

Immediate effect of Maitland Mobilization versus Muscle Energy Technique on Non-specific neck pain associated with forward head posture in auto drivers

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Abstract-

Objective: Immediate effect of Maitland Mobilization versus Muscle Energy Technique on non-specific neck pain associated with forward head posture in auto drivers.

Design: Simple Random Sampling.

Methodology: A total 45 patients were included as per pre-define inclusion and exclusion criteria and randomly assigned into two groups each having 20 patients. Group A was given Maitland Mobilization (Anteroposterior and Posteroanterior Glide) while Group B was given Muscle Energy Technique (Sub occipital Muscle Release) for once. The patient's outcome measures were assessed by visual analog scale and measurement of craniocervical angle with ON Protractor smartphone application. Pre and Post treatment values were recorded for comparison of results. **Results:** Results revealed that means and S.D of both group were clinically significant but statically the group of the patients treated with Group A MM managed pain CVA (pre= 45.66 ± 3.72 , post= 45.66 ± 3.72), VAS (pre= 6.75 ± 1.29 , post= 2.45 ± 1.92) is better than group B of patient treated with Muscle Energy Technique in terms of pain. On CVA (pre= 47.09 ± 1.66 , post= 49.48 ± 1.44) on VAS (pre= 6.4 ± 1.31 , post= 4.7 ± 1.21).

Conclusion: The result of study suggest that both the Maitland Mobilization and Muscle Energy Technique improves the symptoms of neck pain. Better improvement was shown by Maitland Mobilization group than Muscle Energy Technique group. Based on these results Maitland mobilization should be the treatment choice for non-specific neck pain associated with forward head posture.

Keywords: Non- specific neck pain, Forward head posture, Maitland Mobilization, Muscle energy technique.

INTRODUCTION

Pain can be defined as an "unhappy sad, emotional feeling associated with current experience of potential tissue damage and depicted in terms of such damage"¹. Neck pain is the major problem that occurs in 66% population during their lifetime. Neck pain is most common musculoskeletal problems seen in day to day life due to the ergonomical changes seen in majority of population and neck pain can also cause by the stress over the musculoskeletal system because of bad postural habits.² The majority of neck pain is not due to the pathology and thus has been said to be non-specific or mechanical neck pain. It is most common issue which has more impact on various types of population in parts of health, work and economy that plays important role for the productivity of the work as well as the physical health of the person working in the different aspects of the job sectors.³ According to Rajsh Gautam et.al, prevalence of neck pain is 13% and the lifetime prevalence can be 50% where neck pain is very common problem in our surrounding and, at any time, also affect the general population.⁴

Estimate the prevalence of chronic neck pain vary. Each year 27% to 48% of worker suffers Non-specific neck pain. Non-specific neck pain can usually resolve for or within days but can reoccur or become chronic.⁵ Non-specific neck pain (NP) is defined as pain in the posterior aspect of the neck between the superior nuchal line & the spinous process of first thoracic vertebra with no sign and symptoms of major structural pathology or minor interference with the absence of neurological signs and specific pathologies such as; fracture, infectious or cervical spondylosis, any trauma and post-operative history.⁶ This nonspecific neck pain is responsible for significant loss of productivity.⁷

Faulty Work posture leads to psychosocial variables it may include inter-personal relationship at work, which can cause mental stress and physical stress which ultimately gives rise to the musculoskeletal disorders in the working populations. Poor posture might result in muscle imbalance, this causes faulty relationship in cervical spine. High rates of work related neck pain has been reported during occupation and it causes pain in the neck, tension headaches, alteration in normal curvature of cervical spine like flat cervical spine, forward head posture(FHP).⁸

Optimal neck posture is important to lessen to need of muscular activity and the stress apply on cervical tissue.⁹ Bad posture like forward head posture know as bump of head in the saggital plane so the head is anterior to the trunk by the alignment.⁹ This kind of changes can occur due to anterior translation of upper cervical vertebrae and also associated with the increase in upper cervical extension.¹⁰ This malalignment of structure suggest to increase load on the posterior elements, affect the length tension relationship in the cervical spine muscle. Forward head posture is the hyper extension of upper cervical spine, poor posture of C1 and C2 vertebrae that causes weakness of the posterior cervical muscles (sub occipital splenis, semispinalis) and it has association with

increased kyphosis in thoracic spine, increased lordosis of lumbar spine i.e hyperlordosis which can cause pain in thoracic region and low back pain as well.¹¹

One of the limitation of manual measurement technique is that the physician used to use both hands for examination in case of maintaining the stability of the limb is too difficult and can lead to problem such as error or difference in the reading.¹² there are various software used for measuring the craniovertebral angle^{13, 14} mostly used is ON Protractor app with good reliability and validity. Three markers were used: one placed on C7, the second placed on tragus of ear and the third on the canthus. The angle between the line joining C7 to tragus and vertical line extending from C7 was measured.¹⁵

Sitting cause trunk flexion, which increase muscle stiffness as well as mechanical load which is applied over the spine.^{16, 17}Recent findings published by the US Bureau of labor statistics in 2017 shows that bus or any kind of drivers like auto, truck and bike are of one top three occupation shows the highest rate of musculoskeletal disorder.¹⁸main cause of the neck pain reported in drivers is due to habitual forward head posture during or along the time of driving for longer duration, invariable jolting and the important is driving seat ergonomics. Other cause are improper driving posture, rapid excessive work load of driving and tension in the muscle of neck. Those who drive for prolong period of the time and the durations are more prone to neck and shoulder pain if not maintain the proper posture. 60% to 69% of driver suffer from it.¹⁹

Prolonged sitting and repetitive muscular efforts to perform various occupational task such as steering, changing gears, and applying breaks continuously and repeatedly.²⁰

Thus, bus drivers, car drivers, auto drivers, population who drives vehicle on daily basis are more prone for the neck pain as well as the forward head posture as they drive for longer shift for hours.²¹

Interventions like Maitland Mobilization (MM) are passive skilled manual technique used mainly to reduce pain and to improve movement. This technique is helpful to reduce pain and increase range of motion with applying grades, and it is widely used by therapists across the world. In this technique oscillations are given to the affected area in order to reduce the symptoms.²²

Muscle Energy Technique (MET) is the manual technique used mainly by the clinician to improve the range and muscle strength. In MET physiotherapist does not control corrective force, the patient uses voluntary contraction of various intensities.²³This technique can solve muscle contractures or weakness of the muscle. Patient utilizes his voluntary muscle power for Post Isometric relaxation with resistance offered by the therapist. This technique commonly used by the clinicians to improve muscle power and movement at the joint segments and it improves the range of motion at the joint by finding the new barrier.²⁴

There was a study conducted to determine the effect of muscle energy technique in the management of non-specific neck pain in the biomechanical aspect by observing the effect on forward head posture including neck pain, disability.

NEED FOR THE STUDY

Neck pain might be the most common symptom now a days. As we can see many auto drivers around us complaints about the neck pain due to the work of driving the auto continuously and on regular basis which can lead to the pain in cervical region.

Pain felt by the auto drivers in the cervical area affect their work of driving where they cannot drive the auto for the longer duration which might affect their socioeconomical status which indirectly affect overall lifestyle of an individual socially, mentally and physically.

Improper driving posture, rapid excessive work load of driving and tension in the muscle of neck. Those who drive for prolong period of the time and the durations are more prone to neck and shoulder pain if not maintain the proper posture. Prolonged sitting and repetitive muscular efforts to perform various occupational task such as steering. Auto drivers, population who drives vehicle on daily basis are more prone for the neck pain as well as the forward head posture as they drive for longer shift for hours.

Muscular pain is an important aspect of normal human function. Poor posture predispose a person to several musculoskeletal overuse injury and it affects the person's level of functions to enhance the range of motion and abnormal posture from a healthy perspective. Technique like Maitland mobilization can be used to treat participants with Nonspecific neck pain. Also the technique used for the forward head posture.

Another technique like Muscle Energy Technique is used for the reduction of neck pain and there are few studies which have that there is an significant difference in reduction of pain and correction of the forward head posture but there are hardly few studies comparing effect of Maitland Mobilization and Muscle Energy Technique. Due to lack of literature compared between this two technique

Hence, there is a need to study comparison of the immediate Maitland Mobilization and Muscle Energy Technique in the patients of non-specific neck pain associated with forward head posture in auto drivers.

AIM:

- To find out the immediate effect of Maitland Mobilization versus Muscle Energy Technique on non-specific neck pain associated with forward head posture in auto drivers.

OBJECTIVE:

- To study the immediate effect of Maitland Mobilization on non-specific neck pain associated with forward head posture.
- To study the immediate effect of Muscle Energy Technique on non-specific neck pain associated with forward head posture
- To study the comparison of immediate effect of Maitland Mobilization versus Muscle Energy Technique on non-specific neck pain associated with forward head posture.

Research Question:

- What will be the difference between immediate effect of Maitland Mobilization and Muscle Energy Technique on Non-specific neck pain associated with forward head posture in auto drivers by using Craniovertebral angle and visual analog scale.

OPERATIONAL DEFINITION

Non-specific neck pain can be considered in those individuals those with no significant history of any trauma to the cervical spine, cervical spine fracture, and post-operative case of cervical fracture, whiplash injury, vertebral artery insufficiency and recent surgery.

MATERIAL AND METHODOLOGY

- **Source of Data:** auto drivers association registered in and around city
- **Type of Data:** Quantitative
- **Study Design:** Comparative Study
- **Sample size:** Sample size for the study will be 45
- **Sample population:** Auto Drivers with nonspecific neck pain associated with Forward Head Posture
- **Sampling Method:** Simple Random Sampling
- **Study Duration:** 6 month

Inclusion criteria:

- Age – above 30
- Male and female
- Auto drivers with non-specific neck pain Associated with forward head posture.
- Craniovertebral angle less than 50 degree
- Driving for 6-7 hours/day.

Exclusion criteria:

- Any traumatic injury to cervical
- Fracture to cervical
- Any pathological conditions of cervical
- Recent surgery
- History of whiplash injury
- Vertebral artery insufficiency

HYPOTHESIS

Null Hypothesis (H_0):

- There will be no significant difference in pain and craniovertebral angle in 45 participants with non-specific neck pain associated with forward head posture when treated with Maitland Mobilization and Muscle Energy Technique.

Alternative Hypothesis (H_1):

- There will be significant difference in in pain and craniovertebral angle in 45 participants with non-specific neck pain associated with forward head posture when treated with Maitland Mobilization and Muscle Energy Technique.

OUTCOME MEASURES

Outcome measures used for this study will be as follows

1. Visual analog scale:

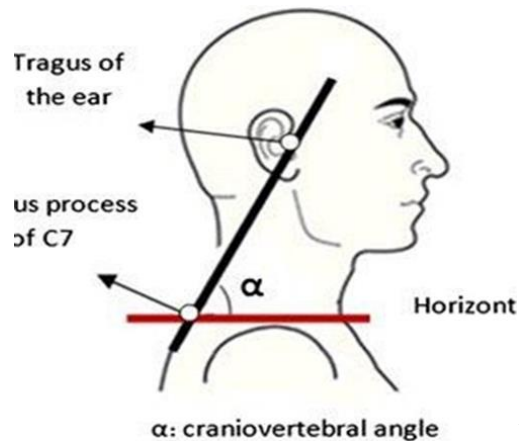
A VAS consists of a line, often 10 cm long, with verbal anchors at either end, similar to an NPRS (e.g., “no pain” on the far left and “the most intense pain imaginable” on the far right). The patient places a mark or shows accordingly at a point on the line corresponding to the patient’s rating of pain intensity. The line may be depicted with a horizontal or vertical orientation or any kind of other shape.



2. Craniovertebral angle measurement:

Craniovertebral angle is measured by using the ON Protractor smartphone application **taking lateral view of the subject in a relaxed seated position without a back support. The Spinous process of C7 and tragus of ear** are marked or line of angle is creating. A horizontal line which is drawn from passing through C7 which make a right angle with the vertical line. Degree of

angle is measured for the assessment of the forward head posture. Less than 50 degree it is usually consider as (FHP)



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PROCEDURE AND INTERVENTION

- All the participants were screened and according to the inclusion and exclusion criteria they were divided
- The informed written consent is obtained from the participants regarding the procedure prior to the study.
- All the participants were undergo Visual analog scale (VAS) for neck pain and measurement of craniocervical angle with ON Protractor smart phone app for forward head posture.
- All the participants were divided into two groups. Group A and Group B.
- Pre and post intervention of visual analog scale and craniocervical angle is measured for the pain and forward head posture.
- Group A treated with Maitland Mobilization anteroposterior glide (AP Glide) and Posteroanterior Glide (PA Glide).
- Group B treated with Muscle Energy Technique at cervical spine.



Group A: will be treated with Maitland Mobilization antero-posterior glide and postero-anterior glide.

- **Procedure : Posteroanterior glide (PA)**

Position of patient: Ask the patient to get in prone lying forehead resting on hand in comfortable position.

Position of therapist: Beside the patient in walk standing position.

Hand placement and technique: Palpate the spinous process of cervical vertebra Place the pulp of the thumb on spinous process and give grade 1 of, Maitland Mobilization glide in Posteroanterior direction 10 to 15 repetition from C3 to C6 in 3 sets. For C7 with the pisiform bone where 10 to 15 repetition in 3 set and rest for 1 min after each set. (25,26,27)



Procedure: Anteroposterior glide (APG)

Position of patient: patient is in supine lying position head out of the table

Position of therapist: beside the patient at the edge of the treatment table.

Hand placement and technique:

Place the web space of the proximal hand on the mandible for providing the force into the Anteroposterior direction for glide. While ask patient to chin tuck. Another hand placed at the occiput to grasp the head of the patient providing the distraction at cervical then apply force from anterior to posterior direction 10 to 15 repetition from C1 and C2 in 3 sets and rest for 1 min in between each set. (28, 29, 30)



Group B will be treated with Muscle Energy Technique at cervical spine – (Sub-occipital Muscle Energy Technique)

• **Procedure:**

Position of patient: patient will be taken in supine lying comfortable position

Position of therapist: Therapist placed her one hand on the occiput and other on to forehead and the barrier of restriction of Suboccipital Muscle was identified.

subject was instructed to perform an isometric contraction of sub-occipital muscle by saying tuck your chin upwards opposite to the resistance which is applied by therapist shoulder of opposite side.

Force applied by the subject against therapist resistance was mild to moderate.

The above contraction was held for 10 second followed by 5 second rest period (voluntary relaxation).

Ask the Subject to inhale which was followed by exhalation and along with the exhalation phase apply stretching of sub occipital muscle which was performed by the therapist which was hold for 30 second.

The muscle was again taken into the new barrier and same above process was repeated 3 times with 10 second contraction followed by 30 second hold (31,32).

DATA ANALYSIS AND INTERPRETATION

• The study was conducted to find out the immediate effect of Maitland Mobilization and Muscle Energy Technique in participants with Non- specific neck pain associated with forward head posture in auto drivers. The results were analyzed on the basis of data obtained from pre-intervention and post-intervention using a ON Protractor smartphone application for measuring the forward head posture or craniovertebral angle and neck pain by using VAS. The analysis was done using GraphPad InStat. A paired t-test (for quantitative data to compare before and after intervention in each group) and the unpaired t-test (for quantitative data between two groups) were used for comparison of group. Level of the significances is set at- ($p \leq 0.001$.)

STATISTICAL ANALYSIS AND INTERPRETATION

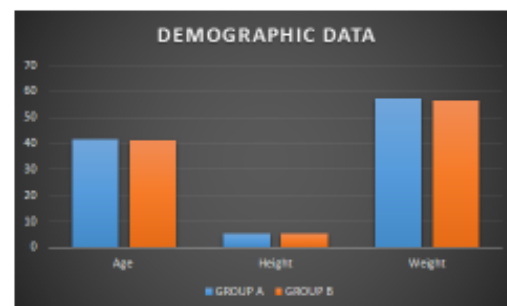
Demographics:

• A total of sixty- seven participants were screened from November 2022 to March 2023, of which forty-five participants met the inclusion criteria. Out of these forty participants agreed to participate in the study. The participants were divided into two groups Group A include twenty participants and Group B include twenty participants. The groups were named as Group Maitland Mobilization, Group B- Muscle Energy Technique.

• The mean age of participants in Group A was 41.7 ± 9.92 years, in Group B was 41.2 ± 6.8 years. The mean weight of participants in Group A was 57.45 ± 11.2 kilograms and in Group B 56.74 ± 6.88 kilograms. The mean height of participants in Group A was 5.29 ± 0.38 cm and in Group B 5.3 ± 0.27 inch. Both groups were similar in their baseline demographic data

Baseline demographic graph among group A and B

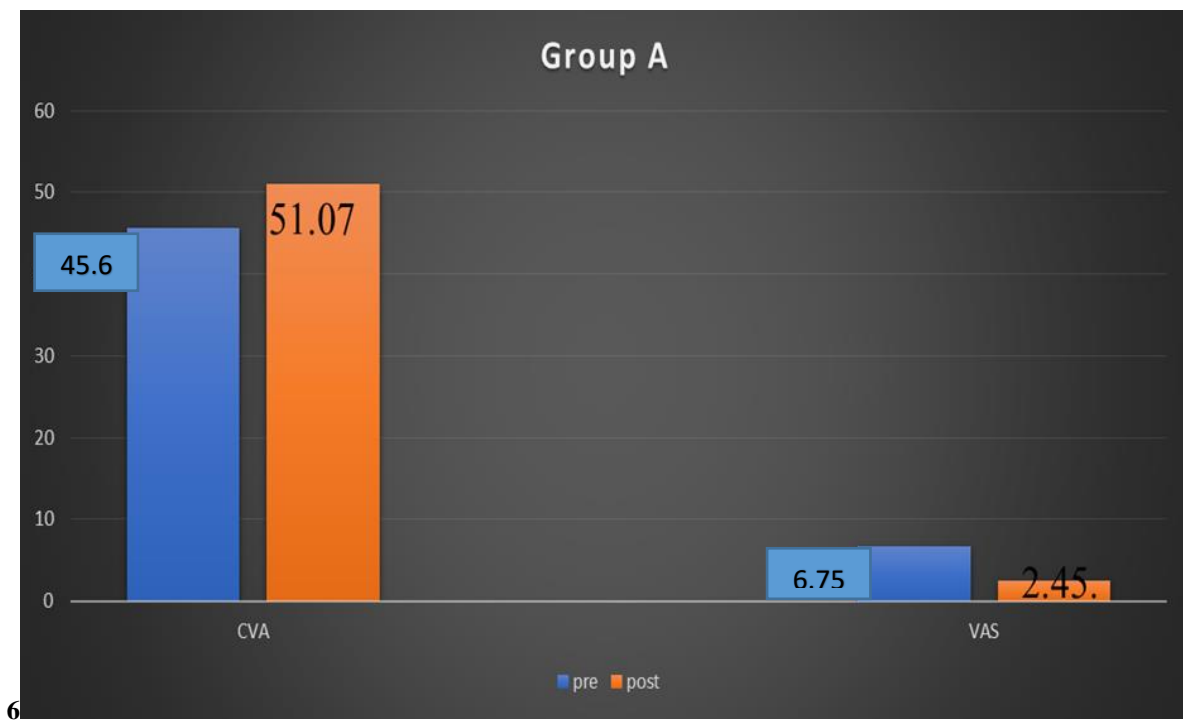
Demographic Characteristics	Group A	Group B
Age (years)	41.7 ± 9.92	41.2 ± 6.83
Height (cm)	5.29 ± 0.38	5.3 ± 0.27
Weight (Kg)	57.45 ± 11.2	56.74 ± 6.88



Group A:

In group A 20 participants were included, intervention given for them was Maitland Mobilization and outcome measures taken were Craniovertebral angle measurement and visual analog scale. On comparing within group A the Craniovertebral angle showed a marked increase in the range of CVA with 19 degrees of freedom, ($p < 0.0001$, $t = -6$), Visual Analogue Scale also showed a reduction in intensity of pain in Non-specific neck pain with 19 degrees of freedom, ($p < 0.0001$, $t = 10$). It suggests that there was a significant difference in both the outcomes. (Table)

Group	Outcome Measures	Pre-Intervention	Post Intervention	t value	p value	Interference
Group A	Craniovertebral angle (CVA)	45.66 ± 3.72	51.07 ± 2.23	-6	$p < 0.0001$	Highly Significant
	Visual Analog Scale (VAS)	6.75 ± 1.29	2.45 ± 1.92	10	$p < 0.0001$	Highly Significant



Graph: Comparison of mean score of CVA and VAS within Group A

This above graph shows a comparison of the mean score of craniovertebral angle and visual analogue scale within-group A. The above graph shows there was a marked increase in the craniovertebral angle with an increase in mean value 45.66 degree to 51.07 degree. Also, the visual analog scale showed a marked decrease in neck pain with the decrease in the mean value of 6.75 to 2.45. Both outcome measure showed a marked significant differences in the mean score values after the intervention of Maitland Mobilization

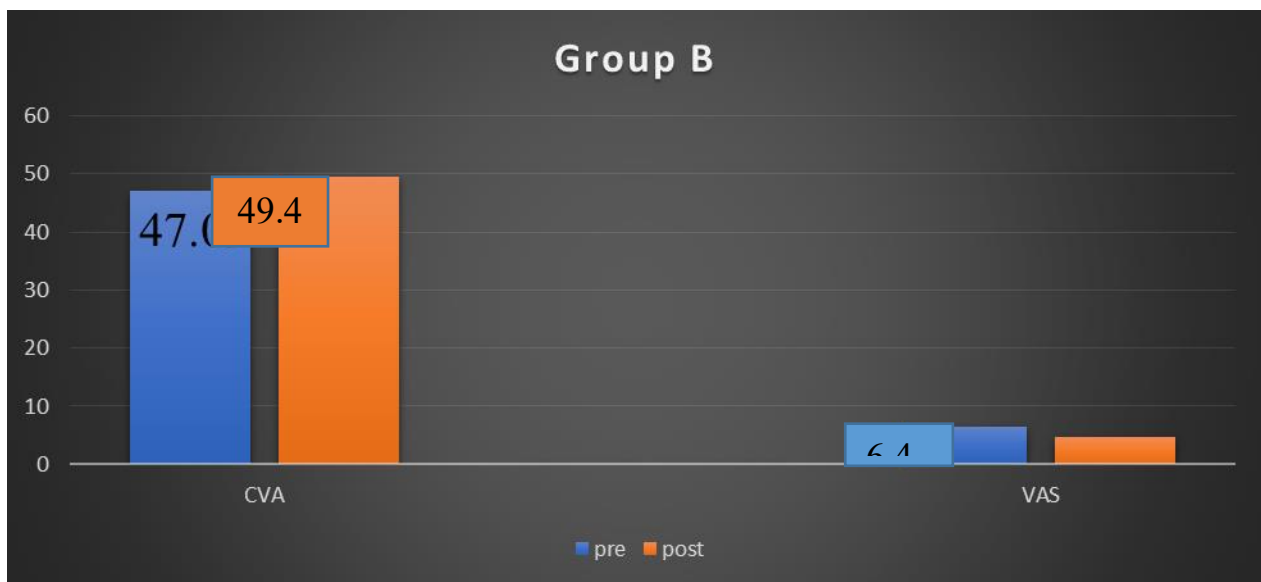
Group B:

In group B 20 participants were included, intervention given for them was Muscle Energy Technique and outcome measures taken were CVA and VAS. Cranio-vertebral angle was measured using a ON Protractor smart phone application. Pain intensity was carried out with the Visual Analogue Scale. On comparing within the group B, the CVA showed an increase in the range of angle with 19 degrees of freedom, ($p < 0.0001$, $t = -6.93$), VAS also showed a decrease in pain intensity with 19 degrees of freedom, ($p < 0.0001$, $t = 16.17$). It suggests that there was a significant difference in both the outcome measures in group B. (Table)

: Comparison of mean score of CVA and VAS within group B

Statistical Test used: Paired t test

Group	Outcome Measures	Pre-Intervention	Post Intervention	t value	p value	Interference
Group B	CVA (degree)	47.09 ± 1.66	49.48 ± 1.44	-6.93	$p < 0.001$	Highly Significant
	VAS	6.4 ± 1.31	4.7 ± 1.21	16.17	$p < 0.0001$	Highly Significant



Graph: Comparison of mean score of CVA and VAS within Group B.

This above graph shows a comparison of the mean score of Craniovertebral Angle and Visual Analog Scale within Group B. The above graph shows, increase in the degree of CVA mean value from 47.09 degrees to 49.48 degrees. As well as graph shows reduction in the pain intensity mean value from 6.4 to 4.7.

Both the outcomes shows significant difference in the mean value after the intervention of Muscle Energy Technique

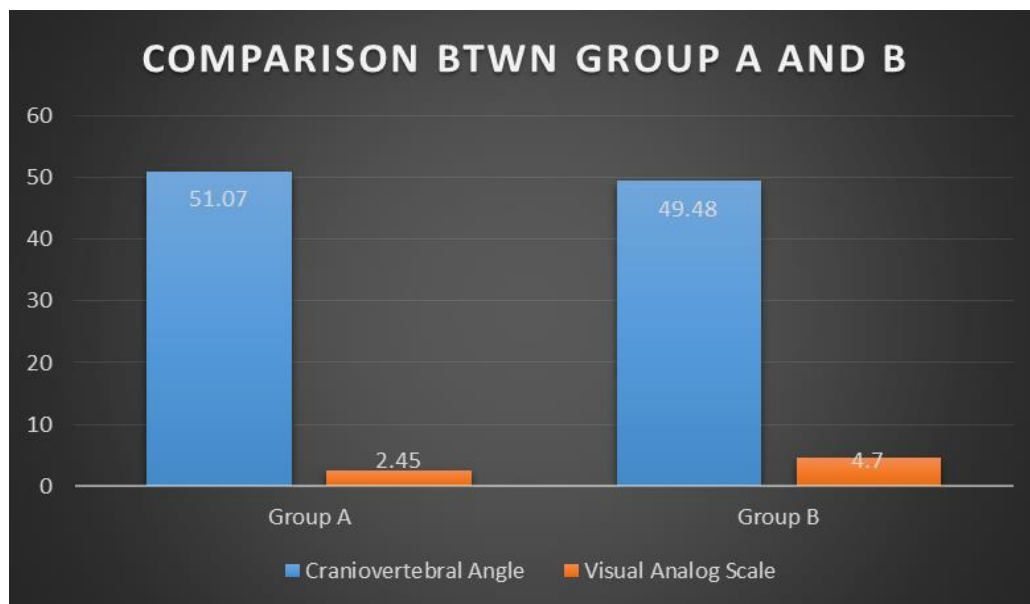
Comparison of mean difference of CVA and VAS among group A and group B

Comparison of mean difference of craniovertebral angle and Visual analog scale among group A and group B

Statistical Test used: Unpaired t test.

Mean difference of pre-intervention to post-intervention between group A and group B was compared with CVA and VAS. Both the groups (A and B) showed improvement in both the outcome measures but group A ($p < 0.001$, $t = 2.68$) showed significant increase in Craniovertebral angle range as well as reduction in pain intensity than group B ($p < 0.001$, $t = 3.26$). With degree of freedom 38.

Outcome Measures	Group A	Group B	T value	p value	Interference
Craniovertebral Angle	51.07 ± 2.23	49.48 ± 1.44	2.68	$p < 0.001$	Highly Significant
Visual Analog Scale	2.45 ± 1.79	4.7 ± 1.21	3.26	$P < 0.001$	Highly Significant



This above graph shows a comparison of the mean score of Craniovertebral Angle and Visual Analog Scale of between Group A and Group B. The above graph shows, increase in the degree of CVA mean value from 51.07 degrees of group A than 49.48 degrees of group B. As well as graph shows reduction in the pain intensity mean value from 2.45 of group A and 4.7 from group B. Both the outcomes shows significant difference in the mean value after the intervention but in comparison of both Maitland Mobilization shows better result.

RESULT

Immediate effect of Maitland Mobilization versus Muscle Energy Technique on non-specific neck pain associated with forward head posture in auto drivers- A Comparative study

Both the outcomes shows significant difference in the mean value after the intervention but in comparison of both, Maitland Mobilization shows better result.

DISCUSSION

The present study aimed at finding out the effect Of Maitland Mobilization and Muscle Energy Technique in improving the of craniovertebral angle and reduction in the non-specific neck pain by using 'ON Protractor App' for measuring the craniovertebral angle and Visual Analog Scale (VAS) in participants with non- specific neck pain associated with forward head posture . The results of the present study showed that there was a highly significant difference in the craniovertebral angle with ON Protractor App and Non-specific neck pain with Visual Analogue Scale (VAS) in both the groups after the intervention of Maitland Mobilization and Muscle Energy Technique respectively.

In Group A, as per graph marked increase in craniovertebral angle and reduction in pain intensity was observed, the result of Maitland Mobilization shows there was an increase in the mean value of the CVA from 45.66 ± 3.72 to 51.07 ± 2.23 . And as well as an decrease in the mean value of the Visual Analog Scale from 6.75 ± 1.29 to 2.45 ± 1.92 . As the Maitland Mobilization (MM)

is passive skilled manual technique used mainly to reduce pain and to improve movement. This technique is helpful to reduce pain and increase range of motion with applying grades, and it is widely used by therapists across the world. In this technique oscillations are given to the affected area in order to reduce the symptoms like reduction in the pain and correction of the abnormal posture.

Present study showed improved in craniovertebral angle and reduction in the intensity of pain. Grade 1 = small amplitude rhythmic oscillation beginning at the available range of motion. In MM along with the distraction oscillatory movements are given to affected area. Primary aim of Maitland Mobilization was the Maitland used on the severity, irritability and nature of spine pain. The mobilization create movement within the joints of the spinal segments which reduce stiffness and make movement easier. The increased ease of movement also reduce pain. Pain reduction in Maitland group was because of Neurophysiological, Nutritional effect and psychological effect of Maitland mobilization. Mechanism by which Maitland Mobilization improved the range of the angle are mechanical and Neurophysiological. Mechanical effect played significant role in permanent and temporary changes in length of connective tissue like joint capsule of zygapophyseal joints, muscles and ligament. While neurophysiological mechanism could improve mobility in response to application of posterior anterior forces by improving the perception of pain. Where the pain is caused due to the positioning the cervical in forward flexed posture which eventually leads to the pain due to stress on the muscle of cervical joint due to prolong abnormal posture which shows the muscle imbalance leads to weakness of muscle which hold neck in the proper alignment. Forward head posture tends to increase compressive loading on tissue in the cervical spine, mainly affecting the facet joints and ligaments. This mal-alignment of structure suggest to increase load on the posterior elements, affect the length-tension relation in the cervical spine muscle. Poor posture of C1 and C2 vertebrae that causes weakness of the posterior cervical muscles (sub occipital splenis, semispinalis).

In group B, graph showed an increase in the range of Craniovertebral angle and decrease pain intensity. The Muscle energy technique showed there was an increase in the mean value of the CVA from 47.09 ± 1.66 to 49.48 ± 1.44 . And as well as decrease in the mean value of the VAS from 6.4 ± 1.31 to 4.7 ± 1.21 . Muscle energy technique is one of the commonly used techniques to

reduce muscle tightness. It is considered easy, safe, simple, and minimizes the risk of tissue trauma. It is the manual technique used mainly by the clinician to improve the range and muscle strength. In MET physiotherapist does not control corrective force, the patient uses voluntary contraction of various intensities. This technique can solve muscle contractures or weakness of the muscle. Patient utilizes his voluntary muscle power for Post Isometric relaxation with resistance offered by the therapist. This technique commonly used by the clinicians to improve muscle power and movement at the joint segments and it improves the range of motion at the joint by finding the new barrier allowing stretch to the muscle either by an external force.⁶⁵ carried out by taking muscle or group of muscle into slow elongation and holding it into the stretched position, till participant feel the tissue resistance for a prolonged period of time with a sustained stretch force.^{8,16,66}

Where Muscle energy technique decrease hyperactivity or hyper action and tightness in shortened deep cervical extensors in forward head posture. The mechanism behind this result may be neurophysiological mechanism that it activated Golgi tendon Reflex, inhibit the alpha motor neuron and then by inhibited sub occipital muscle.

Secondary, traction is provided by the therapist stretched the fascia of the posterior neck and sub occipital muscle thereby improve the extensibility of muscle. Which normalize dural blood flow which eventually reduce the pain.

The result of group B showed an increase in the range of the CVA and VAS immediately after the intervention. It was supported by studies, there was an increase in the CVA and reduction in the pain intensity immediately after the intervention. The present study shows an increase in the CVA angle and Reduction in pain intensity (VAS) immediately after the Muscle Energy Technique intervention with the significance of ($p < 0.001$).

Graph, showed the comparison of mean difference of pre- and post-intervention between CVA and VAS among group A and group B. The mean difference of the CVA in group A was $51.07 + 2.23$ degrees and, in the group, B was $49.48 + 1.44$ degrees, it shows group A (Maitland Mobilization) was more effective than group B to increase range of Craniovertebral angle. The Mean difference of the VAS in group A was $2.45 + 1.79$ and group B was $4.7 + 1.21$, it shows in Decrease in the VAS in both groups. But group A (Maitland Mobilization) showed more improvement than group B (Muscle energy technique).

Group A, showed marked improvement in CVA angle as well as in VAS because Maitland Mobilization shows marked reduction in pain as well as improvement in the craniovertebral angel which ultimately reduce the abnormal curvature of cervical spine which leads to forward head posture and help to restore the normal posture for cervical spine in alignment to the body biomechanics. Once the structure of the spine comes in alignment there will no extra stress on the cervical muscle and muscle imbalance which leads to weakness and tightness of opposite structure of area or the surrounding with the neurophysiological effect on both joint capsule, ligaments and muscle.

Thus, the Maitland Mobilization is more effective than the Muscle Energy Technique in improving Craniovertebral angle and pain.

CONCLUSION

The present study concludes that Immediate effect of Maitland Mobilization and Muscle Energy Technique on nonspecific neck pain associated with forward head posture in auto drivers both are effective to improve the degree of CVA and reduction in the pain intensity using VAS. But we also conclude that the Maitland Mobilization has shown better improvement in craniovertebral angle and marked reduction in pain when compared with Muscle Energy Technique.

Implications for practice:

The single intervention of the Maitland Mobilization can be used to reduction in neck pain and improve Craniovertebral angle and correction of forward head posture, and it considered as an effective, safe, and simple option also in improve range of motion so, it can be included in a routine protocol for treatment.

Limitations of the study:

1. The current study measures immediate effect of two different techniques with no follow-up.
2. Sample size was limited as study was time bound.

Recommendations:

Further studies, with the longer follow up duration could be undertaken and to study for the maintains phase.

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ASSESSMENT SHEET

NAME OF THE SUBJECT:

DATE OF ASSESSMENT:

Age:
Gender:
Height:
Weight:
Occupation:
No. of working hours:
Visual analog scale:

0

10

Craniovertebral angle findings:

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