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Impact of Sustained Natural Apophyseal Gliding Technique on Neck Pain and Cervical Range of Motion in Subjects with Cervicogenic Headache

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Abstract: ***Background and Purpose**: Cervicogenic headache is a secondary type of headache that can be defined as the pain experienced in head but the real source is found on the cervical spine. Cevicogneic headache includes headache associated with neck pain and stiffness. Cervicogenic headaches are unilateral, starting from one side of the posterior head and neck, migrating to the front and sometimes are associated with ipsilateral arm discomfort. C_1-C_2 Sustained natural apophyseal Gliding Technique is used to reduce neck pain and improve cervical range of motion in subjects with cervicogenic headache. Many studies focused on different methods, but very few studies aimed to compare. **Methodology**: 20 cervicogenic headache patients were randomized into two groups. Group A receives Sustained natural apophyseal gliding technique whereas Group B receives placebo SNAG technique for Duration of 8 weeks. Neck Disability Index is used to assess the neck pain and cervical range of motion before and after the treatment. **Result**: The group analysis of Group A revealed that there is a significant effect in experimental group by using Neck disability index as a outcome measure with p value <0.0001. **Conclusion**: The Sustained Natural apophyseal gliding technique is effective in decreasing neck pain and increases cervical range of motion in subjects with cervicogenic headache.*

Keywords: Sustained natural apophyseal glide (SNAG)

1. Introduction

Cervicogenic headache is a secondary type of headache that can be defined as the pain experienced in head but the real source is found on the cervical spine. The term cervicogenic headache was first coined by Norwegian Physician Dr.Ottar Sjaastad in the year 1983, and the term cervicogenic headache was recognized by the international Headache society in the year 1988 as a secondary headache.[1] Cervicogneic headache includes headache associated with neck pain and stiffness. Cervicogenic headaches are unilateral, starting from one side of the posterior head and neck, migrating to the front and sometimes are associated with ipsilateral arm discomfort.[2]

The main mechanism is believed to be the convergence of C1, C2, C3nerves at the neurons of the dorsal horns of the spinal cord which is associated with the C1, C2 andC3 nerves to be experienced in body areas which are innervated by the trigeminal nerve.[3]

Bogduk has proposed that the pathophysiology of CGH results from a convergence of sensory input from the upper cervical spine in to the trigeminal spinal nucleus, including input from:

- Upper cervical facets.
- Upper cervical muscles
- C2-C3 intervertebral disc
- Dura mater of the upper spinal cord
- Posterior cranial fossa.[4]

Causes for cervicogenic headache are

- Trauma to the facet joints, such as fracture or dislocation
- Whiplash injury commonly associated with rear-end car accidents, which has been estimated to account for 53% of CGH cases
- Rheumatoid arthritis of the facet joints
- Herniated disc, in which the annulus fibrosus tears and the nucleus pulposus leaks inflammatory proteins
- Spinal degeneration due to aging such as cervical degenerative disc disease or osteoarthritis of the facet joints
- Cancer or benign tumors in the cervical region may compress or pinch the cervical spinal nerves causing pain.[5]

Signs and symptoms for cervicogenic headache:

1) Precipitation of head pain, similar to the usually occurring one:
a) By neck movement and/or sustained, awkward head positioning, and/or:
b) By external pressure over the upper cervical or occipital region on the symptomatic side.
c) Restriction of the range of motion (ROM) in the neck.
d) Ipsilateral neck, shoulder or arm pain of a rather vague, non-radicular nature, or occasionally-arm pain of a radicular nature.

2) Confirmatory evidence by diagnostic anaesthetic blockades

3) Unilaterality of the head pain, without sideshift.

4) Head pain characteristics:
Moderate -sever, non-throbbing pain, usually starting in the neck.

5) Only marginal effect or lack of effect of indomethacin. Only marginal effect or 6 lack of effect of ergotamine and sumatriptan. Female sex. Not infrequent occurrence of head or indirect neck trauma by history, usually of more than only medium severity.

6) Various attack-related phenomena, only occasionally present, and/or moderately expressed when present: a) nausea, b) phono-and photophobia, c) dizziness, d) ipsilateral "blurred vision", e) difficulties swallowing, f) ipsilateral oedema, mostly in the periocular area.[7]

Two different Diagnostic criteria for CGH are: The Cervicogenic International study Group (CGISG) and the International Headache Society- International Classification of Headache Disorders (IHS-ICHD) have outlined two different sets of diagnostic criteria to diagnose CGH.

1) Confirmation of pain source by diagnostic nerve block Injections.
2) Flexion-Rotation test

Diagnostic nerve blocks: Diagnostic nerve block injections are used to test the exact source of pain in the cervical spine. The technique involves injecting a pain-relieving anesthetic or anti-inflamatory solution around the nerve/joint. Medical imaging such as fluoroscopy (x-ray guidance) accompanied by contrast is used to guide the needle to the correct spot. Pain relief from these injections may be seen in all areas innervated by the nerve, including regions in the head.[8]

Need of Study

Cervicogenic headache is a secondary type of headache that can be defined as the pain experienced in head but the real source is found on the cervical spine. Mobilization with movement discovered and developed by Brian Mulligan is a novel concept. One of the technique that is used - Sustained Natural Apophysial Glides (SNAGs) are a separate technique involving a combination of a sustained facet glide with active motion, which is then followed by overpressure. However, still is little known about effectiveness of this approach in this group of patients. Hence the purpose of this study is to find out the effectiveness of SNAG technique on Neck pain and Range of motion in subjects with cervicogenic headache.

Aims

The aim of the study is to evaluate the effectiveness of sustained natural apophyseal glide technique on neck pain and range of motion in subjects with cervicogenic headache.

Objective

1) To assess the effectiveness of sustained natural apophyseal glide technique on neck pain in subjects with cervicogenic headache.
2) To find out the effectiveness of sustained natural apophyseal technique on range of motion in subjects with cervicogenic headache.

2. Materials & Method

Materials required for the study:

- Couch
- Data collection sheet

Study design: Experimental study

Sampling technique: Simple random sampling

Sample size: 20 subjects

Duration of the study:

Source of Data: This is done at SIMS College of physiotherapy, outpatient department Guntur. The subjects will be considered for this study only after they sign on consent form.

Eligibility Criteria:

Inclusion Criteria:

- Subjects with cervicogenic headache
- with age group between 18 -50 years
- Who are co-operative and comprehending
- Numerical pain rating scale [0-10] score between 4 to 9 to ensure group homogeneity.
- Unilateral occipital and neck pain.
- Restricted and painful movements, especially rotation and lateral flexion to the painful side.

Exclusive Criteria:

- Neck pain that was not of mechanical origin.
- Patients with recent major trauma or fracture of the cervical spine.
- Severe musculoskeletal and neurological problems.
- Postural hypotension.
- Cervical spondylosis
- Subjects with Herniated disc, Neurologic problem, fracture, surgical and injection therapy record to reduce pain.

3. Procedure

A total of 20 subjects with cervicogenic headache were included in the study and divided into two Groups, A and B, 10 in each group. Group A subjects are given sustained natural apophyseal gliding technique and group B are treated with placebo sustained natural apophyseal gliding.

Subjects in group A are given with – SNAG technique as a means of relieving neck pain and improves cervical range of motion. The subject is seated and the therapist stands front and side of the patient. The patients head is cradled between the therapist body and his left arm. The left index, middle, and ring fingers wrap around the base of occiput, and the middle phalanx of little finger lies over the spinous process of C2 vertebra. The lateral border of the right thenar eminence lays over the left little finger. A gentle pressure is now applied by the therapist in a ventral direction (45 degrees) on the spinous process of C2 vertebra. Gliding was applied rhythmically 3 times per second and the width of gliding starts from middle to the end. The therapist kept on gliding the small joint, and made the patient turn his head to the side of limited mobilization and pain. When the patient was turning his head, the therapist fixed the head stably with his hand on the spinous process following the treatment spot in order to maintain the SNAGs technique, and remained in the position for atleast 10 sec. This treatment was

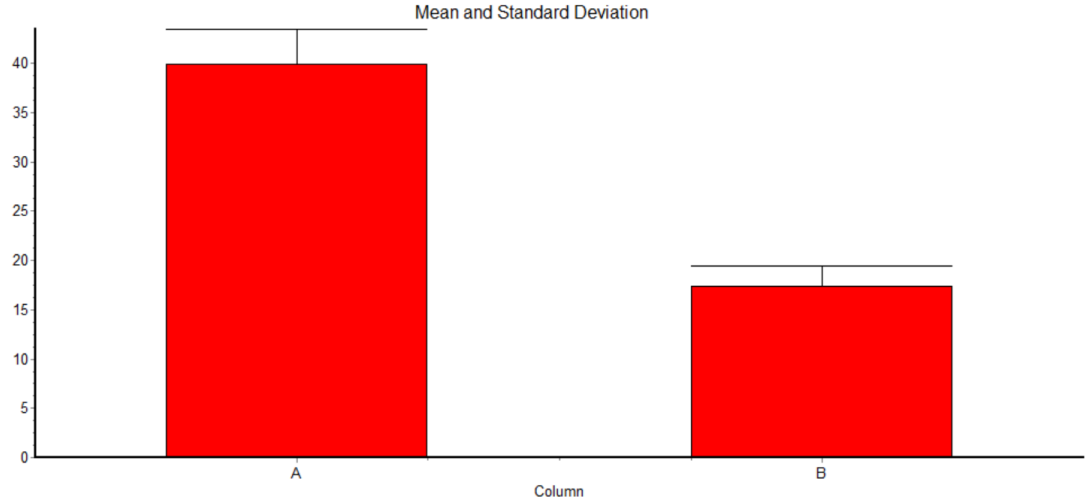
administered 10 times in a row,20 min total. At the last stage of actively rotating the neck, the patient used his own hand to make a passive rotation. After holding in the position of newly obtained painless range of motion for 2 sec, the glide should be maintained until the neck slowly returns to the original position (Mulligan 2010). This mulligan SNAG technique were applied to subjects with 3 sessions per week, each session is 20 min, for a period of 8 weeks.

Group B subjects are given with placebo effect of SNAG. Therapist front and side of the patient. The therapist did not apply any other techniques, but the contacting pressure of the hand, which was touching the dysfunctional joint. The therapist remained in the position for at least 10 sec. This treatment was administered 10 times repeatedly,20 min per performance. This treatment was administered three times per week, 20 min per performance, a total of 24 times in eight weeks.

Outcome measures: Subjects are assessed by using Numerical pain rating scale (NPR) for assessing neck pain, Neck disability index is used to evaluation of neck disability.

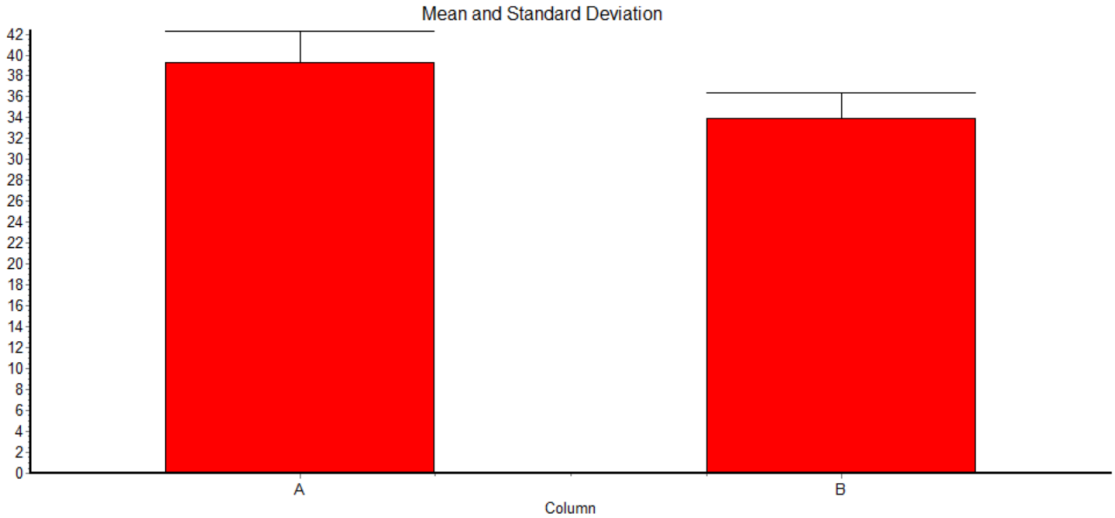
4. Result

Comparison of Pre and Post Values of NDI Scale in Group A



	Mean	Standard Deviation	p-value	t-value
Pre	39.9	3.573	<0.0001	17.240
Post	17.4	2.066		

Comparison of Pre and Post Values of NDI Scale in Group-B



	Mean	Standard Deviation	p-value	t-value
Pre	39.3	2.983	0.0004	4.377
Post	33.9	2.514		

5. Discussion

The present review provided data on the effectiveness of sustained natural apophyseal gliding technique on the neck pain and cervical range of motion in subjects with cervicogenic headache. The objective was to investigate the effects of this technique in patients with cervicogenic headache.

A total of 20 subjects with cervicogenic headache were included in the study and divided into two Groups, A and B, 10 in each group. Group A subjects are given sustained natural apophyseal gliding technique and group B are treated with placebo sustained natural apophyseal gliding.

This review revealed that Group A which is an experimental group shows improvements in subjects with cervicogenic headache. The group A show with p value <0.0001 suggesting that Sustained natural apophyseal gliding Technique is effective in reducing neck pain and improves cervical range of motion in subjects with cervicogenic headache.

According to Gate Control Theory, stimulation of mechanoreceptors within the joint capsule and surrounding tissues causes an inhibition of pain at the spinal cord. In case of the increase in cervical rotation range, mobilization most likely decreased joint stiffness, broke down adhesions and stretch surrounding tissues. However, immediately therapeutic effect suggest, that explanation of effectivity of this technique could be more related with a neurophysiological change in pain modulation.[9]

Akshay Pal, Anand Misra conducted a experimental study design on SNAG mobilization within the age limit 20 to 50 yrs of both male and female. Patients diagnosed with computer professionals with neck pain and mobility deficit of cervical movements. They concluded that patients innervated with SNAG mobilization with conservative treatment shows good results.[10]

ADHAM A. MOHAMED Determined the effect of C_1-C_2 SNAG moblisation on cervicogenic headache and assosciated dizziness on 48 patients. Concluded that the use of cervical SNAG mobilization is encouraged as a noninvasive intervention depending on the therapist assessment, findings, and clinical reasoning.[11]

Ian A Young used Neck disability index and numeric pain rating scale as outcome measures in patients with cervicogenic headache. They concluded that the Neck disability index exhibited excellent reliability while the Numeric pain rating scale exhibited moderate reliability.[12]

TOBY HALL conducted a randomized study on effect of C_1-C_2 self- sustained natural apophyseal glide on 32 patients with cervicogenic headache. Concluded that C_1-C_2 self-SNAG will decrease the pain and increase the range of motion in subjects with cervicogenic headache.[13]

6. Conclusion

Present review concluded that there is a significant improvement in pain reduction and increasing range of motion (evaluated by Neck disability Index) in both subjects with Cervicogenic Headache, who are trated with C_1-C_2 Sustained Natural apophyseal Gliding technique (Group A) and Placebo SNAG (Group B). Group analysis between two groups considered there is significant difference with p value, hence Sustained natural apophyseal gliding technique is effective in reducing neck pain and improve cervical range of motion.

7. Limitations

- Small sample size.
- Short duration study.
- Lack of follow up after study.

8. Recommendations

- Large sample size.
- Longer duration of study.
- Requires accurate data to follow up for generalizing the results.
- More outcome measures are required.
- Study should include every condition of cervicogenic headache.

Declaration by Authors

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