"COMPARISON BETWEEN EFFECTIVENESS OF INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION VERSUS CUPPING THERAPY ON MUSCULOFASCIAL TRIGGER POINT FOR NON-SPECIFIC LOW BACK PAIN ON COLLEGIATE ATHLETES"

Dr. Manash Kanti Chakraborty(PT), Sameer Purohit,

ABSTRACT

BACKGROUND: Low back pain is a highly prevalent health problem that is associated with enormous costs worldwide. In developed countries, episodes of back pain are a leading cause of work absence, accounting for over 25% of all conditions involving days away from work. About 90% of the patients with low back pain will receive the diagnosis 'non-specific low back pain' (NSLBP), a term that signifies that no specific pathology or disease process has been identified by the clinician. Although pain improves rapidly in the first month with a typical episode of NSLBP, low levels of pain may continue for many months.**AIMS AND OBJECTIVES**: To compare the effectiveness between Instrument- assistedsoft tissue mobilization (IASTM) versus Cupping therapy on musculofascial triggerpoint for nonspecific low back pain on collegiate athletes.

1) To evaluate the effects of Instrument-assisted soft tissue mobilization IASTM in musculofascial trigger point for nonspecific low back pain on collegiate athletes.

2) To evaluate the effects of Cupping therapy in musculofascial trigger point for nonspecificlow back pain on collegiate athletes.

3) To compare the effectiveness between Instrument-assisted soft tissue mobilization techniques (IASTM) and Cupping therapy in musculofascial trigger point for nonspecific lowback pain on collegiate athletes. **METHODOLOGY:** Comparative study design. 40 Patient were randomly selected according to inclusion and exclusion criteria and were divided into two groups – Group A: and Group B: Duration of Study: 30 minutes per day, 5days in a week, total 12 Weeks. **CONCLUSION:** From the result of the study it concludes that after 12weeks of treatment both Instrument-assisted soft tissue mobilization techniques (IASTM) & Cupping therapy is significantly effective in treatment of musculofascial trigger point for non-specific low back pain in collegiate athlete, but in comparison Instrument-assisted soft tissue mobilization techniques (IASTM) is more effective than Cupping therapy.

KEY POINTS: Low Back pain, IASTM, Cupping Therapy

INTRODUCTION

Low back pain is a highly prevalent health problem that is associated with enormous costs worldwide[1,2,3]. In developed countries, episodes of back pain are a leading cause of work absence, accounting for over 25% of all conditions involving days away from work[4,5]. About 90% of the patients with low back pain will receive the diagnosis 'non-specific low back pain' (NSLBP), a term that signifies that no specific pathology or disease process has been identified by the clinician. Although pain improves rapidly in the first month with a typical episode of NSLBP, low levels of pain may continue for many months[6].

Work-related musculoskeletal disorders (WMSDs) are common in jobs requiring manual handling, heavy lifting, and/or repetitive motions[7] WMSDs are frequent among health care professionals due to patient handling and transfers[8].

Musculoskeletal disorders are present in 48% of work-related disorders and diseases among patients visiting a general practitioner[9]. Work-related musculoskeletal disorders (WRMSDs) arise from repetitive work activities that normally are not hazardous, which become hazardous when the tissue loading exceeds its anatomical and physiological limits[10]. These situations often lead to development of overuse syndromes, persistence of symptoms thus becoming recurrent and/or chronic.[11] Tissue healing never actually gets accomplished since re-injury occurs due to repeated exposure to occupational risk factors[12]

The physical ergonomic features of work frequently cited as risk factors for MSDs include rapid work pace and repetitive motion, forceful exertions, non-neutral body postures, and vibration.[13] The overall global prevalence for WRMSDs is 20%-30% and the region more often reported to be affected was the low back[14]

According to the world health organization (WHO) technical report, the management of WRMSDs determine to a largest possible extent the global productivity and work performance of working-age adults.[15] Prevalence of WRMSDs had been previously reported for children, general adult population, industrial workers, computer professionals and lately though among healthcare professionals[16]. Studies reported prevalence of WRMSDs among nurses,[21] physical therapists, physicians, surgeons, and dentists[17].

Approximately 84% of people are reported to have an experience of back pain in their life time1). Although there is no obvious cause of low back pain, 90% of patients have been experienced back pain without certain pathology, referred to as non-specific low back pain (NSLBP)[18,19]

Non-specific low back pain (NSLBP) is the most widespread form of LBP[20]. NSLBP is called LBP without recognizable specific underlying pathology[21]. The prevalence and burden of LBP increases with aging[22]. This situation is more common and complex in elderly people[23,24]. Because of the changes in fascia structures, dysfunction of deep muscles of back and trunk is common in chronic LBP[25,26.]

Injuries of low back are mostly caused from the superficial back line (SBL), The SBL contains the plantar fascia, gastrocnemius muscles, hamstring muscles, lumbosacral fascia, erector spinae muscles and epicranial fascia[27]. The deep muscles of back and trunk are attached to the superficial back line via thoracolumbar fascia[28]. These deep muscles and fascia of the trunk form a continuous musculofascial corset-like system[29,30].

The use of various non-pharmacological and non-invasive methods such as exercise, mobilization, and manipulation are well known in LBP treatment[31,32,33]. Core stability exercise is a common exercise modality in the treatment of LBP[34]

To decrease pain and increase back specific functional status in patients with LBP, core stability exercise is more effective than general exercise[35]. Core stability exercises improve the strength of deep muscles of trunk and low back disability in older adult women with NSLBP[36]. Myofascial release technique is another method among the possible management options in the treatment of chronic musculoskeletal pain[37]. It has been demonstrated that myofascial release techniqueproduces a significant improvement in both pain and disability[38]

It is recommended for patients with NSLBP to remain physically active, as long periods of inactivity will adversely affect recovery[39,40]. A variety of different types of exercise have been explored to treat CLBP (chronic low back pain), including low-to-moderate intensity aerobic exercise, high intensity aerobic exercise, core stabilization and muscular strength exercises and flexibility programs[41,42]. However, the most effective form of exercise as a method of rehabilitation for NSCLBP is unknown reflecting its complexity and more research is required[43]. Physical activity (PA) to increase aerobic capacity and muscular strength, especially of the lumbar extensor muscles, is important for patients with CLBP in assisting them to complete activities of daily living[44]. However, different exercises have been found to result in varying levels of effectiveness in reducing lower backpain[45]. In addition, too much or too little PA can be associated with low back pain suggesting that PA as an intervention for low back pain is complex[46.]

Myofascial pain syndrome is defined as sensory, motor, and autonomic symptoms resulting from painful spots in the fascia surrounding skeletal muscle known as myofascial trigger points (MTrPs)[47,48]. MTrPs are associated with palpable nodules in taut bands of muscle fibers. Compression of these points may elicit a) motor dysfunction, b) local and referred tenderness, c)

pain perceived at a different spot than the site of the painful stimulus (referred pain), d) transient contraction of the muscle (local twitch response) and e) autonomic phenomena. Diagnostic findings of MTrPs include severe ROM limitation, a palpable taut band with exquisitely tender nodule and familiar to patient pain elicited from pressure on painful Spots (jump sign) [49,50].

Etiology of myofascial pain is multifactorial including poor ergonomy and body biomechanics, acute or repetitive trauma, excessive or no exercise and vitamin deficiency [51,52]. Other factors contributing to the development of MTrPs include psychosocial factors, such as high job pressure, psychological stress and anxiety [52,53].

MTrPs are thought to be involved in pain in tension headaches, low back pain syndromes; pelvic pain; and musculoskeletal pathologies such as bursitis, tendinopathies, and muscle strains [54,55]. MTrPs can be seen in the setting or athletic injury due to muscle asymmetries and imbalances, postural deficiencies, or secondary to repetitive injury and training overloading. Evidence to date reinforces the theory that MTrPs develop after muscular overuse and especially after eccentric overloading and submaximal- maximal concentric contractions [56,57].

A key factor is a localized ischemia, leading to the subsequent release of several inflammatory mediators in muscle tissue through a pH reduction[58]. Examples of the latter include MTrPs in quadratus lumbar in association with lumbar pathologies or gluteal trigger points in the presence of hip and pelvis overloading[59]

More specifically, myofascial pain arising from trigger points in the low-back and gluteal region is a typical presentation in athletes who overload the hip area with shear forces like soccer players This type of myofascial pain may be local or referred and in the majority of the cases, is reproduced by the application of digital pressure to gluteal muscle trigger points [61].

Instrument-assisted soft tissue mobilization techniques (IASTM) and cupping therapy techniques are procedures rapidly growing in popularity amongst athletes due to their effectiveness and efficiency in treating soft tissue restrictions while remaining non-invasive. Instrument-assisted soft tissue mobilization techniques (IASTM) use special stainless steel instruments that enable clinicians to locate efficiently and treat soft tissue dysfunctions, such as fibrosis, adhesions, chronic inflammation, or degeneration [62,63].

Benefits from Instrument-assisted soft tissue mobilization techniques (IASTM) use include increased fibroblast proliferation, reduction in scar tissue and adhesions, increased vascular response, and remodeling of disorganized collagen fiber matrix[64]. Instrument-assisted soft tissue mobilization techniques (IASTM) technique also has been found that it results in clinical benefits such as improvements in range of motion, strength and pain perception following treatment[65,66] . Despite extensive use of Instrument-assisted soft tissue mobilization techniques (IASTM) research regarding its effect on myofascial pain reduction, is limited. Gulick reported that Instrument-assisted soft tissue mobilization techniques (IASTM) (Graston Technique) does not differ regarding effectiveness on upper back MTrPs release compared to the control group [67].

Cupping is a therapeutic method that utilizes a glass or plastic cup to create negative pressure on the skin over a painful area for muscle spasm and pain reduction. The mechanism of cupping therapy is not clear, but some researchers suggest that placement of cups on the skin produces hyperemia, fascial release, and local stretching. Nevertheless, its therapeutic effect has not been proven through valid randomized control studies [68].

Cupping is a traditional Chinese medicine (TCM) therapy dating back at least 2,000 years. Types of cupping include retained cupping, flash cupping, moving cupping, wet cupping, medicinal cupping, and needling cupping [69]. The actual cup can be made of materials such as bamboo, glass, or earthenware.

In our previous study, we conducted a systematic literature review based on available clinical studies published from 1958 through 2008 [71]. We concluded that the majority of the 550 included studies showed that cupping is of potential benefit for pain conditions, herpes zoster, and cough and dyspnea[72]. Five other systematic reviews on cupping therapy have also been published, focusing on pain conditions, stroke rehabilitation, hypertension, and herpes zoster, respectively. The numbers of included trials in these reviews were quite small (between 1and 8 trials)[73]. Lee et al. conducted an overview of these five reviews and concluded that cupping is only effective as a treatment for pain, and even for this indication doubts remain. Aim of study determined to find out the effectiveness on Instrument-assisted soft tissue mobilization techniques (IASTM) versus Cupping therapy.

Mechanical low back pain (MLBP) is defined as low back pain not attributable to recognizable, known specific pathology. It is the leading cause of disability amongst the major musculoskeletal conditions which leads to Impairments, Activity limitations and Participation restrictions. Therefore it becomes a psychosocial/economic burden on individuals, families, communities, industries and government. Existing literature shows globally 40% to 50% of people have LBP at some point in their lives and there exists a challenge in Africa on the best rehabilitation methods for low back pain which could prevent chronic pain and disability as evident in a literature[74].

The lifetime prevalence of low back pain (LBP) in industrial countries is at 84% (Hildebrandt et al., 2004)[75]. Approximately 85% of such back pain is classified as non-specific, which means that no structural change, no inflammation and no specific disease can be found as its cause (O‟ Sullivan, 2005)[76].

Typically, LBP is classified as follows: Specific pain caused by unique or unusual pathophysiologic mechanisms (disc herniation, tumor, osteoporosis, arthritis, diseases, trauma, mechanical disorders or spinal pathology) Nonspecific pain not caused by a specific disease or spine pathology Acute pain lasting less than 6 weeks Subacute pain lasting 6–12 weeks Chronic

pain lasting longer than 12 weeks.[77]

CNSLBP is generally defined as pain, muscle tension, or stiffness localized below the costal margins (ribs) and above the inferior gluteal folds with or without leg pain (sciatica)[79].

Persons with CNSLBP are typically treated with nonsteroidal anti-inflammatory drugs and acetaminophen and are advised to stay active and avoid bed rest[80].

Occasionally, muscle relaxants and narcotic analgesics, which can cause drowsiness, increased reaction time, and impaired judgment, are prescribed for severe pain. CNSLBP can contribute to the following: Recurring pain and increased severity Lost work time Decreased health-related quality of life (HRQOL) Decreased neuromuscular function Decreased physical fitness, strength, and function Decreased PA levels Fear/avoidance of PA secondary to pain anticipation[81].

Exercise response limitations are typically affected by the following: Individual pain severity and location Physical fitness and strength Body positions required during exercise testing and training. Prolonged standing, sitting, and frequent bending (trunk flexion) can exacerbate CNSLBP symptoms and prevent clients from obtaining their best exercise and/or testing efforts. Exercise has been shown to be effective in increasing PA tolerance, physical fitness, strength, HRQOL, pain tolerance, and over all PA participation levels in persons with CNSLBP[82].

Although home-based exercise programs have been found to be beneficial, significantly greater physical benefits and compliance rates have been observed in persons engaging in supervised individualized exercise programs. Both aerobic training (AT) and resistance training (RT) programs have produced increased PA tolerance, physical fitness, and HRQOL in persons with CNSLBP.Periodized progressive RT programs have been well tolerated and proven effective forincreasing strength and PA participation levels and in reducing disability levels in sedentary and athletic populations with CNSLBP[83]. No literature has found to compare these two techniques so this study has designed.

AIM OF THE STUDY

To compare the effectiveness between Instrument-assisted soft tissue mobilization (IASTM) versus Cupping therapy on musculofascial trigger point for non specific low back pain on collegiate athletes.

METHODOLOGY

Study Design: Comparative study

Sample Design: Convenient Sampling

Sample Size: 40 patients diagnosed with nonspecific low back pain

Duration of study: 12 Weeks (30 minutes per day, 5days in a week.)

Study center: PMCH, UDAIPUR

INCLUSION CRITERIA

1) Both male and female collegiate athletes.
2) Age of 18-25 years
3) Nonspecific low back pain

EXCLUSION CRITERIA

1) Open wound
2) Neurological problem
3) Cardiovascular symptoms
4) Skin Infections
5) Recent spinal fracture
6) Spondylolisthesis, spondylosis
7) Any systemic disease or TB of spine
8) Any recants spine surgery
9) Mentally retardation
10) Incorporating patient

OUTCOME MEASURES

- **VISUAL ANALOGUE SCALE (VAS)**
- **OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE (OLBPDQ)**

PROCEDURE

- After collecting the written consent form the patients selected by inclusion and exclusioncriteria, they were divided into two group- Group A and Group B.
- Group A treated with Instrument-assisted soft tissue mobilization (IASTM) onmusculofascial trigger point.
- Group B treated with Cupping therapy on musculofascial trigger point.
- All the pre and post data of outcome measures kept safely for analyzing.

GROUP A: Instrument-assisted soft tissue mobilization techniques (IASTM) Step 1: Before and after treatment the clinician's hands should be cleaned. hand washing with soap and water or rubbing hands together using an alcohol-based handsanitizer (e.g., gel or wipe) for a minimum of 15 seconds. Wear gloves during treatment but should still follow pre and post hand hygiene procedures.

Step 2: Before treatment, the body region is inspected and cleared for treatment. Thenthe patient's skin (at the treatment site) is cleaned with a low-level sanitizing wipe thatis safe for the skin, or 60-70% isopropyl alcohol to further reduce the risk of infection.

Step 3 The Instrument-assisted soft tissue mobilization (IASTM) treatment is using thelubricant.

Step 4 During the treatment monitors for changes in the patient's status (e.g., skin colorchanges such as petechiae, sensitivity to treatment, etc.)

Step 5 Upon completion of treatment, the body region is re-inspected and cleanedagain using a sanitizing wipe or isopropyl alcohol.

Step 6 concludes with post treatment hand hygiene, and cleaning of the instruments

Figure 1 INSTRUMENT-ASSISTED SOFT TISSUEMOBILIZATION (IASTM) THERAPY

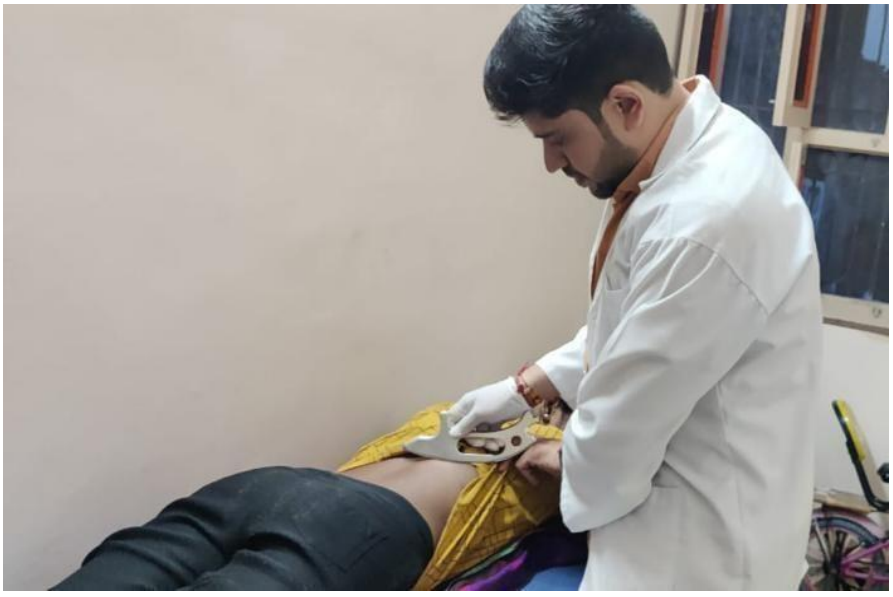


Figure 2 INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION (IASTM) THERAPY

GROUP B: Cupping therapy

Step 1: Moving Cupping -Patient in prone lying on bed -Apply lubricant gel on lower back area. - A partial suction created inside the cup. - The cup will be move around low back area until the skinbecome reddish.

Step 2: Cupping -4 cups applied on lower back covering. Left it for 15 minutes to vacuum the skin. The patients will have residual marking after the wet cupping therapy and it will disappear3-5 days.

Figure 3 CUPPING THERAPY FOR NONSPECIFIC LBP

Figure 4 CUPPING THERAPY FOR NONSPECIFIC LBP

RESULTS

After screening of the 60 patients for study eligibility, a total of 40 patients were included for analysis, of whom 20 were in the Group A INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION (IASTM) and 20 were in the Group B CUPPING THERAPY.

Analysis pre and post test score within and between the values of groups are tabulised with intervention of the result of the study.

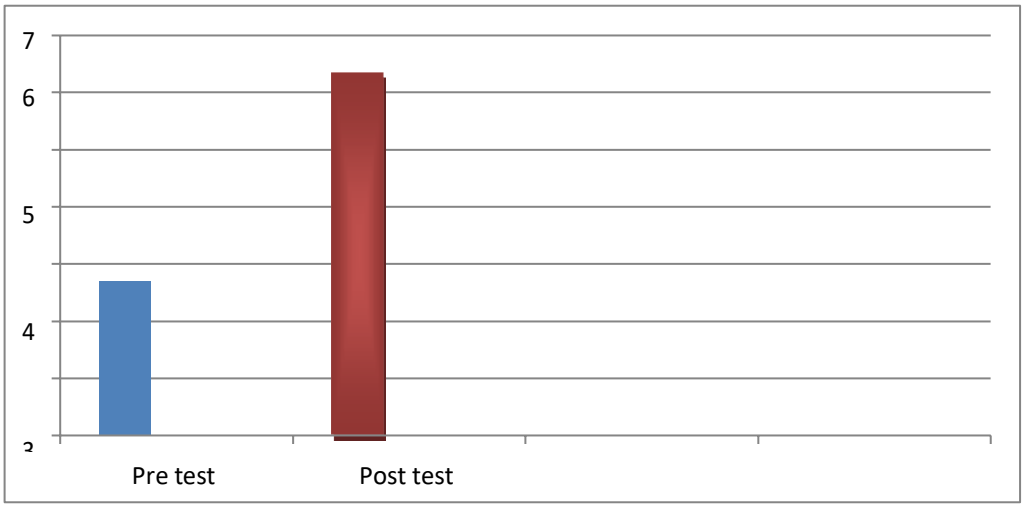
TABLE.1

A. WITHIN GROUP: -

GROUP A

VISUAL ANALOGUE SCALE (VAS)	N	MEAN	S.D	S.E.M
PRE TEST	20	2.7	1.38	0.3
POST TEST	20	6.35	1.92	0.43

GRAPH 1

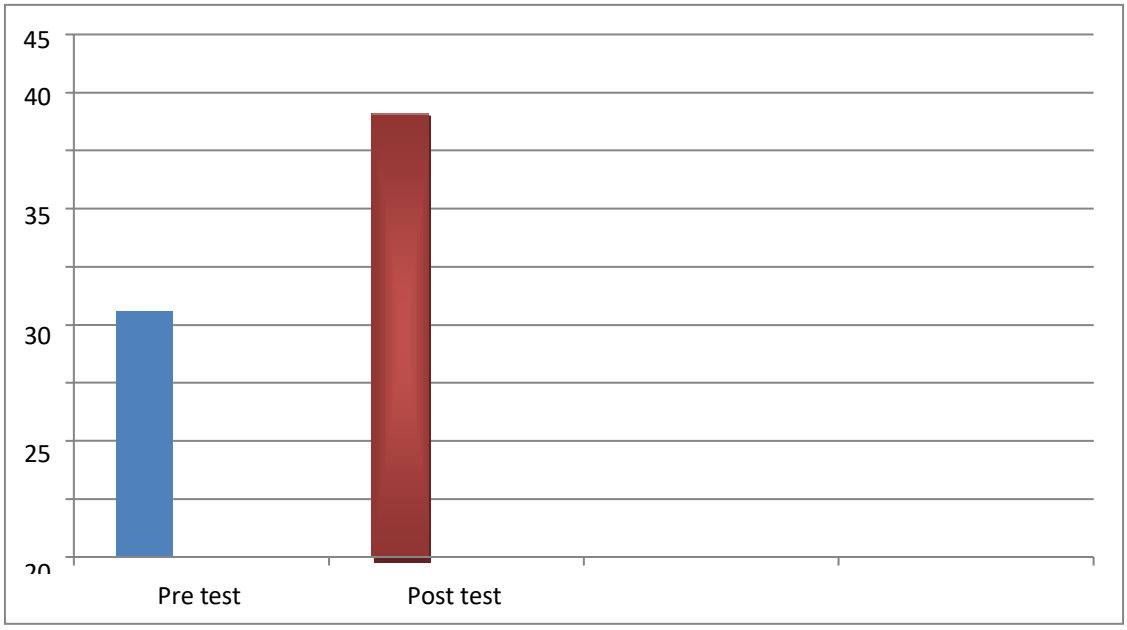


INTERPRETATION:

The above table and graph show the comparison of score of VISUAL ANALOGUE SCALE(VAS) pre and post test values within group A.

TABLE.2

OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE (OLBPDQ)	N	MEAN	S.D	S.E.M
PRE TEST	20	21.2	8.5	1.9
POST TEST	20	38.45	7.98	1.78



GRAPH 2

INTERPRETATION:

The above table and graph show the comparison of score of OSWESTRY LOW BACK PAIN

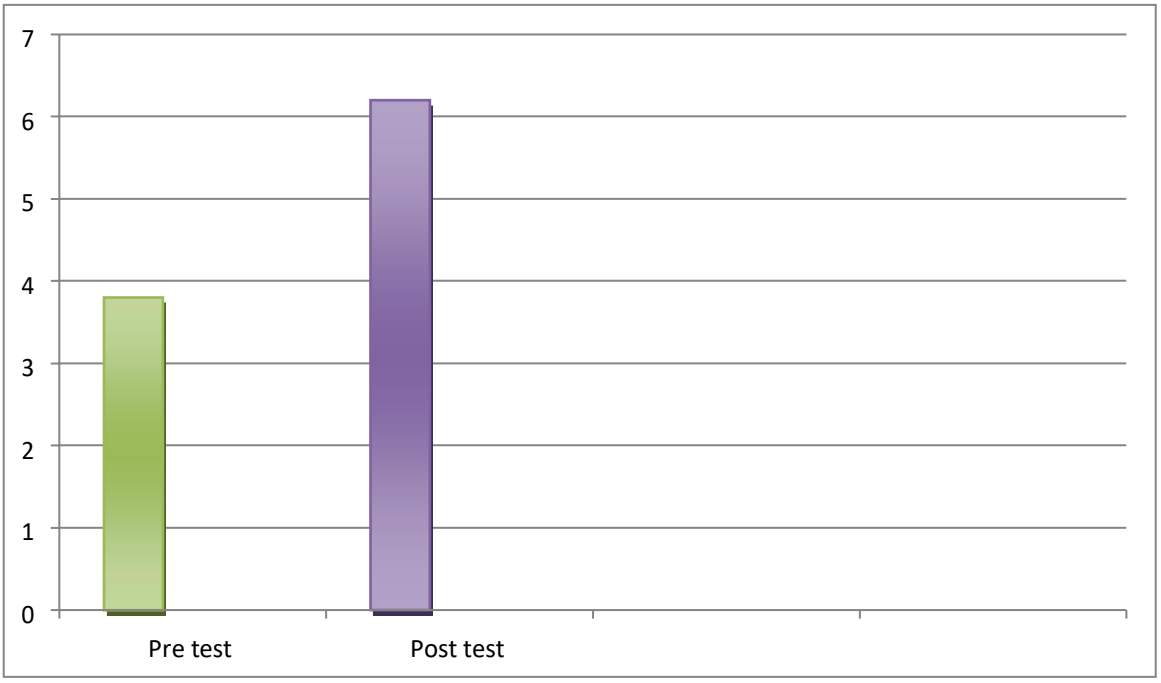
DISABILITY QUESTIONNAIRE (OLBPDQ) pre and post test values within group A.

TABLE.3

GROUP B

VISUAL ANALOGUE SCALE (VAS)	N	MEAN	S.D	S.E.M
PRE TEST	20	3.8	1.36	0.3
POST TEST	20	6.2	1.98	0.44

GRAPH 3



INTERPRETATION:

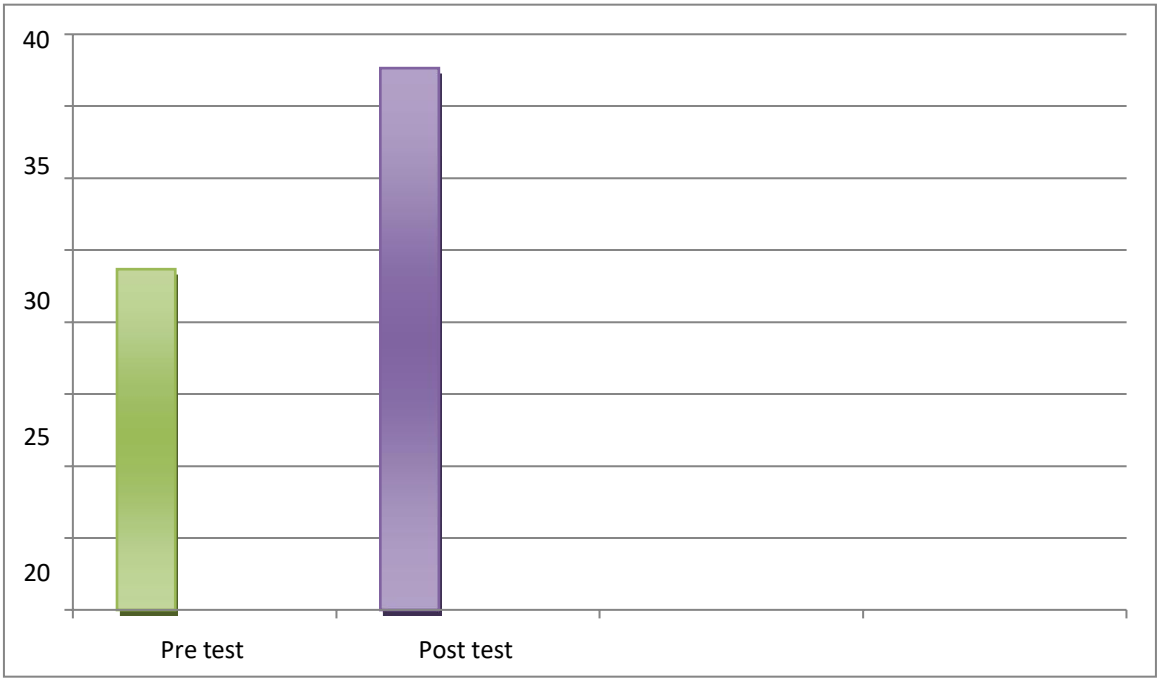
The above table and graph show the comparison of score of VISUAL ANALOGUE

SCALE(VAS) pre and post test values within group B.

TABLE.4

OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE (OLBPDQ)	N	MEAN	S.D	S.E.M
PRE TEST	20	23.7	8.88	1.98
POST TEST	20	37.65	7.63	1.7

GRAPH 4



INTERPRETATION:

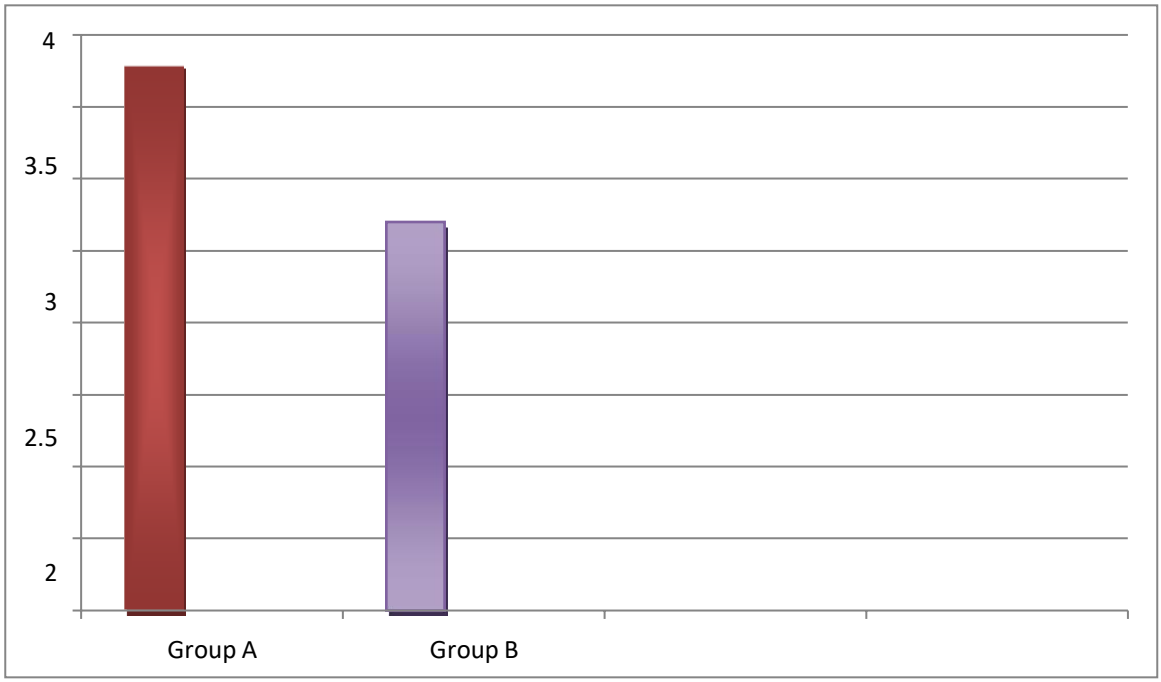
The above table and graph show the comparison of score of OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE (OLBPDQ) pre and post test values within group B

TABLE.5

VISUAL ANALOGUE SCALE (VAS)

POST TEST	N	MEAN	S.D	S.E.M	P	T
GROUP A	20	3.8	1.36	0.3	0.01	2.53
GROUP B	20	2.7	1.38	0.3		

GRAPH 5



INTERPRETATION:

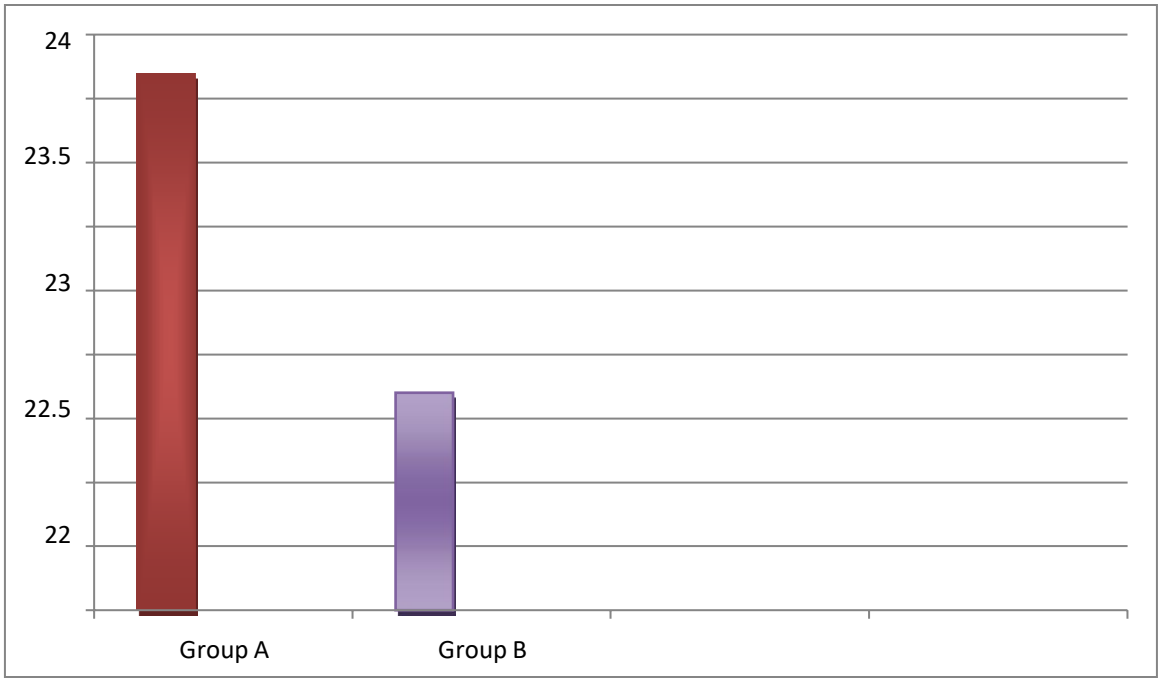
The above table and graph show the comparison of score of VISUAL ANALOGUE SCALE(VAS) post test values between group A and group B

TABLE.6

OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE (OLBPDQ)

POST TEST	N	MEAN	S.D	S.E.M	P	T
GROUP A	20	23.7	8.88	1.98	0.36	0.90
GROUP B	20	21.2	8.5	1.9		

GRAPH 6



INTERPRETATION:

The above table and graph show the comparison of score OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE post test values between group A and group B.

DISCUSSIONS

We experienced the hypothesis that a single session of Instrument-assisted soft tissue mobilization (IASTM) and CUPPING would be adequate to decrease pain and improve disability in individuals with LBP temporarily. The results show partially confirmed the hypothesis. While a single session of Instrument-assisted soft tissue mobilization (IASTM) and CUPPING was in effect to reduce pain intensity for a moment and improve disability.

The first question to be elucidated is the initial improvement of pain severity domains of the VAS after a single session of cupping. As a result, the patients presented a reduced VAS and OLBPDQ after one session of Instrument-assisted soft tissue mobilization (IASTM) and Cupping therapy.

The reason why this could occur may be advised because Instrument-assisted soft tissue mobilization (IASTM) and CUPPING blocks pain sensory afferents. The data of evidence of Instrument-assisted soft tissue mobilization (IASTM) and CUPPING in the treatment of pain appears positive. The data advocate usefulness of cupping decreasing pain perception and enhancing function, and the benefits unexpectedly extend for one week.

The potential effects of cupping were recommended by Musial et al. who generally proposed three potential mechanisms of action for reflex therapies such as cupping: (1) pain reduction could be initiated by deforming the skin which may stimulate Ab fibers in painful skin regions, (2) manipulations may stimulate inhibitory receptive fields of the multi receptive dorsal horn neurons, and (3) the setting provides a feeling of relief from physical and emotional tensions and socially comforting effect.

Cupping need effect on disturbed neuro vegetative tasks and contaminated viscera and may affect the immune system in 2 ways: by irritating the immune system, which reasons local inflammation, and subsequently activates the accompaniment system, and improving the level of interferon and tumor necrotizing factor; or by growing the lymph flow, in which protein biosynthesis plays an important role.

In the current study, we have small sample size and the treatment of patients with non-specific LBP may have been a restrictive factor. Given these limits, a larger sample size and a study in different healthy volunteers or with other condition must be evaluated in future researches.

The current state of literature surrounding the effectiveness of Instrument-assisted soft tissue mobilization (IASTM) for pain in musculoskeletal conditions is unclear, although there is some evidence that warrants further investigation. Due to the paucity and heterogeneity of studies employing it, it is difficult to make meaningful clinical recommendations with respect to optimal Instrument-assisted soft tissue mobilization (IASTM) programs, including dosage time, frequency, and type of instrument.

Instrument-assisted soft tissue mobilization (IASTM) technique used in this study was proved superior in decreasing musculofascial trigger pain originated from lumbar and gluteal resion in compare with cupping therapy. Disabling myofascial pain after Instrument-assisted soft tissue mobilization (IASTM) application can be theoretically attributed to three main mechanisms that have been reported in the literature: a) local temperature and blood flow increase, b) localized tissue manipulation and stretch and c) reduction of fascial adhesions and restrictions. Instrument-assisted soft tissue mobilization (IASTM) techniques have been reported that effectively affects the fascial system of the human body treating fascial adhesions and constraints.

These “adhesions” can affect the muscular functions, reduce blood flow and nutrition of tissues, and can lead to the developmentof myofascial MTrPs. The blood-flow theory is lately supported by the findings of Portillo-Soto et al. in a study aiming at evaluating the effects of the Instrument-assisted soft tissue mobilization (IASTM) (Graston © Technique) and massage therapy on calf blood flow, using skin temperature measures.

The researchers reported that massage and Instrument-assisted soft tissue mobilization (IASTM) techniques increased skin temperature and thus local circulation significantly in twenty-eight participants. Furthermore, the researchers showed that the peak temperature was achieved at 25 minutes after treatment indicating that the therapeutic effects of Instrument-assisted soft tissue mobilization (IASTM) therapy remain in the place for several minutes after the end of the treatment.

The Instrument-assisted soft tissue mobilization (IASTM) technique used in this study is a more aggressive technique and with different application strokes than Graston© Technique. Furthermore, the selected Instrument-assisted soft tissue mobilization (IASTM) strokes were applied directly over the each MTrPS unlike Graston Instrument-assisted soft tissue mobilization (IASTM) maneuvers chosen by Gulick which were implemented in a more general fashion. The time of application also was different as each Instrument-assisted soft tissue mobilization (IASTM) stroke was applied for 3 minutes continuously on the MTrPS while the Graston© Instrument-assisted soft tissue mobilization (IASTM) strokes were applied consistently for one minute in the study of Gullic.

An ideal study evaluating the effect of various techniques on the reduction of adverse effects of MTrPs should assess the therapeutic effect of applied techniques in all the aspects of the functional capacity and must have long term evaluation and reevaluation planning However, the present study is innovative as it assessed comparatively the effect of two novel therapeutic applications such as the Instrument-assisted soft tissue mobilization (IASTM) and Cupping therapy on musculofascial trigger point for non-specific low back pain on collegiate athletes.

CONCLUSION

From the result of the study it concludes that after 12weeks of treatment both Instrument-assisted soft tissue mobilization (IASTM) & Cupping therapy is significantly effective in treatment of musculofascial trigger point for non-specific low back pain in collegiate athlete, but in comparison Instrument-assisted soft tissue mobilization (IASTM) is more effective than Cupping therapy.

LIMITATION AND RECOMMENDATION

LIMITATION

1. The study was limited due to shorter duration.
2. Small sample size.
3. Only two interventions applied & compared.

RECOMMENDATION

Further study could be performed with

1. It may be recommended that treatment course could be of prolong duration, so that more results could be evaluated.
2. Further study could be design with large number of sample size.
3. It may be recommended that study could be done on different age groups.
4. It may be recommended that study could be done by different interventions.

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