**A comparative study between the effectiveness of myofascial release versus cupping therapy for improving functional range of motion and reducing pain in collegiate student with non- specific neck pain**

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 **ABSTRACT**

BACKGROUD: young adulthood is a sensitive period of life where development of musculoskeletal neck pain may be established and impact future health. The objective of this systematic review was to investigate risk factors for non-specific neck pain in young adults. Non-specific neck pain (np) is defined as pain in the posterior and lateral aspect of the neck between the superior nuchal line and the spinous process of the first thoracic vertebra with no signs or symptoms of major structural pathology and no or minor to major interference with activities of daily life as well as with the absence of neurological signs and specific pathologies; such as: traumatic sprain and fracture, tumour, infectious or inflammatory cervical spondylolysis, etc.

AIMS AND OBJECTIVES: to analyse the effect of myofascial release versus cupping therapy for improving functional range of motion and reducing pain in collegiate student with non-specific neck pain

METHODOLOGY: Comparative study design. 30 patients with nonspecific neck pain were randomly selected according to inclusion and exclusion criteria and were divided into two groups group A: myofascial release with strengthening exercise and Group B: cupping therapy with strengthening exercise. study duration is 30 minute per day per subject 3 day in a week total 8 weeks.

CONCLUSION: We found a significant reduction in pain in each group after treatment. However, patients in Groups A showed more improvements in ROM and neck pain relief as they received strengthening exercises along with cupping therapy is an adjuvant treatment in the management of non-specific neck pain.

KEY WORDS: neck pain, cupping therapy, myofascial release, young adult.

**INTRODUCTION**

Neck pain is a common complaint in general population. Among diverse neck pain, mechanical neck pain is the most common type with pain confined in the posterior aspect of neck. Among diverse neck pains, mechanical neck pain affects 45-54% of the general population sometime during their lives and can result in severe disability1.

Mechanical neck pain also known as nonspecific neck pain has an acute or sudden onset of pain. Neck pain can be subdivided into upper cervical segment pain in which the pain is usually referred to the head and lower cervical segment pain in which the pain is referred to scapular region, shoulders, and upper limb2.

Pain develops in the neck and spreads up to the shoulder or to the base of the skull. Movement of the neck feels restricted and moving the neck may make the pain worse. Clinically it is common that patients with non-specific neck pain report problems with upper limb function in which the pain spreads down the arm, as far as to the fingers3.

Neck pain is most common in people with a working age group of 20-50 years and people employed in various jobs for example people who spend most of their working day at a desk with neck bent forward posture3. Mechanical neck pain can also result in referred pain to unilateral upper limb. A survey which was done in Kolkata on mechanical neck pain patients found that 67% of patients presented with associated upper limb pain without neurological deficit4.

Myofascial release techniques are used to help alleviate musculoskeletal pain. There are theories why myofascial release can help when dealing with musculoskeletal pain. These theories include 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 having a calm 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. Myofascial release’s ability to alleviate pain may relieve muscle spasm, which can be attributed to the application of direct pressure as well5.

Myofascial release is a widely employed direct manual medicine treatment which utilizes specifically guided mechanical forces to manipulate and reduce myofascial restrictions of various somatic dysfunctions. Myofascial release, when used with other conventional treatment, is effective to provide immediate relief of pain to reduce tissue tenderness6,7.

Cupping therapy (CT) is a traditional Chinese medical (TCM) treatment which has been practiced for thousands of years. The World Health Organization’s (WHO) definition of cupping is a therapeutic method involving the application of suction by creating a vacuum. This is typically done using fire in a cup or jar on the dermis of the affected part of the body15.

In Taiwan, approximately 12.8% of the participants reported the use of cupping therapies in the past year 16. The cupping mechanism constitutes creating a vacuum on the skin, with the ensuing negative pressure resulting in capillary rupture. This method is known as retained or dry cupping 17.

The skin of the localized area becomes flushed and may show petechiae and ecchymosis 18 or bruising, in which the duration is therapeutically beneficial19. Cupping has multiple therapeutic functions which include10 warming the channels to remove cold11, promoting qi and blood circulation12, relieving swelling13, accelerating healing14, adjusting body temperature15, fibromyalgia20,16 stroke rehabilitation, hypertension, musculoskeletal pain, herpes zoster 17, 21 facial paralysis, acne, and cervical spondylosis22, and alleviating pain23, including chronic neck24-26, shoulder pain11, and low back pain26,27.

The Visual Analogue Scale (VAS)has been in use for the measurement of intangible quantities such as pain, quality of life and anxiety since the 1920s 28. It consists of a line usually 100 mm in length, with anchor descriptors such as (in the pain context) “no pain” and “worst pain imaginable”, depicted in Fig. 1. The patient makes a mark reflecting his or her perception, and the distance from the left endpoint to the mark is measured, in mm. The VAS was initially used in psychology for the measurement of mood disorders, and was used for the measurement of pain from the mid-1960s29.

Goniometric measurements are used by physical therapists to quantify baseline limitations of motion, decide on appropriate therapeutic interventions, and document the effectiveness of these interventions. Probably our most widely used evaluation procedure, goniometry, can be considered a fundamental part of the "basic science" of physical therapy. Historically,

goniometry developed over the last 60 years in conjunction with the rapid growth of the field of physical medicine and rehabilitation. A recent article by Smith provides an interesting account of this development37.

To most physical therapists, however, the universal goniometer (i.e., full-circle manual goniometer) remains the most versatile and widely used instrument in clinical practice. The design of the universal goniometer and the procedures for its use have been described in detail in numerous publications38-45.

Reliability in goniometry simply means the consistency or the repeatability of the ROM measurements, that is, whether the application of the instrument and the procedures produce the same measurements consistently under the same conditions. We wish to emphasize from the outset that because few investigators have used the same study design, comparisons of the results of reliability studies often are difficult. For example, studies in which repeated tests are separated by short time intervals (i.e., one hour) may yield very different results than studies in which repeated tests are separated by longer time intervals (i.e., days or weeks).

The reliability of the measurements expresses their reproducibility or stability only in relation to the time intervals reported. The most accurate evaluation of the reliability of the instrument and procedures is determined when short time intervals separate tests, the classic "test-retest" study design. These results probably will be more reliable than the results of studies with long time intervals between tests because the accuracy of the measurements is increased with few uncontrolled variables. Despite of various non-pharmacological and non-invasive methods, no literature has found to compare effectiveness of myofascial release and cupping therapy for non-specific neck pain so this study designed.

METHODOLOGY

It is a comparative study in which patient was randomized in two group according to inclusion and exclusion criteria. In which 30 collegiate students with diagnosed non-specific neck pain for 8 weeks ( 30 mins session/day, 3 days/week ) in DEPARTMENT OF PHYSIOTHERAPY MANIPAL HOSPITAL, VIDHYADHAR NAGAR, JAIPUR RAJASTHAN.

INCLUSION CRITERIA:

• Age – 18 years to 30 years (college student)

• Student with non-specific neck pain

EXCLUSION CRITERIA:

• Any recent fracture in cervical spine

• Any recent injury in cervical spine

• Any neurological deficit

• Congenital deformity

• Presence of any tumour around the cervical spine.

**PROCEDURE**

After collecting the written consent form from the subject selected by inclusion criteria and exclusion criteria, they divided into two groups – Group A and Group B

Group A (n=15) were treated with cupping therapy (dynamic/static). Group B (n=15) were treated with myofascial release technique. Strengthen exercise for neck muscle was taught to both the groups. The treatment procedure would be 30 min session/day, 3 days/week for 8 weeks. All the pre and post score of outcome measure would be kept safely for analysis.

TREATMENT PROTOCOL FOR GROUP A

The group A consists of 15 patient who were treated with cupping therapy with strengthening exercise.

Treatment time – 30 minutes. (Cupping -10 minutes) Duration – 8 weeks (3 days in a week)

Cupping for upper Trapezius muscle: Identify the pain area and marked on the muscle. Then the patients were taken in sitting position, lubrication was applied over the mark point and 3 cups were applied (cup used of 65mm x 51mm). Cups were fixed on given area with the help of piston gun by creating a negative pressure (vacuum) inside the cup. 1 pump of air was removed from the cup initially to fix it on the area and after that according to participates feedback, more air was vacuumed with pump. A patient was asked for any discomfort during the session. after 10 minutes the cup were removed and next session was done after one day.

Cupping for Sternocleidomastoid muscle

Identify the pain area and marked on the muscle. Then the patient was taken in sitting position, lubrication was applied over the mark point and 2 cups were applied (cup used of size 61mm x 34mm). Cups were fixed on given area with the help of piston gun by creating a negative pressure (vacuum) inside the cup. 1 pump of air was removed from the cup initially to fix it on the area and after that according to participates feedback, more air was vacuumed with pump. participate was asked for any discomfort during the session. After 10 minutes the cup were removed and next session was done after one day.

FOR GROUP B

The group B consists of 15 patient who were treated with myofascial release technique with strengthening exercise. Treatment time – 30 minutes. Duration – 8 weeks (3 days in a week) Trapezius myofascial release

Deep transfer friction was given for 5 minutes followed by myofascial stretching of upper trapezius muscle for three times each holding for 90 seconds with the patient in comfortable sitting position on the armchair in both feet Both feet firmly planted on the floor gradual fiction was applied to the primary trigger point using the right thumb with the left thumb reinforcing it from the top then my official release was given to the upper trapezius with using ulnar border of both palm of the therapist at that time patient was in position of side flexion of cervical spine to opposite side.

Sternocleidomastoid muscle myofascial release: Deep transfer friction was given for 5 minutes followed by myofascial release of SCM muscle. Patient is in a comfortable supine lying position on the couch. Patient was in position of lateral rotation of cervical spine to opposite side. Deep frication was applied to the SCM using the thumb, start with a light touch and gradually increase the pressure as tolerated. The pressure should be firm but not painful.

STRENGTHENING EXERCISE (20 minutes)

1.Neck Isometric Exercise

Patient sits with the front and side mirror view to find a neutral balance position of lumbar and cervicothoracic spine. Cervical isometric exercise we are performed in the supine position while the chin tucked against a towel roll under the neck for 10 second, with 15 seconds break between holds, and 10 to 15 repetitions. and then isometric exercise where it performed with maximal effort in the seated position by resisting at the forehead towards cervical flexion, extension, lateral flexion, and rotation with the oneself hand as the same repetition and time as supine position.

Each patient was initiated at the sub maximal resistance to help him or her to adapt to isometric exercise and then was checked for progression until the maximum self-resistance the patient could tolerate was attained during every training session.

2.Deltoid strengthening: Lie against the wall with your back and elbows straight. Slowly lean your arms against the wall as tightly as you comfortably can, without pain. Hold for 5 seconds and repetition at 10 times on each side if it does not hurt.

3. Chin retracts exercise: Begin by keeping your neck and shoulders in a relaxed position. look straight ahead. Then slowly pull your chin back and bring your chin closer to your neck without holding your breath. You will feel some tension in the upper part of your neck. Also remember not to move your head up and down or bend your neck forward. Hold this position for 5 seconds. You can repeat this exercise 10 times a day.

4. Shoulder scaption: Scaption is the power of raising the arms away from the sides of the body and extending them forward at a 30-to-45-degree angle. Strengthening the scapula increases shoulder flexibility and reduces the risk of injury.

5. Shoulder shrug: Shoulder Shrug Increase strength by pulling shoulders into ears and hold for a few seconds, then allows dropping to rest position. You can also loosen the trap by turning your shoulders in both directions.

6. Diaphragmatic breathing: Sit comfortably in crook line. Place one hand on upper chest and the other below your rib cage. This help for diaphragm move as you breathe. Breath in slowly through your nose so that your stomach moves towards your hands in upward direction and while breath out hand move in downward direction.

**DATA ANALYSIS**

Changes in pre and post-test value of VAS & ROM were analysed to find out mean, std. div. , paired t- test, unpaired t-test and P value were kept <0.001 for significant.

Mean difference ± SD is used to signify all data.

Paired t-tests were performed to evaluate group differences before and after. P<0.05 was considered significant for two-tailed (alph-2) probability (p) values. Equipment used in the calculation are as follows:

Σχ n; mean

standard deviation SD = √ Σ(x-x1)/n-1 where x = data distribution value mean X

n = All samples independent t-test t = x1− x2

√(s1/n1+s2/n2)

**RESULTS**

After screening of the 35 patients for study eligibility, 30 patient were selected by exclusion & inclusion criteria and they were divided into 2 group -15 were in the Group A (cupping therapy with strengthening exercise) and 15 were in the Group B (myofascial release technique with strengthening exercise).

All the pre-test and post-test value of outcome measure were analysed and tubulised with interpretation.

Table 1: Age & gender wise distribution

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | **Age** |
|  | **N** | **GENDER** | **Mean** | **SD** |
| Group A | 15 | Male 9(60.00%)Female 6(40.00%) | 22.9 | 2.4 |
| Group B | 15 | Male 8(53.33%)Female7(46.67%) | 22.93 | 1.98 |

Table: 2 Intergroup Comparison of VAS

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **VAS** | **N** | **Mean** | **SD** | **S.E.M** | **Mean Diff.** | **DF** | **T****value** | **P****Value** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| VASGroup A | Pre | 15 | 7.47 | 0.92 | 0.24 | 4 | 14 | 15.2 | \* |
| Post | 15 | 3.47 | 0.64 | 0.17 |
| VASGroup B | Pre | 15 | 7.27 | 0.88 | 0.23 | 3 | 14 | 11.9 | \* |
| Post | 15 | 4.27 | 0.59 | 0.15 |
|  |  |  |  |  |  |  |  |  |  |

\*significant (P value <0.001)

INTERPRETATION: The above table & graph shows the analysis of pre & post-test value of VAS of both group (group A & group B). for group A- the mean of pre-test value of VAS was 7.47 & mean of post-test value of VAS was 3.47, the T value was 15.2 & P value <0.001. for group B - the mean of pre-test value of VAS was 7.27 & mean of post=test value of VAS was 4.27, the T value was 11.9 & P value <0.001 which was significant statistically.

Table-3: comparative analysis of Group A

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Flexion** | **N** | **Mean** | **SD** | **S.E.M** | **Mean Diff.** | **DF** | **T****value** | **P****value** |
| Flexion | Pre | 15 | 46.33 | 3.52 | 0.91 | -11.67 | 14 | -8.73 | \* |
| Post | 15 | 58.00 | 2.54 | 0.65 |
| Extension | Pre | 15 | 57.00 | 2.54 | 0.65 | 0.67 | 14 | 0.72 | \* |
| Post | 15 | 57.67 | 2.02 | 0.00 |
| Right LateralFlexion | Pre | 15 | 37.00 | 3.16 | 0.82 | -6.67 | 14 | -5.72 | \* |
| Post | 15 | 43.67 | 2.29 | 0.59 |
| Left Lateral Flexion | Pre | 15 | 38.00 | 3.16 | 0.82 | -5.67 | 14 | -4.86 | \* |
| Post | 15 | 43.67 | 2.29 | 0.59 |
| Right Rotation | Pre | 15 | 64.67 | 4.42 | 1.14 | -12.33 | 14 | -6.82 | \* |
| Post | 15 | 77.00 | 3.16 | 0.82 |
| Left Rotation | Pre | 15 | 65.00 | 5.35 | 1.38 | -14.00 | 14 | -81.40 | \* |
| Post | 15 | 79.00 | 2.07 | 0.53 |

\*significant (P value <0.001)

Table-4: comparative analysis of Group B

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Flexion** | **N** | **Mean** | **SD** | **S.E.M** | **Mean Diff.** | **DF** | **T****value** | **P value** |
| Flexion | Pre | 15 | 48.00 | 2.54 | 0.65 | -5.00 | 14 | -2.78 | \* |
| Post | 15 | 53.00 | 4.14 | 1.07 |
| Extension | Pre | 15 | 56.00 | 2.07 | 0.53 | 3.93 | 14 | 7.30 | \* |
| Post | 15 | 59.93 | 0.26 | 0.07 |
| Right LateralFlexion | Pre | 15 | 37.00 | 2.54 | 0.65 | -4.33 | 14 | -4.32 | \* |
| Post | 15 | 41.33 | 2.29 | 0.59 |
| Left Lateral Flexion | Pre | 15 | 38.00 | 2.54 | 0.65 | -3.33 | 14 | -3.32 | \* |
| Post | 15 | 41.33 | 2.29 | 0.59 |
| Right Rotation | Pre | 15 | 67.33 | 3.20 | 0.83 | -4.67 | 14 | -2.70 | \* |
| Post | 15 | 72.00 | 3.68 | 0.95 |
| Left Rotation | Pre | 15 | 69.00 | 3.38 | 0.87 | -6.67 | 14 | -6.18 | \* |
| Post | 15 | 75.67 | 1.76 | 0.45 |

\*significant (P value <0.001)

Table 5: Intergroup Group Comparison

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Post** | **Group** | **N** | **Mean** | **SD** | **S.E.M** | **Mean Diff.** | **T****value** | **P****value** |
| Flexion | A | 15 | 58.00 | 2.54 | 0.65 | 5.00 | 5.64 | <0.001 |
| B | 15 | 53.00 | 4.14 | 1.07 |
| Extension | A | 15 | 57.67 | 2.02 | 0.00 | 2.26 | 6.08 | <0.001 |
| B | 15 | 59.93 | 0.26 | 0.07 |
| Right LateralFlexion | A | 15 | 43.67 | 2.29 | 0.59 | 2.34 | 3.96 | <0.001 |
| B | 15 | 41.33 | 2.29 | 0.59 |
| LeftLateral Flexion | A | 15 | 43.67 | 2.29 | 0.59 | 2.34 | 3.96 | <0.001 |
| B | 15 | 41.33 | 2.29 | 0.59 |
| Right Rotation | A | 15 | 77.00 | 3.16 | 0.82 | 5.00 | 5.65 | <0.001 |
| B | 15 | 72.00 | 3.68 | 0.95 |
| Left Rotation | A | 15 | 79.00 | 2.07 | 0.53 | 3.33 | 6.71 | <0.001 |
| B | 15 | 75.67 | 1.76 | 0.45 |

**DISSCUSSION**

This study was designed to compare the effectiveness of cupping therapy and myofascial release with strengthening exercise in reducing pain and improving functional range of motion in collegiate student with non-specific neck pain. The purpose of study was to find out which of this intervention programme is more effective in reducing pain and improving functional range of motion in collegiate student with non-specific neck pain.

The study consists of 30 patients who were randomly assigned into two groups both the group underwent strengthening exercise then Group A cupping therapy and Group B myofascial release both the groups were assessed before and after the intervention to determine the extent to reduce pain and improving functional range of motion by using visual analogue scale and goniometer.

The present study showed that both myofascial release technique and the cupping therapy along with the strengthening exercise were give beneficial effect in the patient with non-specific neck pain. But there was significant difference between both group A and group B study and data calculation showed that cupping therapy with strengthening exercise improved ROM and VAS as more as compared to myofascial release technique.

The evidence supports the effectiveness of cupping for neck pain through a comprehensive systematic literature review. Cupping significantly reduced pain, and improved function and QOL.

Cupping may be an important and cost-effective therapy for the treatment of neck pain. For example performed a clinical trial on home-based cupping. Due to the increased use of computers and smartphones around the world, the prevalence of neck pain is rising steadily, and this type of pain can often develop into chronic pain. Thus, this study is meaningful in that it evaluates a non-invasive, simple, and effective treatment modality for patients with chronic pain.

**CONCLUSION**: The result of this study concluded that after 8 weeks of intervention both myofascial release & cupping therapy were significantly effective for improving functional range of motion and reducing pain in collegiate student with non-specific neck pain. However, cupping therapy was more effective then myofascial release in non-specific neck pain.

**LIMITATION:** No follow up examination, only two types of interventions take & compare. Only collegiate student were taken for this study. Limited age group of subjects were included.

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