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Comparison of Myofascial Release Technique and Deep Transverse Friction Massage on Pain, Range of Motion and Functional Ability in Subjects with Chronic Bicipital Tendonitis: An Comparative Study

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ABSTRACT

The objectives of this randomized controlled trial was to evaluate the comparison of the effectiveness of myofascial release technique and deep transverse friction massage in subjects with chronic bicipital tendonitis.This case-control study evaluated 23 participants aged 18 to 60 years recruited for the study on the basis of the inclusion and exclusion criteria after signing the informed consent form. The subjects were divided into two Groups MFR (Group A) & DTFM (Group B). Pain was used to measure NPS, ROM of shoulder joint was used to measure by goniometer and functional ability was used to measure DASH questionnaire. The result of the present study indicates that the within group analysis for NPS, ROM and DASH both the groups showed significant difference. Between group analysis for NPS, ROM and DASH showed no statistically difference. The present study concluded that both the techniques i.e, MFR and DTFM are equally effective in reducing pain, improving ROM and functional ability with chronic bicipital tendonitis.

Key Words: *NPS, Goniometry, DASH*

INTRODUCTION

Bicipital tendonitis is the inflammation of the tendon around the long head of the biceps muscle. Acute bicipital tendonitis may occur because of sudden overuse. Previous studies have listed the following biomechanical causes for bicipital tendonitis: coracoacromial ligament thickening, impingement beneath the coracoacromial arch by a bone spur, and acromial apophysis unfusion. In the end stage of chronic inflammation, scarring and adhesion of the biceps tendon in the bicipital groove can occur. According to Chen et al., yergason's tests had a sensitivity of 32% and specificity of 78%, whereas speed's tests had a sensitivity of 63% and specificity of 58%.[1] The most common physical examination finding is tenderness to palpation over the bicipital groove. The inflammation process can initially lead to biceps tendon hyperemia and subsequent swelling of the tendon sheath because of interstitial tissue osmolarity that is changed by the release of chemokine.[1]

MFR technique is a facilitation of mechanical, neural and psycho-physiological adaptive potential as interfaced via the myofascial system.[2] This include**,** Increased circulation to the area of restriction delivers oxygenated blood and nutrients to the tissue and remove harmful metabolic waste product, increased venous and lymphatic drainage decreases local swelling and edema caused by tissue inflammation, elasticity and flexibility of connective tissue elongates connective tissues secondary to mechanical loading and increased temperature causes an increase in elasticity and stretch of muscle.[3]

DTFM is a specific type of connective tissue massage applied precisely to the soft tissue structures such as tendons. It is vital that DTFM be performed only at the exact site of the lesion, with the depth of friction tolerable to the patient. The effect is so localized that, unless the finger is applied to the exact site and friction given in the right direction, relief cannot be expected. DTFM must be applied transversely to the specific tissue involved.[4]

Both MFR and DTFM have separately been found to be effective on reducing pain and ROM evoked by tendonitis. Thus we set out to examine which amongst these techniques is most effective in treating chronic bicipital tendonitis. Previously MFR and DTFM have been compared, in subject with trigger point, but we have not come across any literature regarding subjects with tendonitis. We also did not come across any literature which observed effect of these two techniques on ROM and functional ability in subject with chronic bicipital tendonitis. Hence, these study was designed the bridge these gaps. The purpose of the study is to evaluate the significant changes, if any in pain, ROM and functional ability, after the intervention of MFR and DTFM and compare the effect of both in subject with chronic bicipital tendonitis. There may be a significant difference in pain, ROM and functional ability between subjects who are administered MFR and DTFM.

MATERIAL AND METHODS

A total number of 23 male and female subjects, with an age of 18-60years, were recruited from various hospitals and clinics in odisha according to the inclusion and exclusion criteria. All relevant ethical safeguards were met in relation to patient or subject protection in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, revised 2002. Methods, purpose and risks associated with the study were explained to the subjects and written consent taken and pre-intervention data were collected from the patients. No other treatment or drugs were used during the study period. The study was approved by the institutional research ethics committee. Instrumentation were used that stop watch, ultrasound unit, universal goniometer. Inclusion criteria were if they had diagnosed cases of chronic bicipital tendonitis, age between 18 – 60 yrs, both genders, pain at resisted elbow flexion, supination and external rotation of shoulder. Exclusion criteria were if they had swelling over the bicep tendon, history of last 6month of any anticoagulant therapy, history of Diabetics, history of any other associated illness like metabolic, metastatic and infective disorder, any surgical history in last 6 months on shoulder and elbow, history of degenerative changes and fracture of shoulder and elbow, history of any radiating pain around the shoulder and elbow, any Musculoskeletal Injury which limits the application of MFR and DTFM, previous Physiotherapy treatment in past 1 months around Shoulder, corticosteroid injection in the preceding 3months.

At the time of inclusion all the subjects were evaluated pre- intervention data for pain was measured by numeric pain scale, ROM was measured by goniometer and functional ability was measured by DASH questionnaire. Then first group (A) MFR with Ultra Sound, and second group (B) DTFM with Ultra Sound. After 2 week intervention all the subjects were again evaluated for pain, ROM and functional ability. Group A protocol were administered MFR for 10 repetation for 1mints hold, and 30secs rest in between followed by ultrasound with $1MH_{Z,}$ 0.5w/cm, continuous, 5mints over the patient's affected part.[2] The subject assumed a supine position in such a way that the shoulder of the subject is comfortably supported or rested on the table so that any pressure of MFR does not cause any discomfort with therapist standing on the side of the table at the level of the subjects shoulder and facing the affected hand. The therapist gave focused stretch over the bicep brachii muscle using the thumb of one hand towards the bicipital groove and the thumb of the other hand put a line of tension in distal direction towards the middle of the muscle belly. This was carried for just a few centimeters with a firm pressure (1mints). Hold, wait for the release and stretch again. Group B protocol were administered DTFM for 2mins light friction and then 8mints harder friction followed by ultrasound with $1MH_{Z,}$ 0.5w/cm, continuous, 5mints over the subjects affected part.[5] The

subject assumed a supine position in such a way that the shoulder of the subject is comfortably supported or rested on the table so that any pressure of DTFM does not cause any discomfort with therapist standing on the side of the table at the level of the subjects shoulder and facing the affected hand. The thumb was applied over the bicipital groove. The skin was dry and cream was not used. It is extremely important during friction. DTFM was applied transversely to the therapist's fingers and patient's skin was moved as a single unit tendon. The principle element of friction was to go across the tissue with as much pressure as the patient can tolerate. Both the interventions were provided 2weeks, 6days/weeks. and duration of each treatment session was 15-20 mints.

DATA ANALYSIS

The data was analyzed by using SPSS version-16. Paired t-test, one way independent sample was used for analysis of data. Paired t-test was applied to compare the data within the groups. Independent sample test was used to compare the data between the groups. The statistical significance was set at 0.05 at 95% confidence and p value <0.05 was considered significant.

RESULT

The mean and standard deviation of age, height and weight values were shown in Table- 1 in different groups respectively. The mean and standard deviation of age, height and weight values were calculated for subjects were as follows:

Within group analysis for NPS both the groups showed significant difference in fig-3 [Group A (p=0.000), Group B (p=0.000)]. Within group analysis for ROM both the groups showed significant difference in fig-4 [Group A- Flex (p=0.001) and Ext , Abd, MR and LR (p=0.000) AND Group B - Flx, Ext, MR and LR in fig-5 (p=0.000) and Abd (p=0.002)]. Within group analysis for DASH both the groups showed significant difference in fig-6 [Group A (p=0.000), Group B (p=0.000)]. Between group analysis for NPS showed no statistically difference in fig-7 [pre (p=0.492) and post (p=0.381)]. Between group analysis for ROM showed no statistically difference in fig-8 and fig-9. Between group analysis for DASH showed no statistically difference in fig-10 [pre (p=0.387) and post (p=0.265)]. When comparison was done between the groups, we did not come across any significant difference for any of the parameters.

Table.1 Demographic Data

	MEAN		SD	
	GROUP A	GROUP B	GROUP A	GROUP B
AGE (yrs)	39.833	39.364	12.141	10.538
HEIGHT (cm)	159.67	159.64	5.836	4.696
WEIGHT (kg)	59.417	60.091	5.946	5.855

Fig. 1 Myofacial Release Technique

Fig.2 Deep Transverse Friction Massage Technique

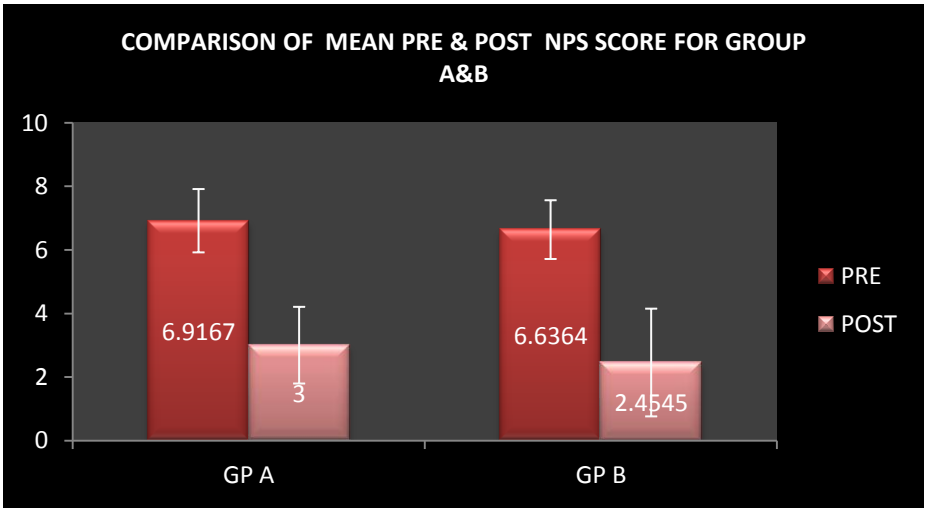

Fig. 3 Comparison of mean pre & post NPS for group A & B

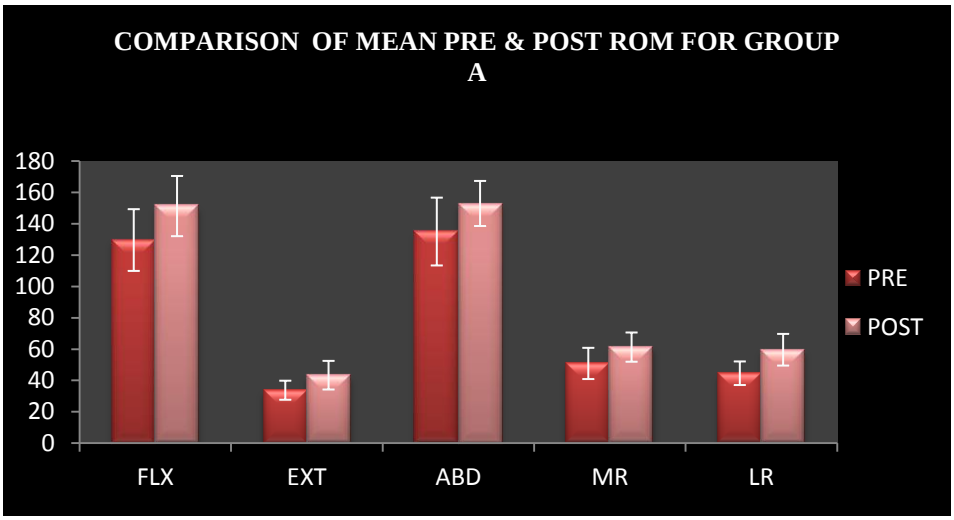

Fig. 4 Comparison of mean pre & post ROM for group A

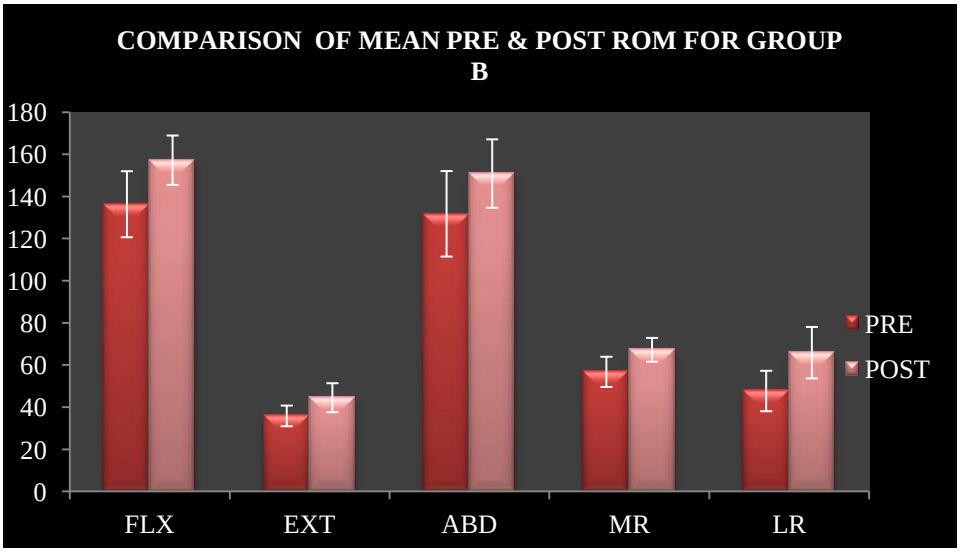

Fig.5 Comparison of mean pre & post ROM for group B

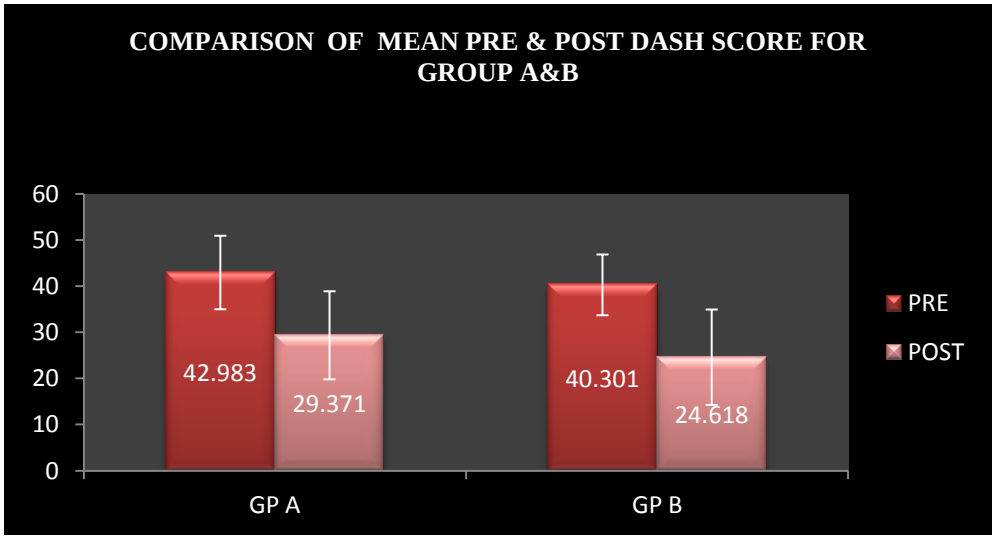

Fig .6 Comparison of mean pre & post DASH score for group A & B

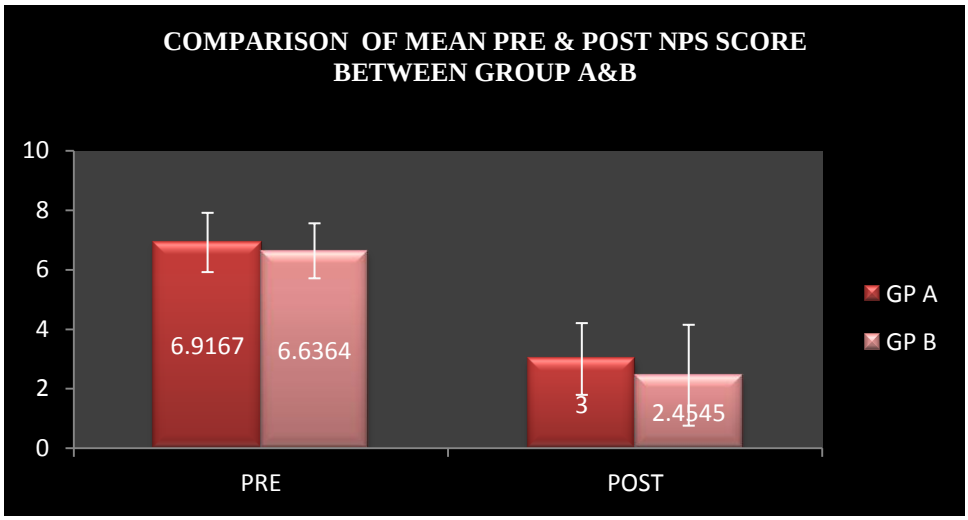

Fig. 7 Comparison of mean pre & post NPS score between group A & B

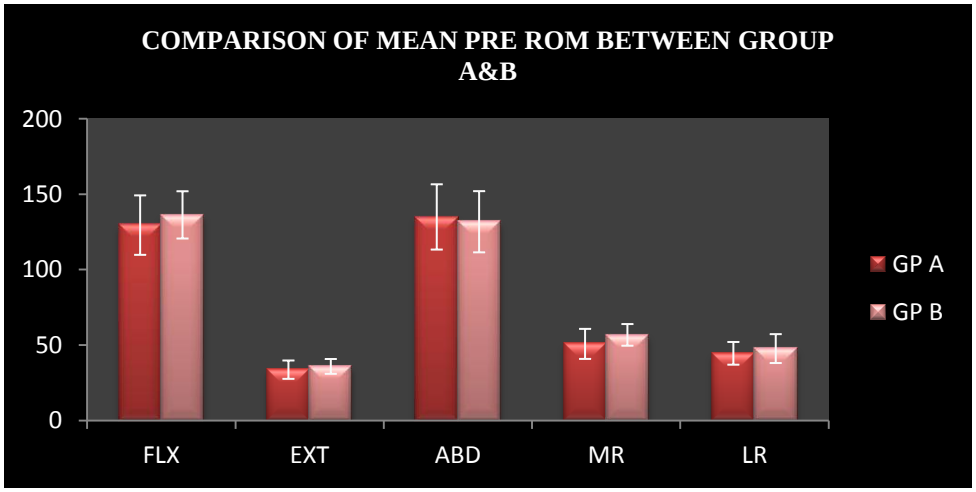

Fig .8 Comparison Of Mean Pre ROM Between Group A & B

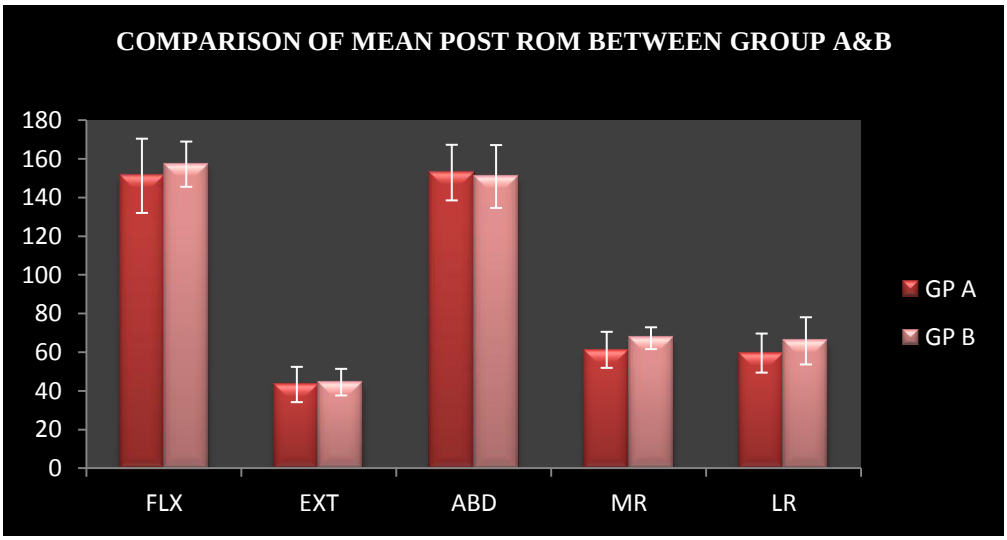

Fig.9 Comparison of mean post ROM between group A & B

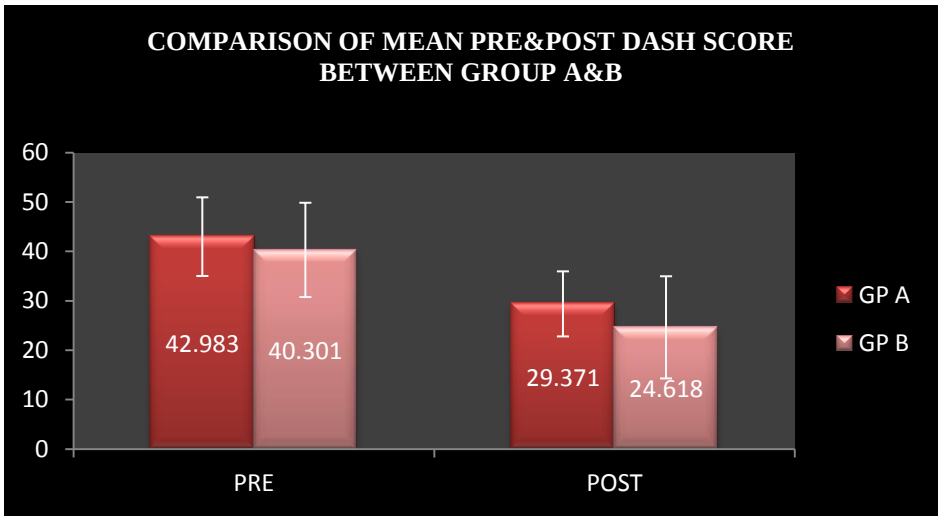

Fig.10 Comparison of mean pre & post DASH score between group A & B

DISCUSSION

The present study was carried out to compare MFR Technique and DTFM with a common treatment of ultrasound on pain, range of motion and functional ability in subjects with chronic bicipital tendonitis. Pain, ROM and functional ability were measured 2 times: pre and post intervention through NPS, Goniometric measurement and DASH respectively. In this study it was found that bicipital tendonitis was reported to be more common in people whose job requires repetitive overhead motion and repetitive shoulder movement.

The present study suggest that MFR and DTFM respectively with a common treatment of ultrasound reduce pain, ROM and improve functional ability when tested pre and post treatment ($p < 0.000$) significantly.

MFR techniques are helpful in alleviate musculoskeletal pain. Many theories have been suggested including the Gate Control Theory, interpersonal attention, parasympathetic response of the autonomic nervous system, and the release of serotonin. The Gate Control theory suggests that sensory stimuli, such as pressure, travel along faster nervous system pathways than do pain stimuli. The faster moving pressure stimuli interfere with the transmission of painful stimuli to the brain, thus "closing the gate" to the brain's perception of pain. Interpersonal attention refers to the hands-on, individualized attention that the recipient of massage receives. This personal attention and human touch often has a calming effect that decreases the perception of pain. This relates to the parasympathetic response of the autonomic nervous system. The stimulation of a parasympathetic response decreases the release of stress hormones, anxiety, depression, and pain. The release of serotonin blocks the transmission of noxious stimuli to the brain. Other inhibitory neurotransmitters, such as endorphins, may be released by the pressure that is generated by the treatment. MFR's ability to alleviate pain may relieve muscle spasm, which can be attributed to the application of direct pressure as well.[6] MFR helped in breaking adhesions, increasing blood

flow and lymphatic drainage helped to increase soft tissue extensibility which improved range of motion and thus muscle strength.[7] The result of the present study supports this mechanism.

Similarly, a number of hypothesis to explain the pain relieving effect of DTFM have been put forward. Pain relief during and after friction massage may be result of modulation of the nociceptive impules at spinal cord level, i.e gate control theory.

DTFM cause the stimulation of nociceptive endings connected to Aδ fibres and mechanoreceptors found in soft tissues which are connected to large diameter Aβ fibres. These large diameter fibres have an effect on cells in the posterior horn of the cord tending to inhibit forward transmission of the small-diameter nociceptive information, i.e. the pain gate is closed. Hence it is suggested that presynaptic inhibition at cord level will modulate peripheral pain and reduce its perception. There may also be inhibition of neurotransmission exerted from higher centers, as the arrival of nociceptive stimuli at certain central inhibitory nuclei in the CNS (Raphe nuclei and periaqueductal area of grey matter in the midbrain) causes release of chemicals from neurons at cord level which block the action of nociceptive neurotransmitters. Consequently, in terms of modulation of pain, transverse frictions can be justified on both counts as they will cause presynaptic inhibition at the cord level and inhibit pain by the central production of encephalins. Massage increases the blood circulation in the soft tissue, thus enhances the excretion of lactate or inflammatory substances and facilitates secretion of endogenous opiates. DTFM not only results in the resets of sarcomere lengthening but it also helps in the proliferation of the fibroblast which thereby not only improves the soft tissue healing but also realign the muscle fibers by offering the effective stretching and mobilization to the taut bands.[8]

We did found the improvement of pain, ROM and functional ability in both the groups. When comparison was done between the groups we did not come across any significant difference for any of the parameters, although better result was seen in group- B. The overall mechanism of action appears to be more or less similar, although the present study evaluated ROM and Function, which will add to the available literature regarding MFR and DTFM.

Limitation of the present study was small sample size, ergonomical advices, subjects could not be followed up for longer period of time to see long term benefit and occupation relevance was not compared. For future studies propose that large sample size can be taken and studies with longer duration are recommended with longer follow-up period to assess long term benefits.

CONCLUSION

The present study concluded that both the techniques i.e. MFR Technique and DTFM are equally effective in reducing pain, improving ROM and functional ability in subjects with chronic bicipital tendonitis.

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REFERENCE

1. Shih WH et.al. Quantitative Diagnostic Method For Biceps Long Head tendinitis By Using Ultrasound. *The Scientific world Journal*. 2013 November. 1-7
2. Patra P et.al. Effect Of 3-D Torque and Muscle Splay Techniques On Subjects With Posterior Tibial Tendon Dysfunction: A Comparative Study. *International Journal Of Pharmaceutical And Biological Research*. 2013 Aug-Sep(4) 4. 117-132
3. Apeksha O. Yadav et.al. Comparison Of The Effects Of Therapeutic Ultrasound V/S Myofascial Release Technique In Treatment Of Plantar Fasciitis. *Indian Journal Of Physiotherapy & Occupational Therapy*. 2012 April-June(6) 2. 17-21
4. Stasinopoulos D et.al. Cyriax Physiotherapy for Tennis Elbow/ Lateral Epicondylitis. *Br J Sports Med.* 2004 May 11 (38). 675-677
5. Schwellnus MP et.al. Deep Transverse Friction In The Treatment Of Iliotibial Band Friction Syndrome In Athletes: A Clinical Trial. Physiotherapy.1992 August.78 (6) 564 – 568.
6. www.logan.edu/mm/files/LRC/Senior-Research. John Werenski. The Effectiveness of Myofascial Release Techniques in the Treatment of Myofascial Pain: A Literature Review. Logan University.2011 June 17.
7. Saratchandran R et.al. Myofascial Release As An Adjunct To Conventional Occupational Therapy In Mechanical Low Back Pain. *The Indian Journal Of Occupational Therapy*. 2013August. (45) 2 3-7.
8. Doley M et.al. Effect Of Positional Release Therapy And Deep Transverse Friction Massage On Gluteus Medius Trigger Point - A Comparative Study. Journal Of Exercise Science And Physiotherapy. 2013. (9)1.40-4