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ORIGINAL ARTICLE

A COMPARATIVE STUDY BETWEEN THE EFFECTIVENESS OF SMWAM VERSUS TRIGGER POINT RELEASE IN MECHANICAL NECK PAIN

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ABSTRACT

Background and Purpose: Mechanical neck pain is defined as pain that arises from the structures of the neck such as the muscles, ligaments, joints, intervertebral discs, or vertebrae and is typically caused by abnormal or excessive mechanical stress. It is usually localized to the cervical spine region and often worsens with movement or sustained postures, improving with rest or a change in position. Objective of the study was to compare the effectiveness of SMWAM versus trigger point release in Mechanical neck pain. **Method:** 30 subjects were used as a sample of age group 20 to 45 years of both genders are selected from the outpatient department of JKK Munirajah Medical Research Foundation College of Physiotherapy. Group-A was treated with SMWAM with ultrasound and isometric neck exercises and Group-B was treated with Trigger point release with ultrasound and isometric neck exercises in mechanical neck pain. Neck Disability Index (IND) and CROM were used as outcome measures assessed in pre- test and post-test assessment. Each patient was given a Physiotherapy program for 5 sessions per week for 4 week duration. **Result:** A results shows that there was significant improvement in both Groups but Group-A showed greater improvement on reducing pain and disability and improving cervical ROM than compared to Group-B. **Conclusion:** This study concluded that SMWAM with ultrasound and isometric neck exercises were significantly more effective than Trigger point release with ultrasound and isometric neck exercises in reducing pain and disability and improving Cervical ROM for mechanical neck pain.

Keywords: Mechanical neck pain, Spinal mobilization with arm movement (SMWAM), Trigger Point Release, Neck disability index (NDI), CROM.

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INTRODUCTION

Mechanical neck pain is characterized by pain or discomfort arising from the anatomical components of the cervical spine, such as the muscles, joints, ligaments, and surrounding supportive tissues.This type of neck pain typically arises due to postural stress, muscle overuse, joint dysfunction, or strain-related injuries.[1]Individuals with mechanical neck pain may experience by Stiffness in the neck region**,** a dull, aching pain**,** referred pain to the upper back **,**reduced range of motion (ROM)**,** pain during neck flexion or while returning to a neutral position**,** morning stiffness**,** symptoms worsen by poor posture or prolonged inactivity**.** This condition is often gradual in onset and frequently associated with everyday habits such as prolonged sitting, repetitive tasks, or improper sleeping posture[2].

The technique of Mobilization with Movement (MWM) was developed by New Zealand physiotherapist Brian Mulligan, combines manual joint mobilization with active patient movement to enhance joint function and relieve pain. When applied to the cervical spine along with upper limb movement, this method is referred to as Spinal Mobilization with Arm Movement (SMWAM). In this technique, a continuous lateral or transverse mobilization is applied to a cervical spinous process as the patient actively moves their arm in a direction that was previously limited. This method is based on the functional connection between the shoulder girdle and the cervical spine. This integrated approach aims to enhance spinal and shoulder mobility, reduce muscular tension, and improve overall function. If performed correctly, the method adheres to Mulligan's PILL principles: Pain-Free, Instant result, and Long-Lasting effects[4].

Trigger points are hyperirritable spots within tight muscle bands, often resulting in pain upon palpation or pressure. The signs and symptoms are taut muscle bands or nodules, local twitch responses on palpation, referred pain patterns, painful reactions (jump sign) when compressed. The causes of Trigger Points are direct trauma, repetitive strain, mechanical overload, emotional or psychological stress.

These contribute to localized muscle contraction, reduced oxygen and nutrient supply, and increased metabolic demand, leading to dysfunction.[7] The technique is ischemic compression, where sustained manual pressure is applied to deactivate the trigger point. Therapeutic goals include: pain relief, improved joint and muscle mobility, restoration of normal muscle function[5].

METHOD

The study was conducted at JKKMMRF College of Physiotherapy- Outpatient Department. The patient was informed about the whole procedure and treatment method. A written consent was obtained from their voluntary participation in this study. There were 30 patients with Mechanical neck pain were selected based on the inclusion and exclusion criteria and they were divided into 2 Groups, Group A and Group B. Group A was treated with SMWAM and Group B was treated with Trigger point release on mechanical neck pain.

Neck Disability index (NDI) and CROM were used as outcome measures. Each patient was given a Physiotherapy program for 5 sessions per week for 4 week duration. The pre and post treatment values were measured before and after 4 weeks for comparison.

Procedure and Protocols:

Intervention For Group-A: [SMWAM with Ultra sound & Isometric exercises]

Procedure for SMWAM: Patient position was sitting upright on chair and the therapist was standing behind the patient. The therapist hand was placed at the level of spinous process from medial aspect of the thumb of one hand, which is reinforced by the index finger of the other hand and transverse glide is apply from affected side to unaffected side and the glide is sustained, patient performs the movements (flexion/abduction/adduction) and the movement was perform at 6 to10 times. Treatment duration was 15-20min.

Intervention For Group-B: [TRIGGER PONT RELEASE with Ultra sound & Isometric exercises]

Procedure for Trigger point release: Patient position was forward lean sitting and the therapist was standing behind the patient. The therapist was to palpate the muscle to locate areas of tender point and apply gentle pressure over the triggered spot by using his/her thumb or pulp of fingers, hold for 10-30 sec, then release. After TrP, Stretch the muscle & encourage ROM exercises. Repeat 3-5 times. Treatment duration was 10-15 min.

Ultra Sound: Ultrasound therapy is non-invasive treatments that can help with reducing mechanical neck pain by increasing blood flow which can help relieve pain, improve circulation and promoting tissue healing.

Procedure for ultrasound: Patient position was Forward lean sitting and the therapist was standing near by the patient. The parameters are mode was Pulsed mode frequency 1MHz, intensity 1.5W/CM^2. Duration of treatment was 5 to 8 minutes.

Isometric exercises: Isometric neck exercises helps to improve deep muscle strength and are effective for treating mechanical neck pain (MNP).

Procedure for isometric exercises: Patient Sit in a chair with your feet flat on the floor and kept in a neutral position. Press your palm against your forehead and resist with your neck muscles, hold for 10 seconds and relax. Repeat 5 times. Treatment duration was 10 minutes.

RESULT

Neck Disability Index in GROUP-A & GROUP-B

Table 1: The comparative mean values, mean difference, standard deviation and unpaired "t" value between pre-test versus post-test score of Neck disability index in Group A and Group B.

Index Neck Disability	Mean	Mean Difference	Standard Deviation	Unpaired 't' Value
Group A	8.93	3.26	0.5162	23.04
Group B	5.67		0.1838	

The unpaired "t" value of 23.04 was greater than the tabulated "t" value of 2.05, which showed that there was statistically significant difference at 0.05 level, between the mean difference of Group A and Group B.

The Pre-test Versus Post-test mean of Group A was 8.93 and the Pre-test versus Post-test mean of Group B was 5.67 and the mean difference of Group A and Group B was 3.26, which showed that there was a greater improvement in group A than group B.

CROM (FLEXION) IN GROUP-A AND GROUP-B

Table 2: The comparative mean value, mean difference, standard deviation, and unpaired "t" value of CROM (FLEXION) in Group A and Group B

Flexion	Mean	Mean Difference	Standard Deviation	Unpaired 't' Value
Group A	12.07	5.14	0.3677	30.84
Group B	6.93		0.5303	

The unpaired "t" value of 30.84 was greater than the tabulated unpaired "t" value of 2.05, which showed that there was statistically significant difference at 0.05 level, between the mean difference of Group A and Group B.

The pre-test versus post-test mean of group A was 12.07 and the pre-test versus post-test mean of group B was 6.93 and the mean difference of group A and group B was 5.14 ,which showed that there was a greater improvement in group A than group B.

CROM (EXTENSION) IN GROUP-A AND GROUP-B

Table 3: The comparative mean value, mean difference, standard deviation, and unpaired "t" value of CROM (Extension) in Group A and Group B

Extension	Mean	Mean Difference	Standard Deviation	Unpaired 't' Value
Group A	19.60	5.87	1.4920	2.23
Group B	13.73		10.0913	

The unpaired "t" value of 2.23 was greater than the tabulated unpaired "t" value of 2.05, which showed that there was statistically significant difference at 0.05 level, between the mean difference of Group A and Group B.

The pre-test versus post-test mean of group A was 19.60 and the pre-test versus post-test mean of group B was 13.73 and the mean difference of group A and group B was 5.87, which showed that there was a greater improvement in group A than group B.

CROM (LATERAL FLEXION) IN GROUP-A AND GROUP-B

Table 4: The comparative mean value, mean difference, standard deviation, and unpaired "t" value of CROM (Lateral flexion) in Group A and Group B

Lateral Flexion	Mean	Mean Difference	Standard Deviation	Unpaired 't' Value
Group A	17.07	7.54	2.4607	10.02
Group B	9.53		1.5627	

The unpaired "t" value of 10.02 was greater than the tabulated unpaired "t" value of 2.05, which showed that there was statistically significant difference at 0.05 level, between the mean difference of Group A and Group B.

The pre-test versus post-test mean of group A was 17.07 and the pre-test versus post-test mean of group B was 9.53 and the mean difference of group A and group B was 7.54 ,which showed that there was a greater improvement in group A than group B.

CROM (ROTATION) IN GROUP-A AND GROUP-B

Table 5: The comparative mean value, mean difference, standard deviation, and unpaired "t" score of CROM (Rotation) in Group A and Group B

Rotation	Mean	Mean Difference	Standard Deviation	Unpaired 't' Value
Group A	23.20	4.60	2.6092	5.85
Group B	18.60		1.5627	

The unpaired "t" value of 5.85 was greater than the tabulated unpaired "t" value of 2.05, which showed that there was statistically significant difference at 0.05 level, between the mean difference of Group A and Group B.

The pre-test versus post-test mean of group A was 23.20 and the pre-test versus post-test mean of group B was 18.60 and the mean difference of group A and group B was 4.60 ,which showed that there was a greater improvement in group A than group B.

DISCUSSION

The study aimed to compare the effectiveness of SMWAM versus Trigger point release in Mechanical neck pain. The outcome measures were ROM and functional disability. The Neck disability index (NDI) and CROM were used as parameters.

A study sample comprised of 30 subjects was divided into 2 groups, Group A and Group B with 15 subjects in each group and age of subjects was 20 to 45 years. Group A were treated with SMWAM and Group B was treated with Trigger point release. The pre-test and post-test values were assessed by NDI and CROM (Flexion, Extension, Lateral flexion, Rotation) sseverity score in group A and group B. The paired t test value of NDI 16.86 and 12.47 and CROM Flexion 48.62 and 19.36, Extension 11.74 and 10.09, Lateral flexion 13.81 and 9.77, Rotation 14.62 and 14.25. The unpaired t test values for NDI 23.04 and CROM Flexion 30.84, Extension 2.23, Lateral flexion 10.02, Rotation 5.85 respectively.

In the analysis and interpretation of paired t test and unpaired t test the result showed a statistically significant results comparing with the table value with 0.05 level of significant of both groups between pre-test vs post-test results. The result obtained from statistical analysis indicates that there was a statistically significant difference between two groups in showing greater improvement in Mechanical neck pain. The reducing disability and improved in ROM was seen in all subjects received irrespective of the technique SMWAM and Trigger point release[6].

The alternate hypothesis is accepted and also there is significant difference between SMWAM and Trigger point release for improvement on reducing pain and disability and improving cervical ROM than compared to Group-B.

A study conducted by Dr. Basavaraj motimath (2017) conducted on patients with mechanical neck pain. 30 subjects were divided into 2 groups and each group 15 and one group received trigger point release, while the other received Sustained Natural Apophyseal Glides (SNAG) and also assessed by using the Neck Disability Index (NDI) and cervical range of motion (ROM) measured with a Universal Goniometer. Treatment was administered for one month. The results showed that the SNAG technique led to significantly greater improvements in cervical ROM, pain, and disability compared to trigger point release[7].

The study conducted by TRezkallah, Sohier S. (2021) compared the effects of Mulligan SNAGs with exercise, myofascial release (MFR) with exercise, and exercise alone with non-specific neck pain. Pain and disability levels were assessed with the Neck Disability Index, while range of motion (ROM) was evaluated using a Universal Goniometer. All treatments were administered over 12 sessions in 4 weeks. The results showed that both SNAGs combined with exercise and MFR combined with exercise significantly improved pain, range of motion, and functional disability in the short term [8].

This study conducted by Arul Pragassame S., (2021) on patients with cervical radiculopathy, randomly divided into two groups of 20 each. Group A was received by SMWAM combined with neurodynamics, intermittent cervical traction (ICT), interferential therapy (IFT), and neck exercises and Group B received only ICT, IFT, and neck exercises. Pain, ROM, and

functional disability were assessed using the Numerical Pain Rating Scale (NPRS), inch tape, and Northwick Park Neck Pain Questionnaire (NPQ). The study concluded that the combined approach in Group A was more effective in reducing pain and improving cervical ROM and function[9].

SMWAM produces various physiological effects that contribute to pain reduction and improved joint function. By applying a sustained glide to the facet joint while the patient performs active movement, SMWAM facilitates normal joint kinematics, enhances accessory movement, and reduces mechanical restrictions. This technique stimulates joint mechanoreceptors, which inhibit nociceptive input via the gate control mechanism, resulting in decreased pain perception. It also promotes neuromuscular re-education by improving proprioceptive input and restoring coordinated movement patterns. Furthermore, SMWAM indirectly reduces muscle guarding and tension by alleviating joint dysfunction, while also enhancing local circulation and tissue nutrition. These combined effects contribute to improved range of motion, decreased pain, and enhanced functional mobility, making SMWAM an effective intervention in managing conditions such as mechanical neck pain[10].

Trigger Point Release (TPR) exerts several physiological effects that contribute to pain relief and functional recovery in musculoskeletal conditions. By applying sustained pressure to hyperirritable points within taut bands of skeletal muscle, TPR helps reduce localized muscle tension and spasm through mechanical disruption of contracted fibers. This pressure induces temporary ischemia followed by reactive hyperemia, enhancing local blood flow, oxygenation, and the removal of pain-inducing metabolites such as substance P and bradykinin. The technique also restores normal muscle length and elasticity, improving flexibility and range of motion. Neurologically, TPR stimulates A-beta fibers and activates descending inhibitory pathways, thereby modulating pain through both spinal and supraspinal mechanisms. Additionally, the deactivation of trigger points improves proprioceptive feedback and neuromuscular coordination. Collectively, these effects support the use of TPR in reducing myofascial pain, restoring muscle function, and improving patient outcomes. Therefore, SMWAM shows more improvement in reducing reducing disability and improved in ROM.

CONCLUSION

This study showed that there was an increase in functional activity and decrease in neck pain in mechanical neck pain patients after the treatment of SMWAM with ultra sound and neck isometric exercises. The study concluded that SMWAM with ultra sound and neck isometric exercises was effective treatment for mechanical neck pain and also Neck disability index and CROM could be used as the assessment tool for Mechanical neck pain patients.

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