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Effects of sustained natural apophyseal glides combined with transcutaneous electrical nerve stimulation in cervical radiculopathy

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ABSTRACT

Background: Cervical radiculopathy, is a condition where a nerve in the neck is compressed or irritated where it branches away from the spinal cord. This typical condition has various consequences such as radiating pain, numbness, sensory deficits or motor dysfunction in the neck and upper extremities. **Objective:** To analyze the effects of Sustained Natural Apophyseal Glides (SNAGs) combined with Transcutaneous Electrical Nerve Stimulation (TENS) in Cervical Radiculopathy. **Material & Methods:** A Quasi experimental study design was selected. Samples of 20 male and female participants diagnosed with cervical radiculopathy were assigned to receive SNAGs combined with TENS. Age of population between 35 to 55 years. The duration of intervention was 4 weeks, at 4 sessions per week. The Visual Analogue Scale (VAS) for pain and Goniometer for cervical range of motion (ROM) were assessment tools used for all the participants before and after 4 weeks of physical therapy intervention. All the participants were assessed through VAS and Goniometer before intervention and at the completion of 4 weeks program. P-value of mean was used to analyze the data. **Result:** From the findings it is concluded that SNAGs combined with TENS was more effective in the treatment of cervical radiculopathy.
Conclusion: Subjects with cervical radiculopathy treated with sustained natural apophyseal glides combined with transcutaneous electrical nerve stimulation were found to be more effective in reduction of pain intensity and improve range of restricted motion.

Keywords: Cervical Radiculopathy, Sustained Natural Apophyseal Glides, Transcutaneous Electrical Nerve Stimulation, Visual Analogue Scale, Goniometer, Range of motion.

INTRODUCTION

Cervical radiculopathy, commonly called a “pinched nerve” occurs when a nerve in the neck is compressed or irritated where it branches away from the spinal cord [1]. This impingement typically produces neck and radiating arm pain or numbness or sensory deficits or motor dysfunction in the neck and upper extremities [2].

Cervical radiculopathy occurs with pathologies that causes symptoms on the nerve roots [3]. Those can be compression, irritation, traction, and a lesion on the nerve root caused by either a herniated disc, foraminal narrowing or degenerative spondylitic change (Osteoarthritic changed or degeneration) leading to stenosis of the intervertebral foramen [3][4].Cervical radiculopathy commonly affect population around the age of 45 years in their life [5]. A large variation has been found in its prevalence among males and females although most studies indicate the prevalence on a higher side in males. In cervical radiculopathy, patient experience pain, numbness, sensory defects and or motor loss or defects in the upper limb including neck and sometimes in scapula as well. The radiation of pain has been documented to be unilateral as well as bilateral, though bilateral cases have been only 5-36% [6].

Cervical radiculopathy can be a significant cause of neck pain and disability. The reported annual incidence of CR is 83.2/100,000 person [5], while the reported prevalence is 3.5/1000 persons [7]. Gender preference varies [7][8]. Individuals are most commonly affected in the 5th and 6th decades of life [5][6]. Physical exertion or trauma at onset is rare, involving less than 15% [5]. Causal relationship to an automobile accident ranges from 3–23% [5][6]. Patients presenting with cervical radiculopathy most frequently complain of neck pain, paraesthesia and radicular pain [5]. While sensory symptoms typically present along a dermatome, pain is often myotomal [9]. When present, dermatomal pain patterns are more frequent at the C4 level (60%) as compared to the C7 (34.2% of cases) and C6 levels (35% of cases). Scapular pain is found in 51.6% of cases [8]. Physical examination typically reveals painful cervical spine range of motion (ROM) and decreased deep tendon reflexes. Upper limb weakness involves only 15% of cases. Decreased sensation is found in 1/3 of cases; however, muscle atrophy presents in less than 2% of cases [5]. Level of involvement is most typically the C7 (39.3%–46.3%) and C6 (17.6%–42.6%) nerve roots [5][6].Pakistan is one of the developing countries [10] and like many other medical conditions, unfortunately not much electronic data is available regarding the topic; reasons being unwillingness of clinicians to participate in research process, unawareness to consult proper authority, self-medications and traditional treatments [11].

As a treatment intervention, both surgical and conservative procedures are available, although surgical management has not been supported much by literature. The present study focused on determining a suitable conservative intervention for cervical radiculopathy [12] by the effects of sustained natural apophyseal glides combined with transcutaneous electrical nerve stimulation.

MATERIALS AND METHODOLOGY

SUBJECTS

Twenty individuals of (12 males and 08 females) between the age of 35 to 55 years with diagnosis of cervical radiculopathy, participated in this study. The design of study was pre-test and post-test group with dependent variables were pain level and functional disabilities. All participants signed the informed consent form. Yusra research ethical committee approved the study. The independent variable was sustained natural apophyseal glide combined with TENS. Patients completed a variety of self-report measures followed by a standardized history and physical examination such as spurling test, cervical distraction test and cervical range of motion performed by therapist self-report measures includes visual analogue scale (VAS) and Goniometer.

The standardized history includes demographic information including age, gender, past medical history and nature of symptoms, relieving/aggravating factors. The standardized physical examination included measurements of active cervical range of motion. The evaluate instrument included, the 10-point VAS ranges from 0 (“no pain”) to 10 (“worst pain imaginable”) and was used to indicate the intensity of current pain.

INTERVENTION

The duration of intervention was 4 weeks, at 4 sessions per week. The treatment was implemented as follows.

Sustained Natural Apophyseal Glide

A sustained natural apophyseal glide (SNAGs) is useful for treatment for the cervical, thoracic and lumbar spines. SNAGs are a combination of a sustained facet joints with movement. SNAGs are always involved with the end range of joint movements [13]. Three sets of ten repetitions were performed.

To increase rotation and decreased the pain with this movement.

The patient was seated, and physiotherapist stands behind him. The medial border of physiotherapist's thumb (distal phalanx) is placed on the end of the spinous process of the vertebra above the suspected site of the lesion. The thumb nail would slope at approximately 45', in the direction of the eyeball. Physiotherapist other thumb reinforce this. This means that if the patient has a lesion at cervical 5/6 your thumb would be on the cervical 5's spinous process. The border of physiotherapist's thumb is used because the spinous process is very small and the terminal pad would not be selective enough as it too wide. Other fingers of physiotherapist are comfortably placed laterally on the mandible or just below. These fingers will give some lift and prevent the neck from flexing. Physiotherapist now move the spinous process up in the direction of the treatment plane. While this facet glide is being managed ask the patient to turn his head slowly in the restricted painful direction. As the head rotates you must follow with your hands to ensure that the mobilization with movement taking place, remains along the treatment plan. If SNAGs are indicated and the technique is correct, the patient will be able to rotate his head further and feel no pain. Get the patient to apply overpressure. Sustain the mobilization until the head returns to the midline. Repeat several times and then reassess, unassisted active movements should now be much better.

To increase side flexion and decrease the pain associated with this movement.

The procedure is virtually the same as for rotation. The patient is seated. Physiotherapist stands behind the patient with thumbs over the spinous process of the vertebra (as for rotation) above the suspected site. When treating cervical 5/6 locate on cervical 5. The patient slowly actively side flexes to the restricted and/or painful side while physiotherapist apply a sustained pressure up along the facet planes. With the side flexion the vertebra tilts on the one beneath. Physiotherapist tilt his hands with it to ensure that as you push up, the upper facets move correctly.

Remember to have the patient apply side flexion overpressure with a hand pushing the head over and sustain this end range position for two seconds.

To increase flexion and decreased the pain associated with this movement.

Physiotherapist stand behind the seated patient with yes, one thumb reinforced by the other, placed over the superior spinous process of the spinal segment requiring therapy. As the patient flexes his neck you push up along the treatment plane. In full flexion the treatment plan will be nearly horizontal. Several repetitions should bring results.

To increase extension and decreased the pain associated with this movement.

The patient is seated and thumb of physiotherapist are again used on the upper spinous process of the cervical segment involved. The patient slowly extends his neck once, while push up along the facet treatment plane [13].

RESULTS

Twenty subjected were included 12 males (60%) and 08 females (40%). The mean of their age was 43.55 ± 1.15 years. The mean value of their weight was 64.25 ± 2.29 kg and the mean value of their height was 168.27 ± 1.65centimeters. The mean value of VAS pre-test 7.40±0.46 and post-test 5.70±0.33. The mean value of ROM of cervical flexion pre-test 47.50±1.89 and post-test 57.50±2.33 degree. The mean value of ROM of cervical extension pre-test 38.75±3.00 and post-test 57.50±2.33 degrees. The mean value of ROM of right side cervical rotation pre-test 51.72±2.83 and post-test 64.25±2.67 degrees. The mean value of ROM of left side cervical rotation pre-test 56.25±3.40 and post-test 65.00±2.88 degrees. The mean value of ROM of right side cervical lateral flexion pre-test 23.16±1.90 and post-test 28.16±1.75 degrees. The mean value of ROM of left side cervical lateral flexion pre-test 24.00±1.95 and post-test 29.50±2.17 degrees.

Table 1: Demographic data of all subjects

Factor	MEAN± SEM
Age (years)	43.55 ±1.15
Weight (kg)	64.25 ±2.29
Height (cm)	168.27 ±1.65

Table 2: The Mean and SEM of Visual analogue scale and cervical range of motion pre-test and post-test

	SNAGS MEAN ± SEM		t-value	p-value
	PRE-TEST	POST-TEST		
VISUAL ANALOG SCALE	7.40±0.46	5.70±0.33	2.641	0.0052
ROM CERVICAL FLEXION IN DEGREE	47.50±1.89	57.50±2.33	3.487	0.0012*
ROM CERVICAL EXTENSION IN DEGREE	38.75±3.00	57.50±2.33	4.9201	**0.0001***
ROM CERVICAL LATERAL FLEXION (RIGHT SIDED) IN DEGREE	23.16±1.90	28.16±1.75	1.8792	0.0683
ROM CERVICAL LATERAL FLEXION (LEFT SIDED) IN DEGREE	24.00±1.95	29.50±2.17	1.9028	0.0647
ROM CERVICAL ROTATION (LEFT SIDED) IN DEGREE	56.25±3.40	65.00±2.88	1.9638	0.0569
ROM CERVICAL ROTATION (RIGHT SIDED) IN DEGREE	51.72±2.83	64.25±2.67	3.2058	**.0027***

*Significance level ≤ 0.005

DISCUSSION

Although significant improvements were found, the manual therapy showed better results on all outcome measures, including pain, functional disability, spinal range of motion, and return to work. The effects were largely gained during the 4-week treatment period.

The purpose of this study is to evaluate the effects of Sustained Natural Apophyseal Glides (SNAG) combine with TENS in cervical radiculopathy. The results of this study demonstrated significant improvement in visual analogue scale and range of motion (ROM) of cervical flexion and right sided cervical rotation. There was statistically highly significant improvement in range of motion (ROM) of cervical extension. Slump stretching in addition to lumbar spine mobilization and exercise was beneficial in reducing short-term disability and improving pain and promoting centralization of symptoms of patients [17]. Our results provide no evidence to support this study. This rationale of this report was to depict treatment options for patients with CR which vary from non-surgical management to surgery. There is strong evidence to indicate that patients who had been given conservative treatment experienced positives outcomes as compared to those who underwent surgery [8].

There are several type of non-surgical interventions used for the treatment of CR including manual therapy, cervical traction, exercises and postural education [14]. Electrotherapy commonly used in the conservative treatment of cervical radiculopathy, has varying results. During acute phase of cervical radiculopathy, cervical collar has also been used for immobilization and pain control [15][16].The result of the study was supported by Syed Abid Mehdi Kazmi et al (2012), the use of manual therapies decreased the pain intensity in the mulligan and the manipulation group in the cervical pain [17].The result of the study was supported by Abid ali et al (2014), patients with nonspecific neck pain treated with SNAGs manual physical therapy techniques and followed by isometric exercises was more effective in reduction of pain and enhancement of function, as compared to those patients treated with SNAGs manual physical therapy techniques alone [18].

CONCLUSION

Subjected with cervical radiculopathy treated with sustained natural apophyseal glides combined with transcutaneous electrical nerve stimulation are more effective in reduction of the pain intensity and improve range of motion which was restricted. More research work is needed to establish the effects of sustained natural apophyseal glides in cervical radiculopathy.

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