



## EFFECTIVENESS OF INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION (IASTM) AND CUPPING THERAPY ON NON SPECIFIC NECK PAIN WITH MOBILITY DEFICIT IN DESK JOB PROFESSIONALS

### Physiotherapy

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### ABSTRACT

**Background:** There is limited evidence available which support that Instrument assisted Mobilization (IASTM) and Cupping Therapy can be used as an intervention in the management of mechanical Neck Pain.

**Study Design:** experimental study design & 20 to 50 years of age, both male and female.

**Methods:** Patients diagnosed in Desk Job Professionals With non-Specific Neck Pain and mobility deficit underwent a standard evaluation including the Neck disability Index (NDI), and active Neck range of motion (ANROM). 100 patients were randomly divided in two groups, to be treated with either Conventional therapy or Cupping and IASTM tool approach. Outcomes of treatment were captured on the before treatment 1<sup>st</sup> day and after 6<sup>th</sup> week of the treatment session.

**Results:** The data was analyzed using sample 't' test In this study after administration of exercises, the Neck Disability index of Desk job Professionals of both the groups, A and B were improved. But, Better Disability index experienced by Desk job Professionals of group A than Desk Job Professionals of group B. Overall, the pain status was found to be different after administration of exercises in groups. At post intervention, the mean difference in Neck Disability index among Desk job Professionals between group A and group B were statistically highly significant ( $p < 0.001$ ).

**Conclusion:** In this study the result showed that the Desk job Professionals intervened with Instrument-Assisted Soft Tissue Mobilization (IASTM) and Cupping Therapy with conservative treatment is better and more improved in angles of neck flexion and extension, lateral rotation, bending at right and left sides and neck disability index, than Desk job Professionals treated with conservative treatment alone.

### KEYWORDS

IASTM, Cupping Therapy, desk job Professionals, NDI, nonspecific neck pain

### INTRODUCTION

Neck pain is a very common problem that can negatively affect the patient's quality of life, and may result in medical consumption, absenteeism, and disability. A neck pain that lasts more than 3 months is defined as chronic [1]. Neck pain is second only to low back pain in frequency [2]. About 67% of all individuals suffered neck pain at some stage of their life which resolved within 1 month. However, the prevalence of chronic neck pain (CNP) approaches 14% [3].

Pain is categorized by its duration, as acute when lasting up to 6 weeks, sub-acute when lasting from 6 weeks to 3 months and chronic when lasting for more than 3 months. It is estimated that 22% to 70% of the population are likely to have neck pain during their lifetime [4-6].

Sitting at desk hunched over computer keyboard can be a major cause of neck pain and neck problems. When combined with the fact that many people with desk jobs spend most of their time sitting without moving for hours at a time, it's no surprise that desk jobs are associated with increased instances of neck pain [7]. By implementing a few self-help techniques, may be able to reduce neck pain, improve mobility in cervical spine and prevent the development of certain neck problems [8].

Manual therapy has a variety of procedures directed to the musculoskeletal structures for the treatment of mechanical pain. It includes soft tissue therapies, such as the many types of massage, focal soft tissue therapy, such as trigger point therapy, shiatsu, acupressure, mobilization, manipulation, and manual traction [9-10].

IASTM: In the mid-1990s, **David Graston**. IASTM is instrument-assisted soft tissue mobilization. It is another type of manual therapy that combines different ergonomic tools that are used to softly massage and scrape portions of the skin. These stainless steel tools are used to treat heal injuries or condition of soft tissues, such as sprains, strains. After treatment, the affected area will be stretched and therapist will provide subject to ice packs if he experience any soreness.

Cupping therapy is an antique alternate medicine, which dates to the ancient Egyptian, Chinese, and Middle Eastern empires. Allowing to traditional Chinese medicine, it is thought that cupping therapy aids to

remove blockages in the energy tracks and eradicate imbalances in the physique by stimulating the able flow of energetic energy within its paths [11-12]

### METHODOLOGY

The study design was experimental study and different subject design. It was conducted in the Out-patient Department of Physiotherapy, Sri Aurobindo Institute of Medical Sciences, Indore, Department of Physiotherapy, IIMS Indore & Department of Physiotherapy, and BHRC Indore in January 2021 to December 2021. 100 subjects who fulfilled the inclusion and exclusion criteria were equally divided into two groups by random sampling method. Subjects suffering from non-Specific Neck Pain and mobility deficit were available for the study and later divided into two equal halves of size 50 that constituted into two groups and further designated as "group A" and "group B". The patients with nonspecific Neck Pain and mobility deficit in group A received IASTM and Cupping therapy along with Conservative physiotherapy treatment while rest of other patients of group B received Conservative physiotherapy treatment only. The patients assessed by NDI scale and AROM analysis at baseline and were treated for 6 weeks and reassessed by the same. NDI scales have been shown to be reliable and valid [13].

### INCLUSION CRITERIA:

1. Desk job professionals with Non-Specific neck pain lasting more than 3 months.
2. Hypo-mobility of the cervical range of motion.
3. Age group 20-50 year of age, both sex groups male and female.
4. Non disco genic Non Specific neck pain and neck stiffness.
5. No physiotherapy treatment taken from last 6 months.

### EXCLUSION CRITERIA:

1. Any contra indication to spinal mobilization. (SM) such as inflammation, infection, congenital malformation, trauma and cerebrovascular abnormalities.
2. Radiating pain to shoulder and upper limbs.
3. Trauma or tumor around the neck.
4. Prior surgery to cervical and upper thoracic spine.
5. Any neurological signs.

**Group “A” (Experimental group):** subjects were treated with Conventional Along with IASTM and Cupping Therapy

1. Moist heat pack for 10 min.
2. *Stretching of Cervical and Upper Quadrant Muscles (4 to 5 repetitions with 15-30 second hold).*
3. Dynamic isometric exercise using resistance band (4 to 5 sets of 10-15 repetitions).
4. Postural advice
5. Cupping Therapy
6. IASTM

**IASTM:** The treatment will be performed using two pieces of Instrument Assisted Soft Tissue Mobilization (IASTM) stainless steel in the neck, bilaterally, which comprise the following muscles: Upper Trapezius, Splenius, scalenes and Sternocleidomastoid. A recognized time of 3 minutes will be used in each area, using an angle of 30 to 60° with the tool. As it is observed, through the instrument, areas of greater adhesion, the researcher will use most of this time to release this area. (14)

**Cupping Therapy:**

Cups were applied during the cupping intervention. We used cup dimensions with inner diameters of 3.56 cm (1.4 in) and 4.57 cm (1.8 in). The size of the cup used rest on on the size of the treatment area, which varied among participants. For case example, we used a cup with a 3.56-cm inner width for all treatments from the base of the skull to C7. We used a cup with a 4.57-cm inner diameter for any treatments below C7 to the superior angle of the scapula to put up the larger upper trapezius. Applied the cup to the Subject skin directly over the site of greatest increased sensitivity and Total of 3 suction pumps were drawn from the cup to secure it to the skin. If the cup lost its suction effect or was on the loose from the skin before the treatment was completed, the examiner promptly reapplied the cup using 3 more pumps. The cupping therapy for 8 -10 minutes and then was removed by pulling on the release valve. Given that no identical treatment time exists for dry cupping therapy, this time frame was used based on our clinical expertise.

**Group B (Conventional therapy):** subjects were treated with

1. Moist heat pack for 10 min.
2. Stretching of Cervical and Upper Quadrant Muscles (4 to 5 repetitions with 15-30 second hold).
3. Dynamic isometric exercise using resistance band (4 to 5 sets of 10-15 repetitions).
4. Postural advice



**1 Dynamic Isometrics Exercise Using Resistance band**

**Table1. Comparison of angles of neck flexion and extension, and neck disability index between baseline and post intervention in group A and group B.**

Parameter		Sampling Stage	Scatter	Mean Diff	t- statistic	LOS		
		Mean ±SD						
Group B (Experimental)	Flexion (degree)	Baseline	38.02±4.64	7.56 degree	12.2	*p=0.000		
		Post Intervention	45.58±2.83					
	Extension (degree)	Baseline	48.68±4.16	6.78 degree				
		Post Intervention	55.46±2.76					
	Neck Disability Index (%)	Baseline	53.54±3.89	33.86 %			43.65	*p=0.000
		Post Intervention	19.68±3.67					

Flexion (degree)	Baseline	37.98±4.45	11.04 degree	18.2	*p=0.000
	Post Intervention	49.02±1.45			
Extension (degree)	Baseline	48.58±4.14	10.34 degree	16.37	*p=0.000
	Post Intervention	58.92±2.04			
Neck Disability Index (%)	Baseline	52.72±4.51	40.60%	67.74	*p=0.000
	Post Intervention	12.12±2.57			

**Table 2: Measurement of Change in Right and Left Sides Angle of Lateral Rotation and Bending Between Baseline and Post Intervention in Groups (A and B).**

Parameter		Sampling Stage	Scatter Mean ±SD	Mean Diff	t- statistic	LOS		
Group B (Conventional)	Right Side Lateral Rotation	Baseline	70.20±4.01	7.14 degree	12.77	*p=0.000		
		Post Intervention	77.34±1.44					
	Left Side Lateral Rotation	Baseline	70.02±2.54	6.92 degree				
		Post Intervention	76.94±1.58					
	Right Side Bending	Baseline	35.76±2.91	6.18 degree			14.69	*p=0.000
		Post Intervention	41.94±1.25					
Left Side Bending	Baseline	36.42±2.38	5.98 degree					
	Post Intervention	42.40±1.26						
Group A (Experimental)	Right Side Lateral Rotation	Baseline	69.02±3.38	10.24 degree	23.16	*p=0.000		
		Post Intervention	79.26±2.83					
	Left Side Lateral Rotation	Baseline	69.50±3.56	9.74 degree				
		Post Intervention	79.24±2.96					
	Right Side Bending	Baseline	34.96±2.67	8.58 degree			20.52	*p=0.000
		Post Intervention	43.54±1.50					
Left Side Bending	Baseline	35.76±2.36	8.26 degree					
	Post Intervention	44.02±1.64						

In this study after administration of exercises, the Neck Disability index of Desk job Professionals of both the groups, A and B were improved. But, Group A received IASTM and Cupping Better Disability index experienced by Desk job Professionals of group A than Desk job Professionals of group B. Overall, the pain status was found to be different after administration of exercises in groups. At post intervention, the mean difference in angles of flexion and extension and Neck Disability index among Desk job Professionals between group A and group B were statistically highly significant (p<0.001).

Among Desk job Professionals of group B, the average neck disability index (19.68±3.67 %) found to be significantly reduced at post administration as compared to average neck disability index (53.54± 3.89 %) at baseline sampling stage. These mean difference of 33.86% in disability index between baseline and post administration among Desk job Professionals of group B were statistically strongly significant (p=0.00)

Among Desk job Professionals of group A, Average (Mean ± Standard deviation) neck disability index (12.12±2.57 %) among Desk job Professionals of group A found to be significantly reduced at post sampling stage as compared to average neck disability index (52.72±4.51 %) at baseline sampling stage. These mean difference in disability index (40.60 %) between baseline and post administration among subjects of group A were statistically highly significant (p=0.000).

**DISCUSSION**

This study is to find out the in effectiveness of IASTM and Cupping Therapy in Desk job Professionals with Non Specific Neck Pain with Mobility Deficit. IASTM Cupping therapy decreased levels of perceived pain and disability associated with non-specific neck pain and increased localized blood flow of the treated tissues compared with Conventional group. For subjective Range of neck and pain intensity ,

individuals treated with IASTM, cupping experienced decreased perceived pain immediately after the treatment compared with those in the and control groups. Included multiple treatment sessions, different cupping locations, or a different version of cupping therapy (i.e., wet cupping), limiting the comparisons.

During IASTM and cupping therapy, mechanically increasing tensile stresses via negative pressure inside the cup is believed to cause traumatic dilation of superficial capillaries, leading to rupture of these vessels and eventual ecchymosis.<sup>15,16</sup> The extravasation of erythrocytes and nutrients from the surrounding blood vessels during dry cupping therapy has been suggested to initiate the acute inflammatory response.<sup>17</sup> The process to repair damaged tissue takes place in 3 overlapping stages: the inflammatory phase, fibroblastic-repair phase, and maturation-remodeling phase.<sup>17</sup> Immediately after a musculoskeletal injury, the inflammatory phase begins with vasodilation, which allows oxygenated blood and various inflammatory cells to invade the damaged tissues.<sup>17</sup> The release of histamine and other inflammatory chemicals to the injured area increases capillary permeability and permits an influx of neutrophils, macrophages, and plasma proteins. Flooding the damaged area with blood, inflammatory cells, and nutrients is necessary for tissue healing and is also a theorized benefit of cupping therapy.<sup>17,18</sup>

The IASTM treatment had an immediate clinically and statistically significant sustained effect in reducing cervical pain and increasing extension range of motion. Several systematic reviews since 1996 to present have reported that soft tissue mobilization is little known for its efficacy in patients with neck pain, the studies also show that it probably provides short term benefits for some patients with mechanical neck pain. Studies have been done by giving ergonomic advice combined with stretching and strengthening exercise has shown that they can reduce pain and increase functional activities [19]. Cupping and IASTM is An isolated increase in oxygenated hemoglobin levels may support the theory that dry cupping therapy helps to supply the treated tissues with fresh blood to promote healing and reduce pain.<sup>20,21,22</sup> No changes were noted for deoxygenated hemoglobin levels, thus further supporting the claim that dry cupping therapy elevates oxygen-rich blood levels in the treated tissues. We theorize that, because participants were in a consistent, relaxed state, the treated tissues had no increased need for oxygen expenditure; therefore, the deoxygenated levels remained constant. However, this theory is not yet supported.

**Limitation & future recommendation:** Present study had a few limitations, like; the sample study was small, future researches can be based upon a relatively larger sample that is more representative of the population. Another limitation of present study was short term effect of SNAG Mobilization was assessed, i.e., long term effect can be assessed. All measurements were taken manually and this may introduce human error which could affect the reliability of the study. NDI are subjective assessment tool, so there might be some errors while filling the scores by patient themselves. Further study can be done on patients with cervicogenic headache associated neck pain or radiating neck pain in computer professional with mobility deficit.

## CONCLUSION

In conclusion, this experimental study was performed on 100 subject and 50 subjects in each group with complaints of Non Specific Neck Pain with Mobility Deficit with conventional physiotherapy. The group treated with Conventional along with IASTM and Cupping Therapy had significant improvement in ROM of cervical joint, pain and disability due to Non Specific Neck Pain with Mobility Deficit than those treated with conventional physiotherapy alone.

**Conflicts of interest: None**

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