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Efficacy of Contralateral Sliding Technique Improving in Patients with Chronic Neck Pain

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Abstract:
Background: Chronic neck pain syndrome is characterised by headaches and neck pain that is also accompanied by numbness or discomfort in the arm. The symptoms of chronic neck pain syndrome include pain in the neck, arms, and/or neural tissue mechanosensitivity. Increased mechano sensitivity of neural tissues is the primary source of the pain in the neck and upper extremities that characterises chronic neck pain syndrome. However, conventional therapy is more frequently used to treat people with chronic neck pain condition. The purpose of this study is to determine whether slider neuro dynamics can effectively treat the main signs and symptoms of persistent neck pain.
Objective: To determine the impact of neural mobilisation on patients with chronic neck pain , by using a numerical pain rating scale.
Materials and methods: A Pilot study was done in Saveetha physiotherapy OPD, Saveetha medical college, and hospital Thandalam, Chennai. All ten patients were evaluated based on the criteria, with ten of them receiving neural mobilization treatment for three weeks. The outcome measure was a numerical pain rating scale.
Result: The gathered for pre- and post-test values, data were statistically analysed. The information was gathered and put via a paired t test analysis. The P value was less than 0.0001 (P0.0001), indicating that there was a significant difference between the pre- and post-measurement values. However, sliders neurodynamic improved more.
Conclusion: Following the delivery of median nerve sliders neurodynamic, the range of pain-free elbow extension increased. The interventions revealed a statistically significant improvement in the subject reported pain on the NPRS. This demonstrates that sliders, when utilised as a directing intervention in participants after a proper diagnosis, perform better than conventional workouts and supervision. This study found that individuals with persistent neck pain responded better to neural mobilisation treatment in terms of their numerical pain rating scores.

Keywords: Mechanosensivity, Chronic Neck Pain, Neurodynamic.

INTRODUCTION:

Approximately three-quarters of employment musculoskeletal conditions that restrict activity and result in work absenteeism are neck and upper limb disorders. Neck and upper limb pain is linked with both physical and psychosocial aspects of the workplace. [1]. The pain in the arm and neck were also preceded by cervicobrachial pain. It is a frequent complaint among physical therapy patients. Nerve root damage

can cause extensive functional impairments and disability. The neck pain that is accompanied by numbness or pain in the arm and upper back and with a headache is referred to as cervicobrachial pain syndrome (CBPS). Neck and arm pain with mechanical tenderness are symptoms of neurogenic cervicobrachial pain syndrome.[2]

Alternatively, cervical radiculopathy has been defined as a neurologic syndrome precipitated by compressive pathology and characterized by objective signs of sensory loss, motor loss, and/or decreased reflexes in a segmental pattern. Non-somatic or Cervicobrachial pain conditions may masquerade as cervical radiculopathy since they produce referred or radiating pain from injured tissue structures.[3]

Cervical somatic origins of cervicobrachial pain are inflammatory neural tissues, upper quarter muscle imbalances with corresponding trigger or sensitivity sites, cervical discs, facet joints, and visceral organs Cervical radiculopathy is a clinical expression to denote pain radiating into the arm related to the dermatome of the involved cervical nerve root cervical radiculopathy to denote those patients with symptoms involving dysfunction of the spinal nerve roots of the neck.[4]

When inflamed neural tissues are recognized as the underlying cause of symptoms, neurogenic cervicobrachial pain syndrome may arise. This syndrome is characterized by a wide range of symptoms that may impact individuals differently. To properly diagnose this condition, careful evaluation with a comprehensive history, physical examination, and proper diagnostic tests is essential.[5] It should be differentiated among different possible causes like red flags for visceral disorders, neuro musculoskeletal causes, psychological, and occupational factors. Red flags for underlying cardiovascular, pulmonary, or gastrointestinal conditions should be excluded before starting any intervention.[6]

Neurogenic cervicobrachial pain syndrome may be caused by inflamed neural tissues. Symptoms of the syndrome may be variable and present differently in different individuals. Proper diagnosis involves a thorough evaluation, such as history taking and physical examination.[7] Differential diagnosis must consider red flags for visceral disorders, neuro musculoskeletal conditions, psychological factors, and occupational factors. It is important to exclude possible cardiovascular, pulmonary, and gastrointestinal causes prior to treatment.[8]

Sliding movements that produce shortening of the nerve bed at one joint and lengthening of the nerve bed at another joint are matched in a therapy known as slider neurodynamics. This new therapy capitalizes on large amplitude movements, which serve to restore normal biomechanics of the neural structure in a nonsymptomatic range and thereby significantly decrease the likelihood of worsening the symptoms. Cervicobrachial pain syndrome (CBPS) is often misdiagnosed and treated as nonspecific mechanical neck pain in the clinic. [9] Conservative management of CBPS has a broad array of treatments ranging from rest, use of a cervical collar, tractioning, ultrasonography, and exercises to strengthen the neck muscles. The primary aim of these treatments is relief of symptoms because both pain and dysfunction are the most common reasons patients seek medical attention.[10] By incorporating slider neurodynamics into existing treatment protocols, healthcare providers are better able to address the distinctive biomechanical challenges of CBPS.[11]

A method of neural mobilisation developed by researchers Butler and Shacklock target the neural tissue in a specific manner, which reduces the mechanosensitivity of the nerve. This reduction significantly reduces symptoms and increases the overall mobility of the nerve7.[12] In this specific research, median nerve sliders neurodynamics (also known as MNT-1) were used to thoroughly investigate how chronic back pain syndrome (CBPS) primarily affects the C5-C6 segment of the cervical spine. [13] It was discovered that 36.1 percent of the patients had C6 nerve root involvement. It must be noted that the C5

and C6 nerve roots significantly contribute to the autonomic supply of the median nerve, and therefore such patients commonly present with symptoms of the area of distribution of the median nerve.[14]
But with the application of a variety of treatments, usually, radiculopathy is typically observed to improve without the need for surgery. Surgical treatment is typically indicated in instances where patients still experience persistent and unrelenting pain following an adequate trial of non-surgical management, and instances where there is a discernible progression of weakness, or the appearance of new or progressive cervical myelopathy symptoms.[15] Moreover, the conduct of prospective studies comparing the different treatment modalities available would have important advantages by enabling practitioners to make informed decisions towards the optimal possible and cost-effective evaluation and treatment for those who suffer from cervical radiculopathy.[16]
There are many physical therapy interventions specifically designed to target this specific condition, and they vary from mobilization, manipulation, and exercise therapy, among others. There is one which has not been as extensively investigated, and it could very well have unique advantages regarding the relief of neural tension and facilitation of mobility of the cervical spine. [17] Thus, the present study is conducted with the aim of determining the efficacy of this less extensively studied treatment in comparison with conventional and traditional therapy interventions frequently used in practice.

METHODS:

Participants and selection criteria:

The 10 people who participated in this pilot study had chronic neck pain. An official written informed consent form was signed by each individual. A random selection of individuals was made using the inclusion and exclusion criteria. Those who had subacute upper quarter discomfort in their necks, parascapular regions, and upper limbs for two to twelve weeks, as well as those with high NPRS values and overt responses during MNT-1, were included in this study. Participants were male and female between the ages of 18 and 40. The subjects were disqualified if they displayed any symptoms of past cervical spine injury or surgery, or if their upper quarter had a fixed abnormality that would prevent them from undergoing further evaluation and treatment. The assessment of pain was done by using the NPRS and MNT-1 test was utilised to assess median nerve mechanosensitivity. The study setup was Saveetha physiotherapy OPD, Saveetha medical college, and hospital, Thandalam, Chennai. The NPRS and MNT-1 were assessed before and after the intervention.

Procedure:

The 10 people who participated in this pilot study had chronic neck pain. An official written informed consent form was signed by each individual. A random selection of individuals was made using the inclusion and exclusion criteria. In this research, male and prior to beginning treatment, MNT-1 was used to assess the severity of the chronic neck pain in all 10 patients. Additional assessments were then performed on both the affected side and the contralateral side for comparison, and a consent form was obtained from each patient to confirm their willingness to take part in the study. This was a pilot study that involved 10 individuals. The patient underwent evaluation both before and after neural mobilisation. To prevent the influence of outside influences on the study outcome, patients were asked not to participate in any additional therapies during the time, and all data was logged. This was a pilot study with 10 Indian participants. The therapist performed the MNT-1 test and assessed the patient; during the test, the patients were instructed to report any pain they were experiencing at the time. A mark was made with tape 19 cm from the medial epicondyle while the patient was lying on the dorsal forearm, and an inclinometer was

placed at the mark to measure the elbow extension range of motion. The affected upper limb was moved sequentially by the therapist in the following positions: 110° shoulder abduction, 180° glenohumeral external rotation, 180° forearm supination, 180° wrist and finger extension, and 180° elbow extension. When the patient complained of pain, the elbow extension movement ceased, and the inclinometer's measurement of elbow extension range of motion was taken. On the same day that the intervention began, the patients were given exercises to practise rhythmically moving their elbows from flexion to extension in pain-free motion, before being placed in the MNT-1 position while supine. The individual was instructed to passively translate their head in an ipsilateral direction while extending their elbows until there was no more pain or only barely acceptable discomfort. Following this, the patient was told to flex their elbows as the therapist repeated translatory glides till neutral, 3 sets and 10 repetitions on each set, 1 minute of rest in between sets, and a total of 10 repetitions at the end. The patients performed the activities. as a home-based programme five days per week
and The NPRS score was evaluated at the beginning of the study and the end of the study The results, as well as the data collected, were tabulated and evaluated.

STATISTICAL ANALYSIS:

The research is now being piloted with ten patients. The data's mean and standard deviation were derived. Using paired t-tests, the values before and after neural mobilization were compared. The severity of chronic neck pain or pain evaluated by the NPRS, Significant was determined as a p-value of less than 0.001.

RESULT:

The study included 10 participants with a mean age of 36.4 ± 5.2 years. All participants completed the intervention without any reported adverse effects.

Statistics were used to compare the pre- and post-test NPRS score values from the data acquired. A statistically significant difference exists, and the treatment had a higher impact on the outcome than would be expected by chance. (P=<0.0001). The NPRS pre-test mean was 6.10, and the standard deviation was 0.99. The NPRS post-test mean was 4.00, and the standard deviation was 0.82.

DISCUSSION:

The NPRS is used to compare pre- and post-intervention values in the following study to examine the impact of neurodynamic median nerve sliders for treating persistent neck pain in people between the ages of 18 and 40. To determine the values, relevant data was statistically evaluated.

Patients with cervicobrachial pain syndrome have pain in their neck, shoulders, and arms as well as increased mechanosensitivity in their neural tissue. The upper limb tension test or Elvey criteria were used to screen the participants in the current study using the diagnostic standards for CBPS. Studies assessing the outcomes of movement-based treatment are still rare. Determining the effects of neurodynamics, which entails gently mobilising the neural system, on individuals with symptomatic chronic neck pain was the aim of the current study. According to the conclusions made from the data, the subjects' reported NPRS cores and passive pain-free elbow extension ROM showed statistically significant improvement following the intervention and the neurodynamics intervention is more specific to the pathology of CBPS. The findings show a clear improvement in the subjects' reported pain on the NPRS and passive pain-free elbow extension ROM during MNT1.

The neurodynamics of the slider's neck and elbow movements caused the nerves to travel in the same direction, having a cumulative impact, according to the study by Coppeiters et al. from 2009, which found that the sliding technique produced an excursion that was twice as large as tensioners and other nerve gliding techniques Most viscoelastic effects, it has been reported, manifest themselves within a few seconds after exerting force on brain structures. Therefore, nerve movement is superior than stretch (tensioner's). Therefore, most mobilization's mechanical advantages become apparent when it is advised in an oscillatory manner.[12]

Peripheral nerve pain can come in two different forms: dysesthesia pain and pain in the nerve trunk. In contrast to pain in the nerve trunk, which is felt along the nerve trunk's course, dysesthesia pain, which is brought on by damaged nociceptive axons, is felt in the peripheral sensory distribution of a sensory mixed nerve. It is also brought on by an increase in activity in the nociceptive sensory fibres, also known as nerve nervorum, which contain chemically or mechanically sensitive nerves that cause pain in the connective tissues of peripheral nerve trunks.[14]

The oscillatory motions help to reduce the pain threshold. If The symptoms were due to intraneural oedema, and it is thought that sliders create the milking or pumping effect, which circulates inflammatory chemicals locally throughout the neurons. Participants can distinguish between painful and pain-free movements using slider neurodynamic, which presents movement to the brain in novel ways and decouples acquired expectations of pain. As a result, the respondents' functional level in their everyday activities improves. It is reasonable to suppose that an increase in elbow extension range of motion without pain is associated with a decrease in the severity of the patient's handicap and an enhancement of their ability to do their functional tasks. The conventional treatment for acute and/or chronic mechanical neck discomfort comprises exercises, collars, ergonomic advice, etc., either singly or in combination. However, there is little proof of the benefits of the same.[18]

In vivo studies on nerve biomechanics reveal that joint movement and adjacent joint positions significantly influence nerve excursion and strain. Sliding techniques produce greater nerve movement than tensioning techniques, with median nerve gliding higher with elbow extension and ipsilateral cervical flexion. The degree and direction of joint movement also affect nerve behaviour, with strain and excursion varying based on specific angles and motion paths. This highlights the importance of precise joint positioning in neurodynamic techniques.[19]

The study analysed the effectiveness of manual therapy and home-based exercises in treating Cervicobrachial Pain Syndrome (CBPS). Results showed significant improvements in pain intensity and disability scores, indicating a significant therapeutic overlap. The study also highlighted the influence of specific and non-specific treatment mechanisms, such as patient expectations, therapist interaction, and therapeutic alliance. Regular reassessment during treatment is crucial for identifying patient improvement timing and rate. This approach mirrors clinical practice, where skilled therapists modify treatment techniques based on the patient's evolving presentation. The results support the clinical relevance of integrating manual therapy with active patient participation through home exercises. However, further research is needed to refine intervention protocols, identify optimal timing of reassessments, and clarify specific versus generalized treatment effects.[20]

CONCLUSION:

However, there is little evidence of its benefits. The majority of these neck pain sufferers improved after receiving neural mobilisation treatment. With neural mobilisation therapy, the prognosis for neck

discomfort is favourable. According to the results of this study, the treatment (neural mobilisation) for patients with persistent neck pain improved in terms of pain relief.

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