Combination of Soft Tissue Mobilization Assisted with Instrument (IASTM) Technique and Myofascial Release for Chronic Low Back Pain – Single Case Study

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ABSTRACT

Background: *Pain and limited range of motion with impaired musculoskeletal function in lower lumbar spine area was more frequently reported musculoskeletal problem in now day's sedentary populations who are doing job in information technology field. Myofascial Release (MFR) is a technique that facilitates stretching restricted fascia to improve the movement and flexibility of affected musculature. Application of Soft Tissue Mobilization Assisted with Instrument (IASTM)varies from conventional friction methods and it facilitates more flexibility in affected musculature. Specially designed instruments with alloy materials are taken to apply longitudinal pressure along the course of muscle fibres in IASTM.*
Aim of the Study: *To learn the effect combined application of IASTM and Myofascial Release (MFR) in chronic low back pain patient.*
Data Analysis and Results: *Significant improvement in pain and SLR Range of motion bilaterally after combined intervention of MFR and IASTM.*
Conclusion: *This study outcomes concluded that there is reduction in pain and straight leg raise range of motion in both legs while treating chronic low back pain when physiotherapy intervention were given with combination of Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument (IASTM).*
Originality/Value: *Modified new interventional study to progress in treatment.*
Paper Type: *Case Study Research*
Keywords: Chronic Low Back Pain, Myofascial Release (MFR), Instrument Assisted Soft Tissue Mobilization (IASTM)

1. INTRODUCTION :

Presence of back pain in general should be kept in the overall prevalence of back pain. Number of research articles stated that there is always the presence of low back pain has been very high in any society around the world. More than 75% of human beings in this world might experience lower backache at one time in their life span. Overall presence of low back pain would be in between 15%-45%, with exactly the average would be 30% [1]. Majority of subjects with pain in the lower back come good in quicker time and not having any problems in their day-to-day functional activities. Approximately, 3/4th of the patients with low back pain are recovering by 45 days, and 90% within 3 months. But there is no sure recovery after 3 months in low back pain patients [2].
Orthopaedic and musculoskeletal impairment is the most prevalent impairment with more than 65% of any impairment in human beings [3]. Out of that 50 to 60% would be spine related problem particularly low back pain [3]. In this current digital world this scenario of presence of back pain younger generation is two or three fold more than previous generations.
Low back pain which has been persisting more than 3 months are known as chronic low back pain, and they are multidimensional phenomenon. So that the treatment interventions to cure these problems are also present in multifactorial approach. Advanced interventions to treat lower backache in general and

physiotherapy in particular are also happening in lightening fast now days. Many methods of interventions are less efficient, but at the same time manual therapy approaches, targeted muscle training program, higher function intervention like behavioural therapy and multifocal management of pain and discomfort are all having well supported research publications [4].

Fascia is a very important connective tissue which extends from head and up to sole of the foot surrounding each and entire muscular structure in human body. The fascia is very unique and continuous, covers entire muscle, nerve, bone, vasculature and all organs and it extends to the tissue or cell level. Normally the system of fasciae gives amble support, stress reliving cushioning effect and stability [5].

Fascial stiffness or tightened fasciae is a cell level, functional level and physical level supportive protective action which is very essential to minimize the effect of injury or trauma to the muscle. The collagen structure in fascia becomes very adherent and dense, it loses its flexibility, action limited, becomes resource of tension to the other part of the body and it loses its elastic property. If it is untreated and carried over long it bring restriction in muscle mechanic properties, changing presentation of muscle structure, and reducing muscle strength, aerobic endurance capacity and coordinated motor function. On account of this the subject will be in discomfort, pain and limited activity level [5].

1.1 Myofascial Release effect on Chronic Low Back Pain:

To stretch and elongate the tightened fasciae, hands on technique on soft tissues which surrounds each and every muscle which releases and facilitates the overall activity of muscle as a whole is known as myofascial release (MFR). A prolonged continuous manual pressure is given to the tightened fasciae; after 3 minutes the tissue would attain elongation which gave the way for release which should be felt in providing myofascial release. The intervener should go behind to free the tightened tissue and make into a new advanced level of resistance, then holds and go on. Once few repetitions of myofascial release are given, then the tightened muscle becomes more flexible and pliable by releasing the fasciae itself. That would reduce the causative pain and improves structural and postural orientation and alignment of muscles.

1.2 Soft tissue mobilization assisted with instrument (IASTM) effect on Chronic Low Back Pain:

James Cyriax invented and introduced IASTM - Soft tissue mobilization assisted with instrument which is basically mobilization of soft tissue structures around the muscle in the form of fasciae particularly [6-8]. IASTM is altogether different technique which is not conventional massage techniques which is practiced with friction effect which is either cross or longitudinal. IASTM are delivered through instruments which are specifically made by alloys which are taken to give pressure in the long path of muscle fibres [6-9]. Intervention of IASTM treatment aims at the targeted location of pain which is limiting the functional activities of muscles [9]. If we get more vibrations when applying the IASTM tool and that is understood that there is abnormality in the properties of tissues or cells [10-12].

IASTM are providing notable advantage in mechanical use of it, which makes the therapist to attain deeper transmission of mechanical force than the force produced manually by the hands [8],and which reduces the unwanted compression in the therapist's hands and it provides more comfort to the therapist as far as smooth application is concerned [11,14].

The entire local inflammatory response to injuries and chronic effect of unhealed injuries to the muscles and surrounding soft tissues will be corrected nicely with the application of IASTM [10,11,13, 15-16].

This single case study is designed to learn the combined effect of IASTM and Myofascial release in low back pain patients. This study result may be used for Chronic Low Back Pain patients to treat them effectively.

2. LITERATURE SURVEY :

A study was published in 2015 on use of Soft Tissue Mobilization Assisted with Instrument (IASTM) with other basic conservative physiotherapy interventions always produces better results in increasing muscle flexibility and alleviation pain. Cost and treatment training was also a limiting factor to use IASTM widely and also IASTM is not one and all treatment for any painful condition and for muscle stiffness [15].

A previous research study was done and published in 2013 on Instrument Assisted Soft Tissue Mobilization for the benefit of lower back pain. That study results concluded that IASTM was more than useful to alleviate pain in lower back subjects. Even though IASTM instrument was very effective

in the treatment of back ache, further research exploration was needed to prove its physiological changes and contribution [17].

Various studies were published to understand the technique of releasing myofascia (MFR) has been an important physiotherapy technique in the treatment of painful conditions and it brought effective output in terms of muscle stiffness. It has been taught in wide range and carried out by physiotherapists throughout the world. It was very useful in the treatment of Low Backache [5].

A research work was done on Ergon® IASTM treatment for low back pain stated that there was improvement in flexible range of hamstring muscle after 4 sessions of interventions, single session per week for 4 weeks. The elastic property of hamstring muscle was improved significantly by recuing the tone of the knee flexors through neurophysiological changes. Anyway additional research information is warranted to extend creative outlooks which will be more beneficial to treat low back ache problems [17].

In a previous study on Ergon® IASTM treatment technique, authors stated that pain related lumbar disc problem has been treated very effectively by Instrument Assisted Soft Tissue Mobilization of lower back muscles. IASTM treatment techniques were very much useful in treating the fascia of lower back muscles which brought effective functioning of the affected musculature where results were significant to improve the flexibility of lower back region and reducing pain with 6 sessions of IASTM interventions, 3 sessions a week for 2 weeks [18].

3. RESEARCH GAP :

Though there are various research publications available to explain the individual effect for the intervention of Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument (IASTM), there is scarcity of studies and publications for the combined effect Myofascial Release (MFR) and Instrument Assisted Soft Tissue Mobilization (IASTM) in the physiotherapy treatment for chronic low back pain.

4. RESEARCH AGENDA :

The main research agenda for this case study is to learn and analyse the effect of combined application of Myofascial Release (MFR) and Instrument Assisted Soft Tissue Mobilization (IASTM) on pain and both side straight leg raise range of motion in chronic low back pain patient.

5. OBJECTIVES OF THIS STUDY :

The main objectives of this single case study are drafted here:

(1) To analyse and understand the effect of Myofascial Release (MFR) and Instrument Assisted Soft Tissue Mobilization (IASTM) in the treatment of chronic low back pain.
(2) To compare and analyse values of pain in VAS and both side Straight Leg Raise Range of Motion with combined intervention of MFR and IASTM in Chronic Low Back Pain Patient.

6. METHODOLOGY :

Mr. M. David Vinoth Kumar, 28 year old male, IT employee from Samayanallur, Madurai District has been a known case of Low Back Ache with L4-L5 posterior protrusion of intervertebral disc and without any known systemic illness since 6 months was recruited for this study. He has been referred to Abhinav Physiotherapy and Fitness Centre, P&T Nagar, Madurai for physiotherapy treatment. Subject demographic data was taken include height, weight and BMI (Body Mass Index). Pre-intervention value of pain in VAS and SLR ROM for both legs has been measured and documented. He has been treated with Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument on the extensor muscles of lower back. Dosage of treatment was as follows,10 repetitions of manual Myofascial Release [5] and 10-15 repetitions of Instrument Assisted Soft Tissue Mobilizations [19] for 30-40 minutes, 1 session per day, 5 sessions per week for 3 weeks were given to him. (Refer table 1). After intervention MFR and IASTM application, subject's post intervention value of Pain in VAS and SLR Range of Motion was recorded and reported for analysis.

Table 1: Intervention Protocol

Week of Intervention	Myofascial Release (MFR) Repetitions	IASTM Repetitions	Total Intervention Time (in minutes)
1st week	10	10	30 min

2nd week	10	10	30 min
3rd week	12	12	30 min
4th week	12	12	40 min
5th week	15	15	40 min

Note. Treatment interventions of MFR and IASTM [5,19] (Source: Author)

Picture 1: Technique of Myofascial Release for Lower Back Extensor Muscles (MFR) (Source Author)

Picture 2: Technique of Instrument Assisted Soft Tissue Mobilization (IASTM) (Source Author)

Outcome Measures:
Pain in Visual Analogue Scale
SLR – Straight Leg Raise Range of Motion (ROM)

7. ANALYSIS AND DISCUSSION :

Descriptive analysis was done with pre and post intervention. Recorded results were that pre intervention value of Pain in VAS Scale was 9, after intervention of Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument (IASTM) was reduced to 2. Pre intervention Straight Leg Raise Range of motion was 65 degrees in right leg and 60 degrees in left leg. After intervention it was increased to 85 degrees on right side and 80 degrees on left side respectively.

Table 2: Demographic Profile

Age	28 Years
Sex	Male
Height in cm	176 cm
Weight in Kgs	70 Kgs
BMI	22.6

Vitals	
HR	82
RR	17
SBP	125 mmhg
DBP	80 mmhg

Note: Demographic data of patient (Source Author)

Table 3: Outcome Measures

Outcome Measures	Pre Intervention	Post Intervention
Pain in VAS	9	2
SLR Rt Side in degrees	65	60
SLR in Left Side in degrees	85	80

Note: Pre and Post Intervention Values of Pain in VAS and both side SLR ROM in degrees (Source Author)

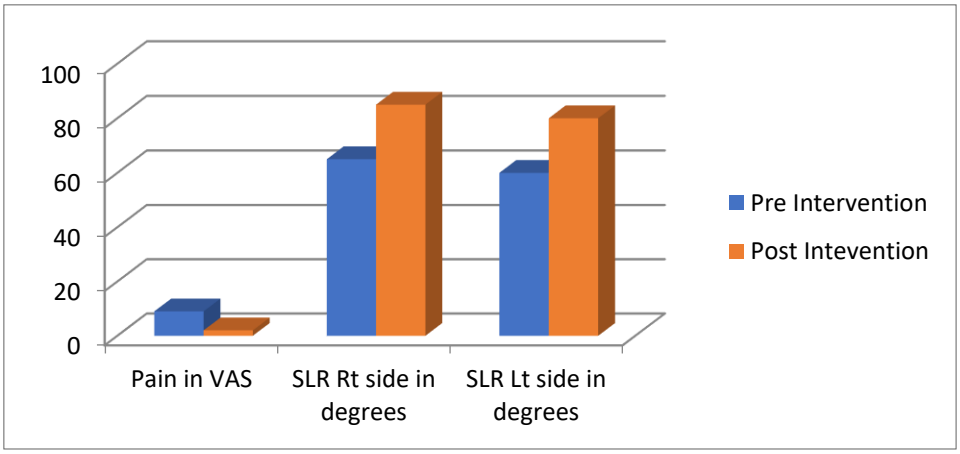

Fig. 1: Pre and Post Intervention Values of Pain in VAS and SLR Rt and Lt side in degrees
Note: Pre and Post Intervention Values of Pain in VAS and both side SLR ROM in degrees (Source Author)

This study results shows that IASTM along with myofascial release reduces pain in low back. Combined intervention of Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument (IASTM) had better effect than it individually. That is the scope of this study. This study results reflected previous study results in which it was concluded that individual application of IASTM was better in the treatment of low back pain but at the same time to establish improved performance advanced research was needed with combination of IASTM with MFR for low back muscles [19].
Myofascial release along IASTM will have better results in reducing pain in low back pain. This study endorses the view of various research scholars who already proved this effect in low back pain subjects in their respective research. [17-19].
A previous study published in 2021 on which beneficial effects of MFR to treat chronic low back pain. The meta-analysis results concluded that MFReffectively reduced pain, and improved functional activity levels in patients with chronic low back pain. That study resulted demanded that more combination of interventions and advanced research designs to improvise physiotherapy treatment intervention to further progression in the management of chronic lower backache [20].

8. CONCLUSION :

This study outcome concluded that there is a reduction in pain and increment in straight leg raise range of motion in both legs while treating chronic low back pain when physiotherapy interventions were given with combination of Myofascial Release (MFR) and Soft Tissue Mobilization Assisted with Instrument (IASTM).
Conflict of Interest: None of the authors have a conflict of interest.

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REFERENCES :

[1] Frymoyer, J. W., Ducker, T. B., Hadler, N. M., & Kostuik, J. P. (1997). *The adult spine: principles and practice*. Philadelphia. (pp 45-60). Lippincott-Raven Publishers. USA. Google Scholar↗

[2] Epping-Jordan, J. E., Wahlgren, D. R., Williams, R. A., Pruitt, S. D., Slater, M. A., Patterson, T. L., ... & Atkinson, J. H. (1998). Transition to chronic pain in men with low back pain: predictive relationships among pain intensity, disability, and depressive symptoms. *Health Psychology*, *17*(5), 421 - 427. Google Scholar↗

[3] Praemer, A., Furner, S., Rice, D. P., & Kelsey, J. L. (1999). Musculoskeletal conditions in the United States. (pp 67-82). Data Harbor. Chicago. USA. Google Scholar↗

[4] Moseley, L. (2002). Combined physiotherapy and education is efficacious for chronic low back pain. *Australian journal of physiotherapy*, *48*(4), 297-302. Google Scholar↗

[5] Barnes, M. F. (1997). The basic science of myofascial release: morphologic change in connective tissue. *Journal of bodywork and movement therapies*, *1*(4), 231-238. Google Scholar↗

[6] Sevier, T. L., & Wilson, J. K. (1999). Treating lateral epicondylitis. *Sports Medicine*, *28*(5), 375-380. Google Scholar↗

[7] Fowler, S., Wilson, J. K., & Sevier, T. L. (2000). Innovative approach for the treatment of cumulative trauma disorders. *Work*, *15*(1), 9-14. Google Scholar↗

[8] Hammer, W. I., & Pfefer, M. T. (2005). Treatment of a case of subacute lumbar compartment syndrome using the Graston technique. *Journal of manipulative and physiological therapeutics*, *28*(3), 199-204. Google Scholar↗

[9] Sevier, T. L., Gehlsen, G. M., Wilson, J. K., Stover, S. A., & Helfst, R. H. (1995). Traditional physical therapy vs. graston augmented soft tissue mobilization in treatment of lateral epicondylitis.: *Medicine & Science in Sports & Exercise*, *27*(5), S52 - S58. Google Scholar↗

[10] Melham, T. J., Sevier, T. L., Malnofski, M. J., Wilson, J. K., & Helfst Jr, R. H. (1998). Chronic ankle pain and fibrosis successfully treated with a new noninvasive augmented soft tissue mobilization technique (ASTM): a case report. *Medicine and science in sports and exercise*, *30*(6), 801-804. Google Scholar↗

[11] Burke, J., Buchberger, D. J., Carey-Loghmani, M. T., Dougherty, P. E., Greco, D. S., & Dishman, J. D. (2007). A pilot study comparing two manual therapy interventions for carpal tunnel syndrome. *Journal of manipulative and physiological therapeutics*, *30*(1), 50-61. Google Scholar↗

[12] Blanchette, M. A., & Normand, M. C. (2011). Augmented soft tissue mobilization vs natural history in the treatment of lateral epicondylitis: a pilot study. *Journal of manipulative and physiological therapeutics*, *34*(2), 123-130. Google Scholar↗

[13] Hammer, W. I., & Pfefer, M. T. (2005). Treatment of a case of subacute lumbar compartment syndrome using the Graston technique. *Journal of manipulative and physiological therapeutics*, *28*(3), 199-204. Google Scholar↗

[14] Hammer, W. I. (2008). The effect of mechanical load on degenerated soft tissue. *Journal of Bodywork and Movement Therapies*, *12*(3), 246-256. Google Scholar↗

[15] Stow, R. (2011). Instrument-assisted soft tissue mobilization. *International journal of athletic therapy and training*, *16*(3), 5-8. Google Scholar↗

[16] Davidson, C. J., Ganion, L. R., Gehlsen, G. M., Verhoestra, B. E. T. H., Roepke, J. E., & Sevier, T. L. (1997). Rat tendon morphologic and functional changes resulting from soft tissue mobilization. *Medicine and science in sports and exercise*, *29*(3), 313-319. Google Scholar↗

[17] Fousekis, K., Eid, K., Tafa, E., Gkrilias, P., Mylonas, K., Angelopoulos, P., ... & Tsepis, E. (2019). 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? A randomized control study. *Journal of physical therapy science*, *31*(7), 508-511. Google Scholar↗

[18] Zlatkov, Y., & Zlatkova, K. (2021). Monitoring the effect of the ERGON IASTM technique in patients with lumbar disc herniation. *Journal of Physical Education and Sport*, *21*(5), 2706-2711.Google Scholar↗

[19] Baker, R. T., Nasypany, A., Seegmiller, J. G., & Baker, J. G. (2013). Instrument-assisted soft tissue mobilization treatment for tissue extensibility dysfunction. *International Journal of Athletic Therapy and Training*, *18*(5), 16-21. Google Scholar↗

[20] Wu, Z., Wang, Y., Ye, X., Chen, Z., Zhou, R., Ye, Z., & Xu, X. (2021). Myofascial release for chronic low back pain: A systematic review and meta-analysis. *Frontiers in medicine*, *8 (1)*, 697986; 1-14. Google Scholar↗

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