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"A Comparative Study of Instrument Assisted Soft Tissue Mobilization Vs Decompression Therapy in the Treatment of Myofascial Trigger Points in Calf Muscle of Security Guard"

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Abstract

Purpose of this study was to investigate and to find the effects of decompression therapy and IASTM tool on release of trigger points on security guards.

The use of IASTM in releasing trigger points is well known but research is not available, and comparison between decompression therapy vs IASTM is not well explored.

Method: In this study 30 security guards were screened in according to inclusion and exclusion criteria and were divided into two groups of 15 sample each group respectively.

Group A was treated with IASTM and Group B with decompression therapy. Outcome measures were taken pre and post treatment that's is on first session and the last session

Result: the data was presented using descriptive analysis (mean, median, standard deviation). The amount of change noted in all the outcome measures was evaluated by the paired T-test, Unpaired T test, Mann Whitney rank sum test, Wilcoxon test.

The analysis shows the above study was effective in treating trigger points both with decompression therapy and IASTM. But IASTM proved to be more effective.

Conclusion: it can be concluded that from the above study both decompression and IASTM proved to be effective. But it was seen IASTM showed more improvement as compared to Decompression Therapy.

Keywords: Decompression therapy, IASTM, Trigger points.

1. Introduction

Through sliding layers of fascia, the muscle and fascia system assist in force transfer in muscles, proprioception, fibroblastic activity, nociception, and friction in compartment reduces during movement. The myofascial system can be restricted due to injury, poor posture, or a lack of full range of motion.

Joint range of motion reduction is common, and it might indicate musculoskeletal injury. Ankle dorsiflexion insufficiency increases the risk of a variety of lower limb injuries that affect the foot and ankle, as well as the posterior chain completely.

Less than 20 degrees of closed chain dorsiflexion impairs normal gait, which might lead to compensation of gait pattern. Ankle dorsiflexion insufficiency can lead to genu recurvatum, pronation of subtalar joint excessively, metatarsalgia, sprains in ankle, shin splints, Achilles tendon injuries, plantar fascia inflammation, frontal knee pain, gastrocnemius muscle strains, and anterior cruciate ligament injuries in otherwise healthy people. The literature has connected trigger points in myofascial (MTrPs) to decreased joint ROM.

Trigger points release may be an effective intervention for joint Range of motion reduction (Travell and Simons, 1983; 1992; Simons et al, 1999; Lucas et al, 2004; Fernandez de las Penas et al., 2005; Blanco et al., 2006), but there few research available suggesting it (Travell and Simons, 1983; 1992; Simons et al, 1999; Lucas et al, 2004; Fernandez de la

The release of soleus TrPs causes a large rise in ADF ROM right away, according to earlier research. Gastrocnemius muscular stiffness is one of the most common causes of restricted ADF.

A TrP is a highly irritable spot in a band of muscle fibers which are tense. When sufficient amount of stimulation and compression is done within the patient's threshold of pain, it creates referred motor phenomena , limits complete lengthening of muscles, reduces the strength of the muscle, initiates a response of muscle fibers known as local twitching , creates referred motor phenomena and frequently causes symptoms of autonomic system (Travell and Simons, 1983; 1992; Simons et al, 1999

When acetylcholine is released in excess, trigger points production takes place causing muscle fibers to depolarize for an extended period of time. The width of the sarcomere is expanded while the length is diminished. These prolonged muscular sarcomere contractions constrict local blood flow, limiting the region's energy requirements. This energy crisis produces sensitizing chemicals that interact with some nociceptive nerves in the nearby area, causing localized muscle discomfort. Myofascial trigger points in the above situated two-joint muscle gastrocnemius are typically situated along the muscle’s lateral border or medial border.

Pain in the calf and instep of the foot is frequently referred by these TPs.

Walking uphill is uncomfortable with active TPs in this muscle, and nocturnal calf cramps are prevalent. Heel pain and soreness that is wrongly attributed to a heel spur is commonly caused by TPs in the second layer, single joint soleus muscle. TPs in this muscle can occasionally cause discomfort in the same side's sacroiliac joint.

James Cyriax’s argument is the foundation of IASTM. IASTM employs specially designed devices to detect and treat myofascial limitations, as well as mobilize soft tissue to reduce discomfort and enhance range of motion.

IASTM is used to give the physician a mechanical advantage by allowing deeper penetration while simultaneously lowering applied stress on the hands.

Cupping therapy is a soft tissue treatment procedure that has been around since 3000 BC and involves the use of glass, plastic, or bamboo cups [8]. Physical therapists use 'dry cupping,' a non-invasive procedure for modulating pain and movement in patients, also known as ‘static cupping,' in which the cup applies a stress to a soft tissue structure, or 'wet cupping,' in which the cup applies a stress to a soft tissue structure, or 'wet cupping,' in which the cup applies a stress to a soft tissue structure, or 'wet cupping,' in which the cup The suction cups are usually left in situ for 5–40 minutes during static cupping.

Cupping therapy has a local biomechanical effect on tissue, in which a negative pressure generates tension beneath the cup's surface in the center, while the cup's rim compresses the soft tissue beneath it [10]. Tensile forces have been demonstrated to extend down to the muscle layer of tissue in the core of the cup.

The IASTM treatment is hypothesized to promote connective tissue remodeling by removing excess fibrosis and encouraging collagen repair and regeneration through fibroblast recruitment.

Furthermore, large surface area cups apply more tension force to a deeper area than smaller cups. This action is biomechanical and can induce increase in blood flow, edema, and ecchymosis at the treatment site, with the ecchymosis becoming more pronounced the longer the cup stays on the skin. These bruises have been said to fade away.

In terms of cupping pressure, Al-Bedah et al. have classified the intensity of this pressure. Light, medium, or strong are the three categories, with pressures ranging from 100 to below 300 millibar (1–2 pumps done manually), 300 to below 500 millibar (3–4 pumps), and above than 500 millibar (5 or more pumps) .

The more powerful the suction and the longer duration the cups are on the skin, the more skin discoloration observed. Suction cup placement over an acupoint or trigger point is thought to have an analgesic effect on both treatment side and surrounding structure.

Cupping an MTP can stimulate tiny diameter neurons in muscles, which send impulses to higher pain control areas, blocking nociceptive input. Local production of serotonin, endorphins or cortisol for reduction of pain, local changes in blood flow, and response of immune system to local stimulation over an area having pain have all been hypothesized as additional mechanisms. Static cupping will be used in our research.

College ethical committee. Participants fulfilling the inclusion and exclusion criteria will be put randomly in the two groups. Group A : IASTM and Group B : decompression therapy.

Explanation of the technique will be given to the security guards and two sessions per week for 2 weeks will be given. Consent form will be given and filled from the participants. Pre test value will be given accordingly to the groups. Pre test value will be analyzed and data analysis will be done.

2. Intervention

Decompression Therapy

2-5 pumps above the gastrocnemius muscle and static as well as dynamic movement

Instrument Assisted Soft Tissue Manipulation

5-10 seconds hold above the trigger points and then to and fro movement along the length of the muscle

OUTCOME MEASURES: pressure algometry, range of motion, NPRS

3. Results

Graph 1 and Table 1 explains the mean pre - treatment NPRS value for group A participants which was 6.06. The post treatment value of the same was 3.8

It shows a decrease in the NPRS as confirmed by p value at less than 0.0001 which is strongly significant.

Graph 2 and Table 2, explains the mean pre -treatment PRESSURE ALGOMETRY value for group A participants which was 2.42

The post treatment value of the same 2.986

It shows an increase in the PRESSURE ALGOMETRY ranges as confirmed by p value at less than 0.0001 which is strongly significant.

Graph 3 and Table 3, explains the mean pre-treatment Ankle Dorsiflexion Range of motion value for group A participants which was 15.6.

The post treatment value of the same was 18.266

It shows an increase in the ankle dorsiflexion rom ranges as confirmed by p value at less than 0.0001 which is strongly significant.

Graph 4 and Table 4 explains the mean pre- treatment NPRS value for group B participants which was 6.466.

The post treatment value of the same was 4.6

It shows a decrease in the NPRS value as confirmed by p value at less than 0.0001 which is strongly significant

Graph 5 and table 5 explains the mean pre-treatment PRESSURE ALGOMETRY value for group B participants which was 2.486. The post treatment value of the same was 2.873

It shows an increase in the PRESSURE ALGOMETRY ranges as confirmed by p value at less than 0.0001 which is strongly significant.

Graph 6 and table 6 explains the mean pre- treatment Ankle Dorsiflexion value for group B participants which was 14.533.

The post treatment value of the same was 17.86

It shows an increase in the Ankle Dorsiflexion ranges as confirmed by p value at less than 0.0001 which is strongly significant.

Graph7 and table 7 explains the mean difference of pre and post readings of NPRS in both groups.

The mean difference in group A was 3.8 and group B was 4.6

This graph shows group A demonstrated more decrease in NPRS with t-value of 1.789 and p-value of 0.0845

Graph 8 and table 8 explains the mean difference between pre and post readings of Pressure algometer in both groups.

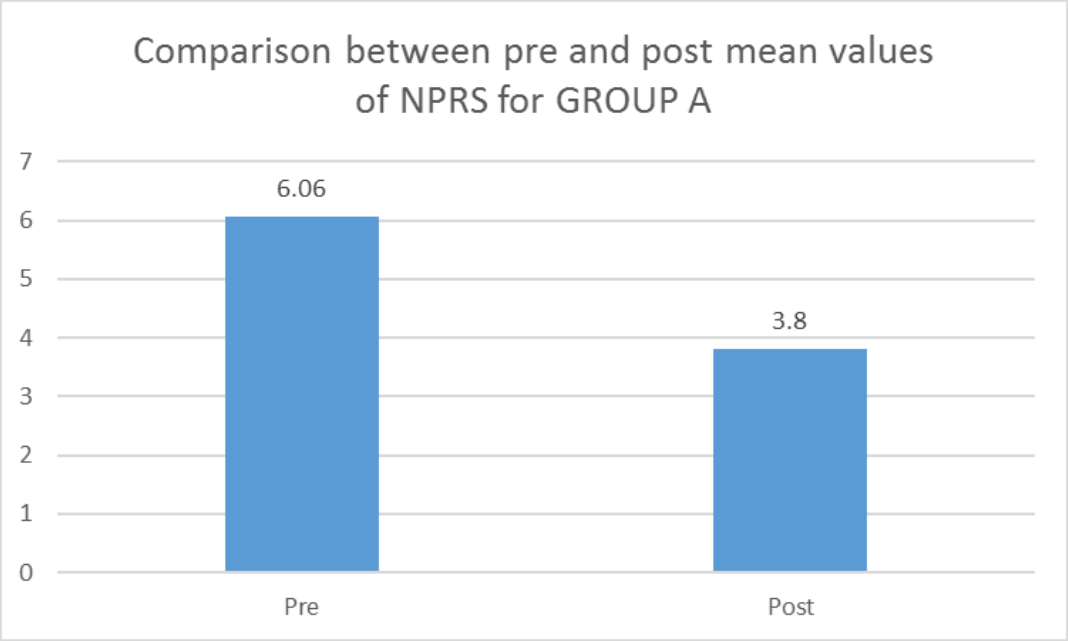
The mean difference in group A was 2.986 and group B was 2.87

This shows group A demonstrated more increase in pressure algometer range as compared to group B with p-value of 0.5165

Graph 9 and Table 9 explains the mean difference between pre and post readings of Ankle dorsiflexion Range of motion in both groups.

The mean difference in group A was 18.226 and group B was 17.8

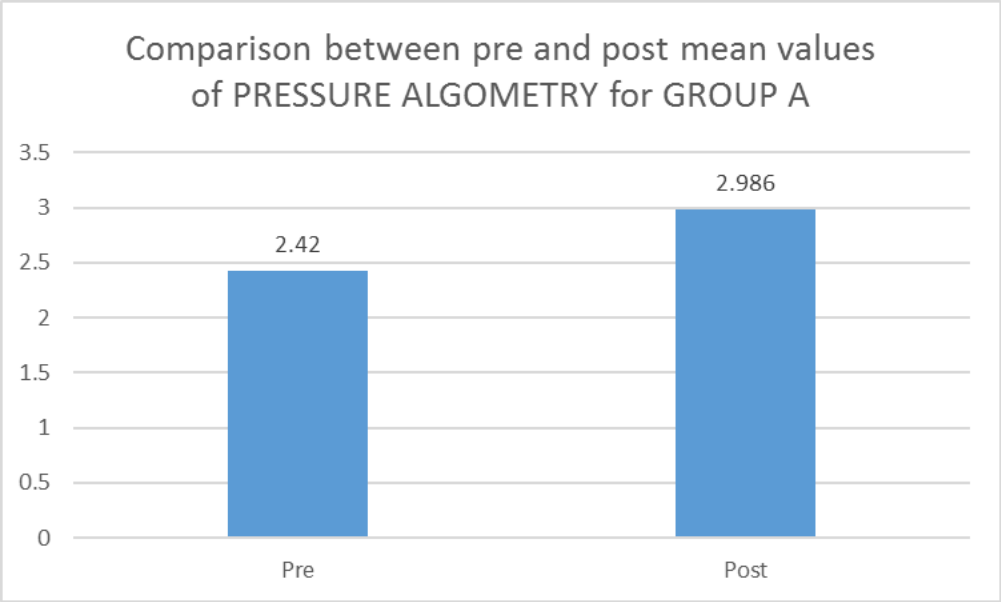
This shows group A demonstrated more increase in ankle dorsiflexion range of motion as compared to group B with p-value of 0.436.



Graph 1

Table No: 1

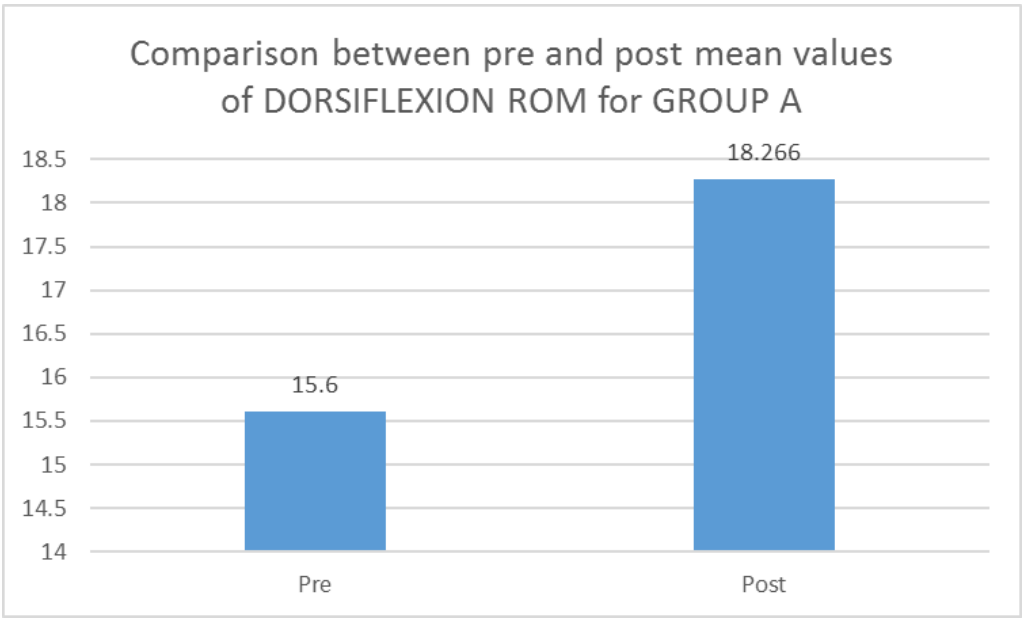
NPRS	MEAN	SD	P-VALUE
PRE	6.06	1.222	< 0.0001
POST	3.8	1.320	



GRAPH 2

Table No: 2

PRESSURE ALGOMETRY	MEAN	SD	P-VALUE
PRE	2.42	0.400	< 0.0001
POST	2.986	0.541	



GRAPH 3

Table No:3

Ankle dorsiflexion rom	MEAN	SD	P-VALUE
PRE	15.6	2.414	< 0.0001
POST	18.266	1.751	

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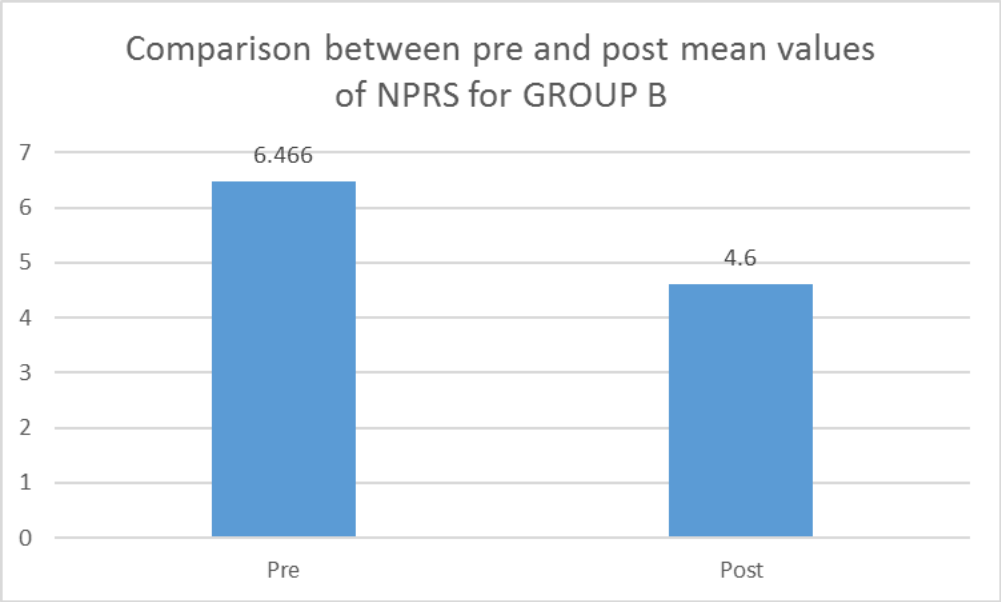
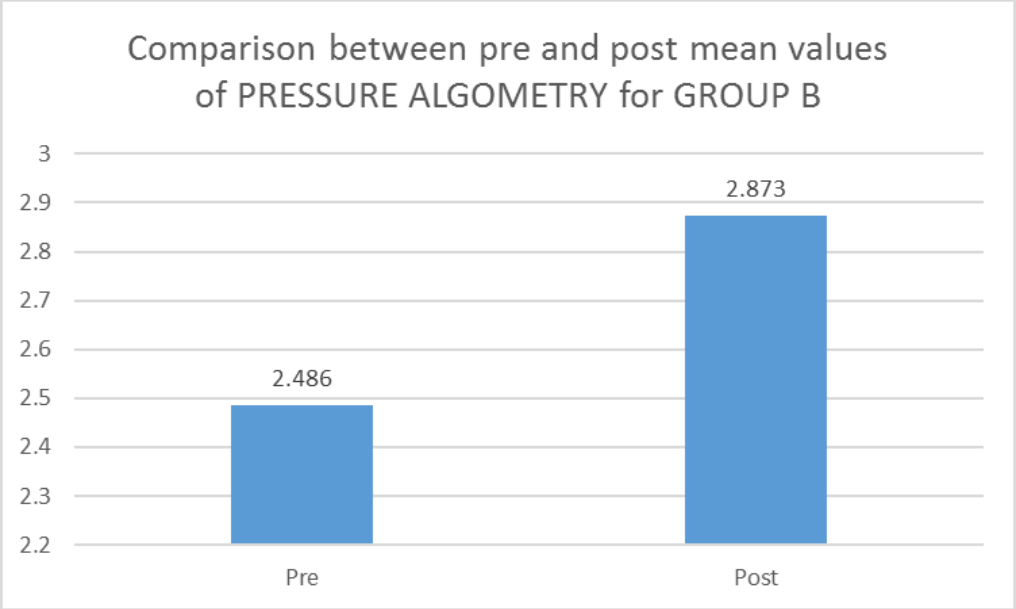


GRAPH 4

Table No: 4

NPRS	MEAN	SD	P-VALUE
PRE	6.466	1.302	< 0.0001
POST	4.6	1.212	



GRAPH 5

Table No:5

PRESSURE ALGOMETRY	MEAN	SD	P-VALUE
PRE	2.486	0.405	< 0.0001
POST	2.873	0.391	

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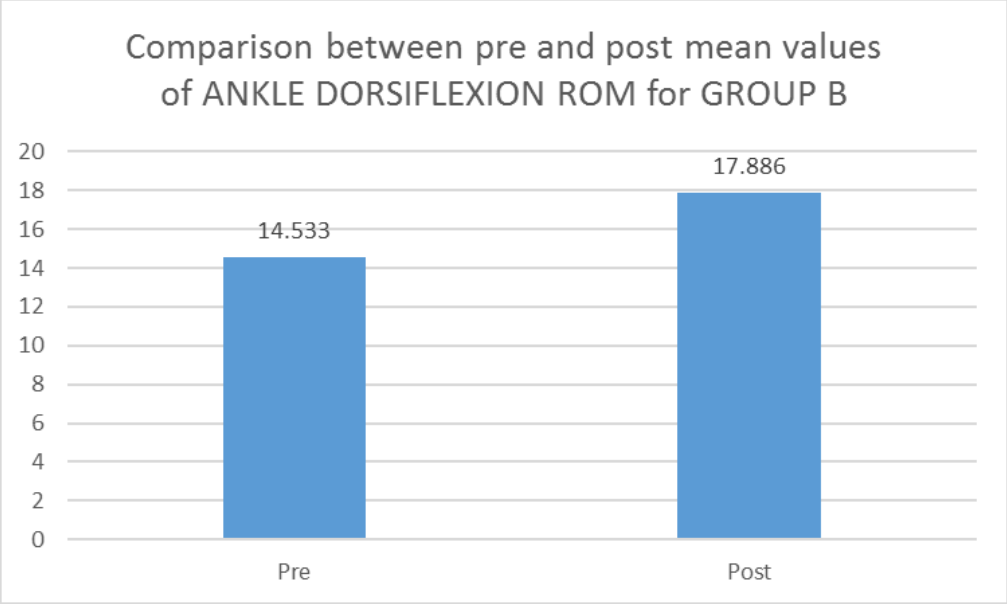
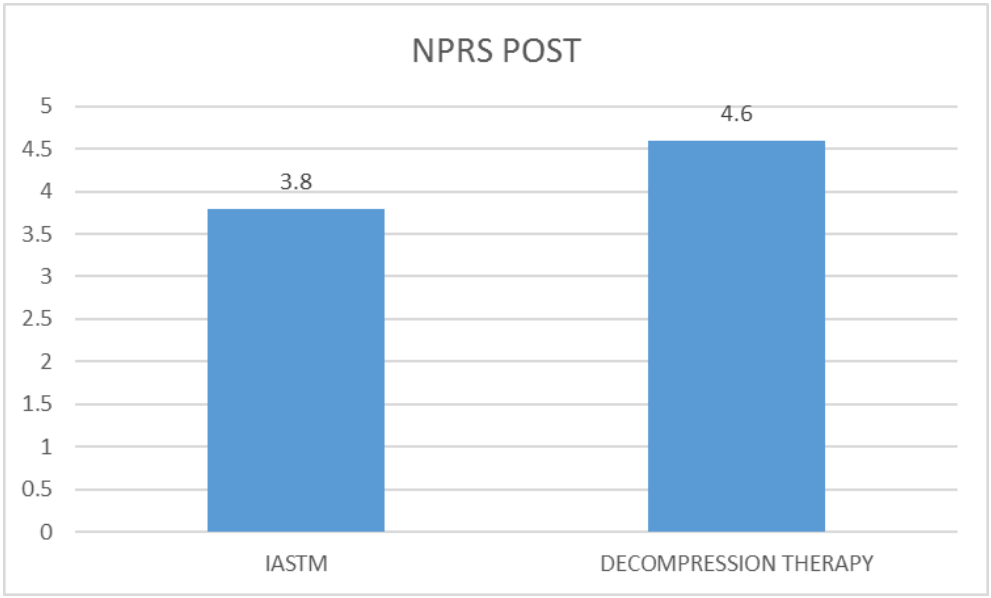


GRAPH 6

Table No:6

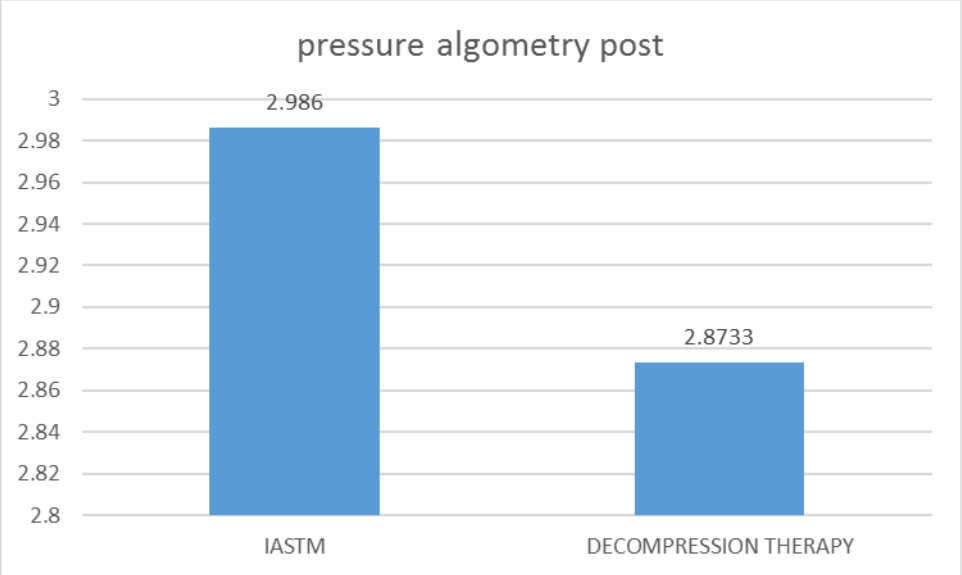
Ankle dorsiflexion rom	MEAN	SD	P-VALUE
PRE	14.533	1.9223	< 0.0001
POST	17.866	1.4226	



GRAPH 7

Table No:7

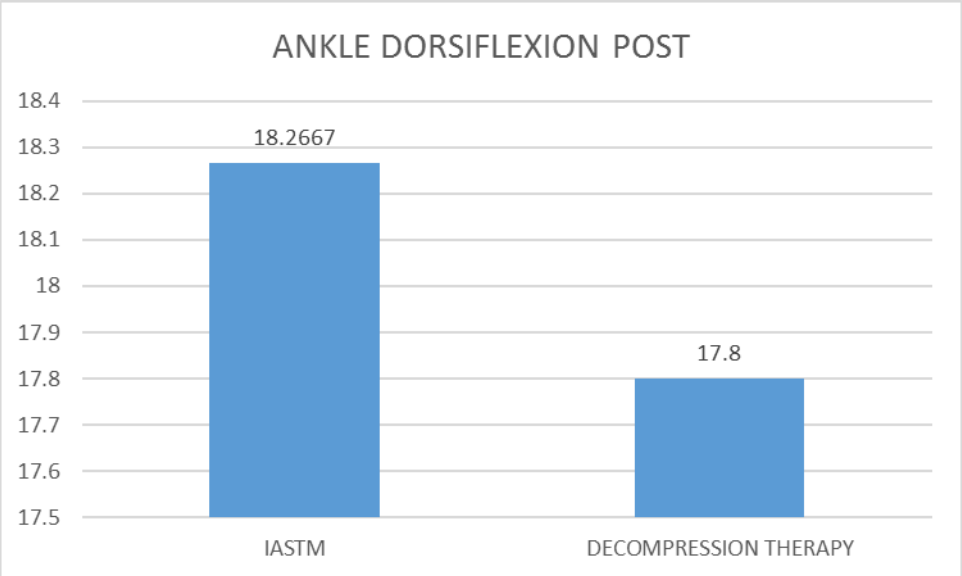
NPRS	MEAN	SD	t-VALUE	P-VALUE
GROUP A(IASTM)	3.8	1.320	1.789	0.0845
GROUP B (DECOMPRESSION THERAPY	4.6	1.121		



GRAPH 8

Table No:8

PRESSURE ALGOMETRY	MEAN	SD	t-VALUE	P-VALUE
GROUP A(IASTM)	2.986	0.5410	-0.657	0.5165
GROUP B (DECOMPRESSION THERAPY	2.8733	0.3918		



GRAPH 9

Table No:9

ANKLE DF ROM	MEAN	SD	t-VALUE	P-VALUE
GROUP A(IASTM)	18.266	1.751	-0.790	0.436
GROUP B (DECOMPRESSION THERAPY	17.8	1.473		

4. Discussion

The goal of this study was to see how IASTM compared to decompression therapy for calf pain. In terms of security guards

In this study, IASTM was found to be more effective than decompression therapy in releasing calf muscle trigger points in security guards.

Maria Adele Giamberarindo et al. claim that Myofascial Pain Syndrome is caused by trigger points. Trigger points are places of exquisite tenderness and hyperirritability in the muscle or fascia that are concentrated in taut, palpable bands and give a local twitch response of muscle fibres under precise examination, according to the article. Among the most important criteria are:

1) Spontaneous localised pain

2) A taut, perceptible ring in a muscle that is easily accessible

3) Limitation in range of motion

Tenderness in a specific area.

This research contains Active Trigger Points, which are responsible for Myofascial Pain Syndrome and generate spontaneous pain. Therapeutic intervention can be quite beneficial in treating Myofascial Pain Syndrome.

Researchers have used a variety of techniques in an attempt to treat myofascial trigger points, according to Doaa Ibrahim Amin. Techniques like IASTM and DECOMPRESSION THERAPY, exercise therapy, different modalities of electro therapy, progressive pressure releases, spray and stretch, and post isometric contractions have previously been used to treat myofascial trigger points.

As a result, this research offers therapeutic interventions like as IASTM and decompression therapy.

IASTM creates tissue microtrauma which is believed to increase a local inflammatory response which improves the breakdown of scar tissue, release of myofascial adhesions, synthesis of new collagen and corrective tissue remodeling Russell T. studied the IASTM treatment for tissue extensibility dysfunction which concluded that there is clinically significant change in the NPRS score for pain. The result also stated that IASTM application with passive motion also had improvements over the range of motion. This study supports our study which states that there is reduce in pain after the application of IASTM

IASTM enables for a more precise and adequate Cross-Fiber Massage than the hand alone. According to M. Terry Loghmani (et al 2009), Cross Fiber Massage mobiles the skin in a transverse manner to underlying collagen Fiber alignment.

When soft tissue heals after injury or immobilisation, external mechanical load influences the extracellular matrix of the connective tissue and encourages fibroblast proliferation, which realigns the collagen fibres that are uneven.

According to Janet Mc. Murray et al. (2015), when a controlled quantity of microtrauma is administered, collagen deposition and maturation are ideal.

M. Terry Loghmani (2009) supports the increase in pain threshold in the IASTM group, stating that IASTM offers accurate and focused distribution of force, higher sensitivity during palpation and examination of tissue, which typically improves clinician's mechanical advantage and ergonomics.

Cupping can produce comfort and relaxation on a systemic level, and the consequent rise in endogenous opioid production in the brain leads to greater pain control, according to a growing body of data.

According to several researchers, the primary effect of cupping therapy is to improve blood circulation and eliminate toxins and waste from the body.

This could be accomplished by enhancing microcirculation, stimulating capillary endothelial cell repair, and accelerating granulation and angiogenesis in regional tissues, hence assisting in the normalisation of the patient's functional status and progressive recovery.

M. Terry Loghmani (2009) supports the increase in pain threshold in the IASTM group, stating that IASTM offers accurate and focused distribution of force, higher sensitivity during palpation and examination of tissue, which typically improves clinician's mechanical advantage and ergonomics.

Cupping can produce comfort and relaxation on a systemic level, and the consequent rise in endogenous opioid production in the brain leads to greater pain control, according to a growing body of data.

5. Conclusion

It can be concluded from the above study that both IASTM and DECOMPRESSION THERAPY proved to be effective in the treatment of calf muscle trigger points, but IASTM proved to be more effective than decompression therapy in the treatment if calf muscle trigger points in security guards after statistical analysis.

Future Scope of Study

Future studies can include female security guards too and male security guards working in different work setup, other long-standing professionals can also be included in the study, such as military personals, teachers, police men, traffic police.

References

1. McLean SM, May S, Klaber-Moffett J, et al. . Risk factors for the onset of non-specific neck pain: A systematic review. *J Epidemiol Community Health* 2010;64:565–572]
2. Simons DG, Travell JG, Simons LS. Travell & Simons' Myofascial Pain and Dysfunction: Upper Half of Body (Vol. 1). Philadelphia, PA: Lippincott Williams & Wilkins, 1999]
3. Fernández-de-Las-Peñas C, Alonso-Blanco C, Miangolarra JC. Myofascial trigger points in subjects presenting with mechanical neck pain: A blinded, controlled study. *Manual Ther* 2007;12:29–33 [PubMed] [Google Scholar]
4. Gerwin RD. Diagnosis of myofascial pain syndrome. *Phys Med Rehabil Clin N Am* 2014;25:341–355 [PubMed] [Google Scholar]
5. Alvarez DJ, Rockwell PG. Trigger points: Diagnosis and management. *Am Fam Physician* 2002;65:653–662 [PubMed] [Google Scholar]
6. Kisilewicz A, Janusiak M, Szafraniec R, et al. . Changes in muscle stiffness of the Trapezius muscle after application of ischemic compression into myofascial trigger points in professional basketball players. *J Hum Kinet* 2018;64:35–45 [
7. Choi YH, Jung SJ, Lee CH, Lee SU. Additional effects of transcranial direct-current stimulation and trigger-point injection for treatment of myofascial pain syndrome: A pilot study with randomized, single-blinded trial. *J Altern Complement Med* 2014;20:698–704 [PubMed] [Google Scholar]
8. Moraska AF, Schmiege SJ, Mann JD, et al. . Responsiveness of myofascial trigger points to single and multiple trigger point release massages: A randomized, placebo controlled trial. *Am J Phys Med Rehabil* 2017;96:639–645 [PMC free article] [PubMed] [Google Scholar]
9. Tang L, Li Y, Huang Q-M, Yang Y. Dry needling at myofascial trigger points mitigates chronic post-stroke shoulder spasticity. *Neural Regen Res* 2018;13:673–673 [PMC free article] [PubMed] [Google Scholar]
10. Behrangrad S, Kamali F. Comparison of ischemic compression and lumbopelvic manipulation as trigger point therapy for patellofemoral pain syndrome in young adults: A double-blind randomized clinical trial. *J Bodyw Mov Ther* 2017;21:554–564 [PubMed] [Google Scholar]
11. Cao H, Li X, Liu J. An updated review of the efficacy of cupping therapy. *PLoS One* 2012;7:e31793. [PMC free article] [PubMed] [Google Scholar]
12. Cagnie B, Dewitte V, Coppieters I, et al. . Effect of ischemic compression on trigger points in the neck and shoulder muscles in office workers: A cohort study. *J Manipulative Physiol Ther* 2013;36:482–489 [PubMed] [Google Scholar]
13. Cagnie B, Castelein B, Pollie F, et al. . Evidence for the use of ischemic compression and dry needling in the management of trigger points of the upper trapezius in patients with neck pain: A systematic review. *Am J Phys Med Rehabil* 2015;94:573–583 [PubMed] [Google Scholar]
14. Bialosky JE, Bishop MD, Price DD, et al. . The mechanisms of manual therapy in the treatment of musculoskeletal pain: A comprehensive model. *Manual Ther* 2009;14:531–538 [PMC free article] [PubMed] [Google Scholar]
15. Lone AH, Ahmad T, Anwar M, et al. . Leech therapy-a holistic approach of treatment in unani (greeko-arab) medicine. *Anc Sci Life* 2011;31:31. [PMC free article] [PubMed] [Google Scholar]
16. Bridgett R, Klose P, Duffield R, et al. . Effects of cupping therapy in amateur and professional athletes: Systematic review of randomized controlled trials. *J Altern Complement Med* 2018;24:208–219 [PubMed] [Google Scholar]

17. Simons DG. Diagnostic criteria of myofascial pain caused by trigger points. *J Musculoskelet Pain* 1999;7:111–120 [Google Scholar]
18. Kumbhare DA, Elzibak AH, Noseworthy MD. Assessment of myofascial trigger points using ultrasound. *Am J Phys Med Rehabil* 2016;95:72–80 [PubMed] [Google Scholar]
19. Mikkelsson M, Latikka P, Kautiainen H, et al. . Muscle and bone pressure pain threshold and pain tolerance in fibromyalgia patients and controls. *Arch Phys Med Rehabil* 1992;73:814–818 [PubMed] [Google Scholar]
20. Park G, Kim CW, Park SB, et al. . Reliability and usefulness of the pressure pain threshold measurement in patients with myofascial pain. *Ann Rehabil Med* 2011;35:412–417 [PMC free article] [PubMed] [Google Scholar]
21. Vernon H. The neck disability index: State-of-the-art, 1991–2008. *J Manipulative Physiol Ther* 2008;31:491–502 [PubMed] [Google Scholar]
22. Young IA, Cleland JA, Michener LA, et al. . Reliability, construct validity, and responsiveness of the neck disability index, patient-specific functional scale, and numeric pain rating scale in patients with cervical radiculopathy. *Am J Phys Med Rehabil* 2010;89:831–839 [PubMed] [Google Scholar]
23. Young BA, Walker MJ, Strunce JB, et al. . Responsiveness of the neck disability index in patients with mechanical neck disorders. *Spine J* 2009;9:802–808 [PubMed] [Google Scholar]
24. Toprak M, Alptekin HK, Turhan D. Correction to: P-12 assessment of symmetrigraph and global postural system results for the posture analysis of the healthy individuals. *Chiropr Man Therap* 2018;26:20–20 [PMC free article] [PubMed] [Google Scholar]
25. Cramer H, Lauche R, Hohmann C, et al. . Randomized controlled trial of pulsating cupping (pneumatic pulsation therapy) for chronic neck pain. *Complement Med Res* 2011;18:327–334 [PubMed] [Google Scholar]
26. Chi LM, Lin LM, Chen CL, et al. . The effectiveness of cupping therapy on relieving chronic neck and shoulder pain: A randomized controlled trial. *Evid Based Complement Alternat Med* 2016;2016:1–7 [PMC free article] [PubMed] [Google Scholar]
27. Gemmell H, Miller P, Nordstrom H. Immediate effect of ischaemic compression and trigger point pressure release on neck pain and upper trapezius trigger points: A randomised controlled trial. *Clin Chiropr* 2008;11:30–36 [Google Scholar]
28. Wilke J, Vogt L, Banzer W. Immediate effects of self-myofascial release on latent trigger point sensitivity: A randomized, placebo-controlled trial. *Biol Sport* 2018;35:349–354 [PMC free article] [PubMed] [Google Scholar]
29. Aguilera FJM, Martín DP, Masanet RA, et al. . Immediate effect of ultrasound and ischemic compression techniques for the treatment of trapezius latent myofascial trigger points in healthy subjects: A randomized controlled study. *J Manipulative Physiol Ther* 2009;32:515–520 [PubMed] [Google Scholar]
30. Hou CR, Tsai LC, Cheng KF, et al. . Immediate effects of various physical therapeutic modalities on cervical myofascial pain and trigger-point sensitivity. *Arch Phys Med Rehabil* 2002;83:1406–1414 [PubMed] [Google Scholar]
31. Hong SH, Wu F, Lu X, et al. . Study on the mechanisms of cupping therapy. *Zhongguo Zhen Jiu* 2011;31:932–934 [PubMed] [Google Scholar]
32. Lauche R, Cramer H, Hohmann C, et al. . The effect of traditional cupping on pain and mechanical thresholds in patients with chronic nonspecific neck pain: A randomised controlled pilot study. *Evid Based Complement Alternat Med* 2012;2012:1–10 [PMC free article] [PubMed] [Google Scholar]
33. Emerich M, Braeunig M, Clement HW, et al. . Mode of action of cupping—Local metabolism and pain thresholds in neck pain patients and healthy subjects. *Complement Ther Med* 2014;22:148–158 [PubMed] [Google Scholar]
34. Kim KH, Kim TH, Hwangbo M, Yang GY. Anaemia and skin pigmentation after excessive cupping therapy by an unqualified therapist in Korea: A case report. *Acupunct Med* 2012;30:227–228 [PubMed] [Google Scholar]
35. Ganesh GS, Singh H, Mushtaq S, et al. . Effect of cervical mobilization and ischemic compression therapy on contralateral cervical side flexion and pressure pain threshold in latent upper trapezius trigger points. *J Bodyw Mov Ther* 2016;20:47.