	pre	3.83	0.52	1.3251E-10
		post	6.10	0.58	
	extension	pre	1.81	0.45	0.0016
		post	2.24	0.16	

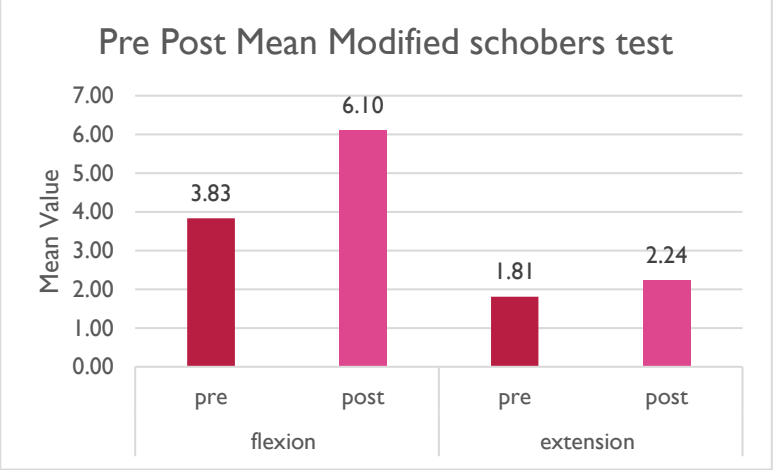
Above table shows Pre and post outcome measures value of group A

The mean score on the Quebec Back Pain Impairment Scale (QBPDS) decreased significantly in mean value from 32.20 ± 10.74 before treatment to 22.80 ± 6.19 after treatment (p = 1.5977), result shows decrease in impairment and improvement in functional abilities. The pressure pain threshold dropped mean value from 2.83 ± 0.54 to 1.81 ± 0.48 (p = 2.0553),. Increased spinal mobility was demonstrated by Modified Schober's Test, as flexion increased from 3.83 ± 0.52 to 6.10 ± 0.58 (p = 1.3251) and extension increased from 1.81 ± 0.45 to 2.24 ± 0.16 (p = 0.0016). These findings demonstrate the effectiveness of the intervention in lowering pain and improving lumbar spine range of motion.



GRAPH NO 4: Signifies the pre and post qubec back pain disability score

Group Aresults on the Quebec Back Pain Disability Scale (QBPDS) both before and after the intervention. The mean score before intervention was 32.20, and after intervention is 22.80. With a p-value of 1.5977.



GRAPH NO 5: Signifies the pre and post flexion and extension ranges.

In group A post treatment flexion and extension ranges are improved. in the flexion pre mean value is 3.83 and post mean value is 6.10 and extension pre mean value is 1.81 and post mean value is 2.24.

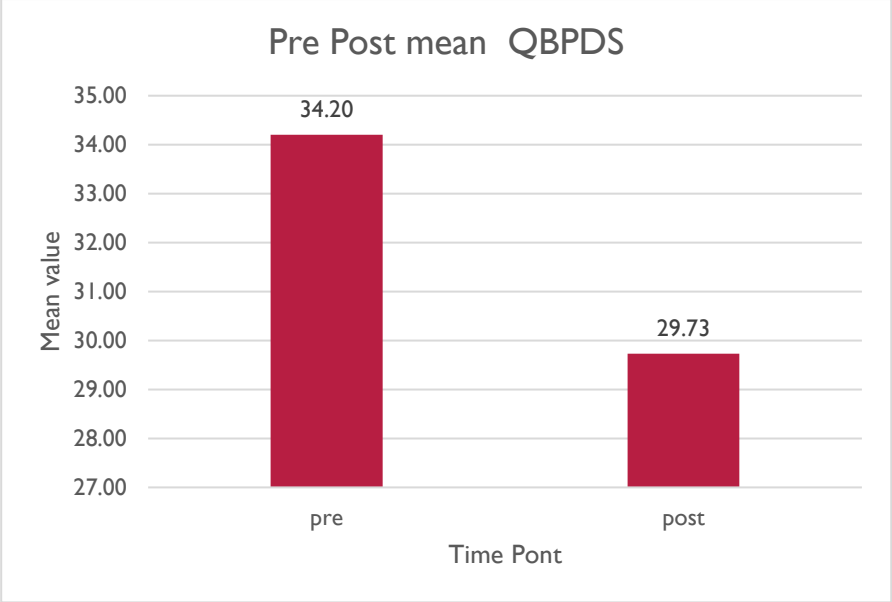
GROUP B:

TABLE NO. 4

outcome		Time Point	Mean	S.D.	P-value
QBPDS		pre	34.20	11.44	0.0185
		post	29.73	10.03	
pressure algometer		pre	2.73	0.81	0.0015
		post	2.28	0.78	
Modified schobers test	flexion	pre	4.23	0.85	0.0001
		post	5.28	0.73	
	extension	pre	1.74	0.56	0.0220
		post	2.00	0.37	

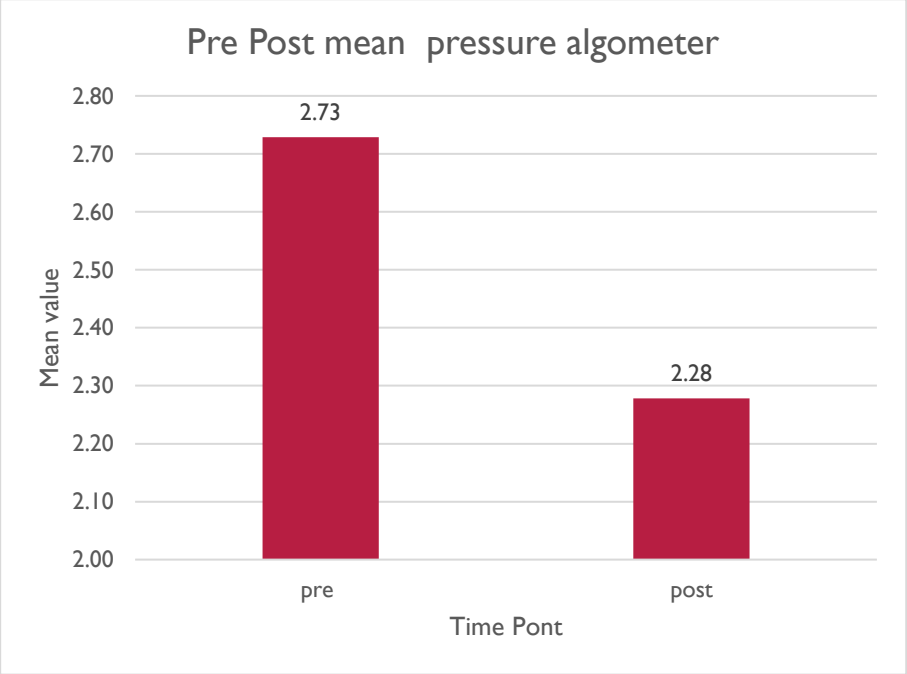
Above table shows pre and post values of outcome measures

Quebec Back Pain Disability Scale (QBPDS) pre intervention mean is 34.20 ± 11.44 post intervention mean is 29.73 ± 10.03 ($p = 0.0185$), suggesting a moderate but significant decline in disability. A decrease in pain pressure threshold are suggested by the pressure algometer pre intervention mean is 2.73 ± 0.81 and post intervention mean is 2.28 ± 0.78 ($p = 0.0015$). The Modified Schober's Test, which measures lumbar range of motion, also showed a notable improvement. Pre intervention flexion mean is 4.23 ± 0.85 and post intervention mean is 5.28 ± 0.73 ($p = 0.0001$), pre intervention extension mean is 1.74 ± 0.56 and post intervention extension mean is 2.00 ± 0.37 ($p = 0.0220$), extension is improved, these results shows that increase in functional disability, decrease in pain pressure threshold, and increase lumbar mobility.



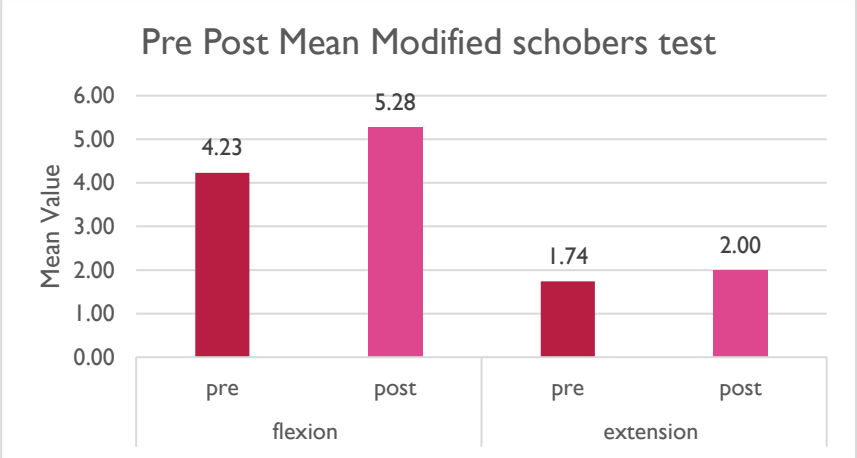
GRAPH NO 6: Signifies the pre and post qubec back pain disability score

In group B post treatment disability score has been reduced pre intervention mean is 34.20 and post intervention mean is 29.73.



GRAPH NO 7: Signifies the pre and post pressure by pressure algometer

In group B post treatment pressure is slightly reduced mean value of pre intervention is 2.73 and post intervention mean value is 2.28



GRAPH NO 8: Signifies the pre and post flexion and extension ranges

In group B post treatment ranges are improved. pre intervention mean of flexion is 4.23 and post intervention mean is 5.28 and pre intervention extension mean value is 1.74 and post intervention mean value of extension is 2.00

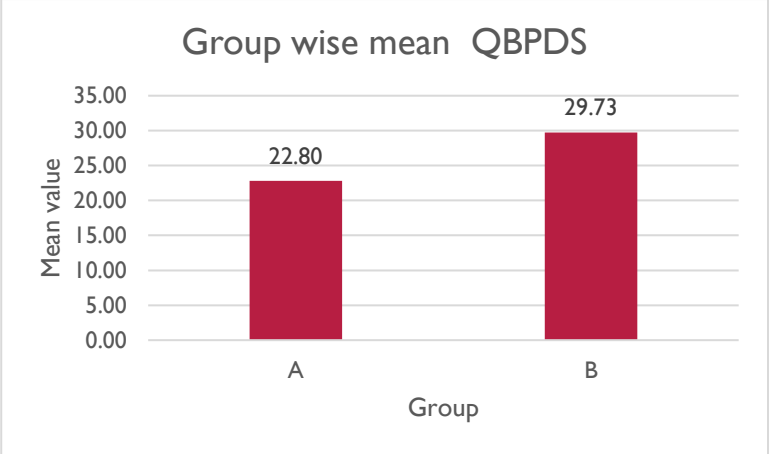
Within-Group Analysis:

A paired t-test was conducted to assess the effect of the intervention within each group.

TABLE NO: 5

outcome		Group	Mean	S.D.	P-value
QBPDS		A	22.80	6.19	0.0153
		B	29.73	10.03	
pressure algometer		A	1.81	0.48	0.0284
		B	2.28	0.78	
Modified schobers test	flexion	A	6.10	0.58	0.0009
		B	5.28	0.73	
	extension	A	2.24	0.16	0.0169
		B	2.00	0.37	

The table compares group A and group B for lumbar myofascial pain syndrome based on the outcome measures. Group A mean value is 22.80 and a standard deviation is 6.19. p-value is 0.0153. Group B mean value is 29.73 and standard deviation is 10.03 for the QBPDS measure, Group A mean value is 1.81 and SD is0.48on the pressure algometer, whereas Group B mean value is 2.28 and SD is 0.78. The p-value is 0.0284, which also indicates a significant difference. Group A Schober's Test mean is 6.10 and SD is 0.58. Group B mean value is 5.28 and SD is 0.73, Group A showed improvement in flexion, with a highly significant p-value of 0.0009. and group B p-value is 0.0169, Group A extension mean value is 2.24 and SD is 0.16, and group B mean value is 2.00 and SD is 0.37. According to the findings, Group A performs better than Group B on all outcome.



GRAPH NO 9: Signifies the group wise qubec back pain disability score.

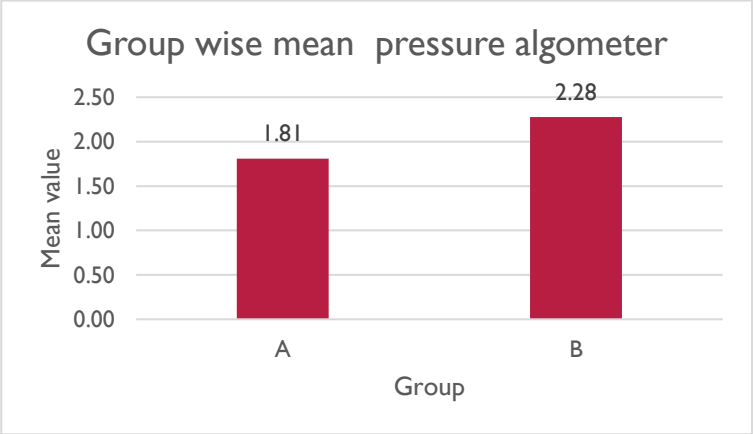
QBPDS (Qubec back pain disability scale)

Group A – pre mean = 32.20±10.74 and post mean = 22.60±6.19, (P value = 1.5677)

Group B - pre mean =34.20± 11.44 and post mean =29.73±10.03, (P value = 0.0185)

Between Groups: A = 22.80, B = 29.73 (P = 0.0153)

Group A showed significantly decreases the disability score.



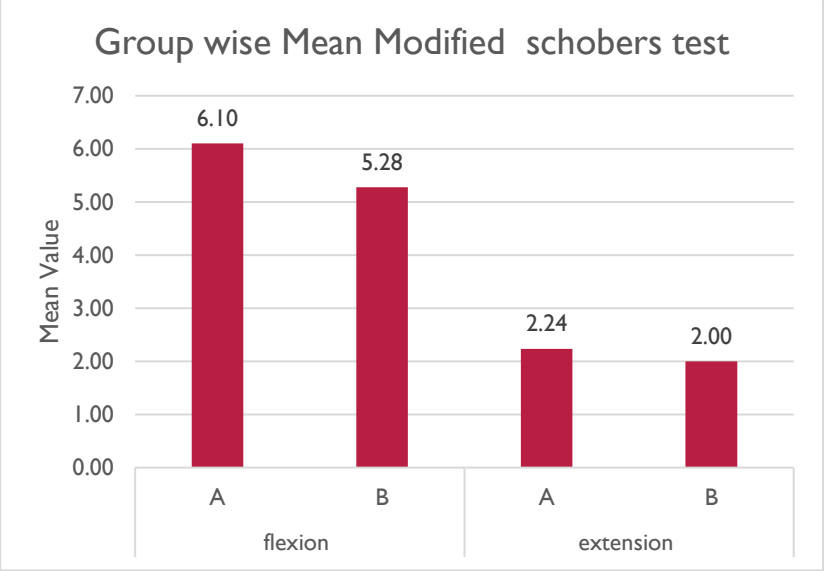
GRAPH NO 10: Signifies the group wise pressure algometer

Group A: Pre = Group A= 2.83±054 group B = 1.81±0.48 (P = 2.0553)

Group B: Pre = Group A= 2.73±0.81 group B= 2.28±0.78(P=0.0015)

Between Groups: A =1.81± 0.48, B = 2.28± 0.78 (P =0.0284)

Group A had better pain reduction



GRAPH NO 11: Signifies the group wise flexion and extension ranges.

Flexion and extension (Range of Motion)

Group A (flexion): Pre = 3.83 ±0.52 → Post =6.10 ± 0.58 (P = 1.325)

Group A (extension); pre= 1.81±0.45 post =2.24±0.16 (p= 0.0016)

Group B (flexion): Pre = 4.23 ± 0.85 → Post = 5.28± 0.73 (P= 0.0001)

Group B (extension): pre =1.74±0.56 post = 2.00±0.37 (P= 0.0220)

Between Groups flexion: A =6.10± 0.58, B = 5.28± 0.73 (P =0.0009)

Between Groups extension: A=2.24±0.16 B=2.00± 0.37 (P=0.0169)

Group A had significantly show better improvement in flexion and extension ranges.

5. DISCUSSION

Myofascial pain syndrome(MPS), it is a condition that affects the muscles and tendons, causes sensory and motor symptoms, and causes autonomic issues due to myofascial trigger points. [3]

Aim of this study was to find out the effectiveness of MFR and percussive massage gun in myofascial pain syndrome patients. 30 participants were included in the study based on inclusion and exclusion criteria, all genders included in the study with age group between 18 to 43 and was diagnosed with low back myofascial pain syndrome. This research applied a 4-week intervention comparing the impact of percussive massage gun and myofascial release on lumbar fascia trigger points in lumbar myofascial pain syndrome. Both groups intervention was 2 times a week. There were 30 participants in this research, with each participant divided into 2 groups, 15 in group A and 15 in group B. Group A received myofascial release along with the conventional protocol and group B received percussive massage gun along with conventional protocol.

Gender distribution

Gender distribution classification in both groups shows frequency of female participants are more than male participants. 40% were male, and 60% were female. According to some publications, prevalence of women are more than men to experience myofascial pain.[4]

Outcomes

The effects of MFR with percussive massage gun on pain pressure threshold by digital algometer, functional disability by qubec back pain disability scale and lumbar range of motion by modified schober's test.

Quebec Back Pain Disability Scale (QBPDS) The Quebec Back Pain Disability Scale measures the functional disability of back pain. Group B mean value (pre 34.20 ± 11.44) and (post 29.73 ± 10.03) (p = 0.0185), whereas Group A decreased more significantly, mean value of group A is (pre 32.20 ± 10.74) and (post 22.80 ± 6.19) ($p < 0.001$).[5], MFR improves tissue extensibility, decreases fascial adhesions, and restores muscle balance, all of which considerably lower functional impairment. MFR probably improved posture, and relieving pain, than percussive massage gun. Conversely, Percussive

massage gun may not produce long-lasting improvements in disability [6] **Pressure Algometer** Both groups showed reductions in pain pressure threshold, although Group A improvement was more than Group B, mean value of group A is (pre = 2.83 ± 0.54) to (post=1.81 ± 0.48) ($p < 0.001$) and group B is (pre= 2.73 ± 0.81) to (post= 2.28 ± 0.78) ($p = 0.0015$). This result suggests that, manual therapies such as MFR may also affect the viscoelastic characteristics of soft tissue and promote descending pain inhibition. Additionally, MFR decreases ischemia and inflammatory mediators, which are major causes of MTrP sensitivity, by decompressing nerve endings and boosting local blood flow [7]

Modified schober's test Group A also showed more effectiveness in lumbar mobility than group B. The flexion and extension of Group A improved significantly. Group A mean value is (pre 3.83 ± 0.52) and (post 6.10 ± 0.58) ($p < 0.001$). Group B mean value is (pre 1.81 ± 0.45) and (post 2.24 ± 0.16) ($p = 0.0016$). Group B also made progress. The superiority of MFR was validated by intergroup comparison in both flexion ($p = 0.0009$) and extension ($p = 0.0169$). Myofascial release increases the temperature of the skin, fascia, and muscle tissues due to friction, and shear stress may be generated by applying direct and sweeping pressure. So MFR helps to improve lumbar flexibility and improve the ranges of lumbar spine.[8] and Percussive massage gun might only provide short-term effect on muscular stiffness. According to recent research, myofascial release (MFR) is more effective than percussion massage therapy at treating lumbar myofascial pain syndrome (MPS). While both Myofascial release and Percussive massage gun have a beneficial effect on lumbar MPS, MFR has a greater influence on pain management and functional enhancement.[9] Myofascial release increases soft tissue elasticity, and breaks fascial adhesions. Conversely, Percussive massage gun may have a short-term effect on muscle tone reduction [10]. Above study shows myofascial release is more effective than percussive massage gun.

6. CONCLUSION

Myofascial Release and Percussive massage gun interventions were effective in reducing pain, improving lumbar mobility, and decreasing disability in individuals with Lumbar Myofascial Pain Syndrome. However, Myofascial Release show significantly greater improvement across all outcome measures compared to the percussive massage gun. Findings shows, that Myofasical release(MFR) should be considered a more effective therapeutic approach for managing lumbar myofascial pain syndrome (LMPS).

REFERENCES

[1] Chiarotto A, Koes BW. Nonspecific low back pain. New England Journal of Medicine. 2022 May 5;386(18):1732-40.

[2] Elshiwi AM, Mohammed AM, Al-Amri AM, Al-Wadei RA, Koura GM. Impact Of Progressive Pressure Technique Versus Traditional Physical Therapy In Treatment Of Patients With Lower Back Myofascial Pain Syndrome: A Randomized Clinical Trial. Journal of Positive School Psychology. 2022 Dec 23;6(11):3032-44.

[3] Elsadek RM, Amin D, Elsayed WH, Helmy Elshafi MH. Effect Of Active Release Versus Myofascial Release Technique In Low Back Myofascial Pain Syndrome. Journal of Pharmaceutical Negative Results. 2023 Feb 1;14.

[4] Lam C, Francio VT, Gustafson K, Carroll M, York A, Chadwick AL. Myofascial pain–A major player in musculoskeletal pain. Best Practice & Research Clinical Rheumatology. 2024 Apr 21:101944.

[5] uarte FC, West DW, Linde LD, Hassan S, Kumbhare DA. Re-examining myofascial pain syndrome: Toward biomarker development and mechanism-based diagnostic criteria. Current rheumatology reports. 2021 Aug;23:1-0.

[6] Shah JP, Thaker N, Heimur J, Aredo JV, Sikdar S, Gerber L. Myofascial trigger points then and now: a historical and scientific perspective. PM&R. 2015 Jul 1;7(7):746-61.

[7] Cheatham SW, Lee M, Cain M, Baker R. The efficacy of instrument assisted soft tissue mobilization: a systematic review. The Journal of the Canadian Chiropractic Association. 2016 Sep;60(3):200.

[8] Yang C, Li Y, Sucharit W, Eungpinichpong W, Huang X. Effects of percussive massage therapy on fascia echo intensity and fascia thickness in firefighters with chronic non-specific low back pain: a randomized controlled trial. BMC Complementary Medicine and Therapies. 2024 Nov 8;24(1):390.

[9] Ożóg P, Weber-Rajek M, Radzimińska A. Effects of isolated myofascial release therapy in patients with chronic low back pain—A systematic review. Journal of Clinical Medicine. 2023 Sep 23;12(19):6143.

[10] Vigotsky AD, Bruhns RP. The role of descending modulation in manual therapy and its analgesic implications: a narrative review. Pain research and treatment. 2015;2015(1):292805.