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Efficacy of the static isometric neck exercises and hold-relax (PNF) technique to relieve cervicogenic headache among college students: A comparative study

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Abstract---Introduction: The word cervicogenic headache is defined as “referred pain perceived in any part of the head caused by primary nociceptive source in musculoskeletal tissues innervated by cervical nerves”. Symptoms is usually unilateral and does not change its side, it begins in neck and spread to head. Pain, tenderness, stiffness, decreased range of motion etc, are the most common symptoms. Pain can range from dull, deep ache to heavy pressure of severe intensity. In India, college students aged between 17 years – 23 years suggested to have prevalence of about 15.6 % of likely having cervicogenic headache. Materials and Methodology: Physiotherapy College students having cervicogenic headache were included in the study. This is a study of assessment of pain, range of motion, cervical flexion rotation test among college students who have frequent cervicogenic headache. The study duration was about 3months including 80 sample size selected according to the inclusion and exclusion criteria. Results: Unpaired t test was done to compare different parameters in group A and group B. Paired t test was done in group A and in group B to compare pre and post intervention Conclusion: There was decrease in pain in both groups after intervention, patients from static isometric neck exercises and hold-relax [PNF] technique. In comparison of between the groups, it was found that pain was comparatively less in patients receiving static isometric neck exercises than patients receiving hold-relax [PNF] technique.

Keywords---cervicogenic headache, PNF technique, hold-relax technique, static neck isometric exercises, cervical flexion rotation test, visual analogue scale.

Introduction

Headache is the most common condition affecting many individuals. It is estimated that 90% of the population have experienced headache in their lives. Cervicogenic headache is a type of headache originating from the cervical spine. The word cervicogenic headache is defined as “referred pain perceived in any part of the head caused by primary nociceptive source in musculoskeletal tissues innervated by cervical nerves”. These structures may include muscles, nerves, facet joints, capsules, ligaments, spinal cord, vertebral artery. Pathology depends upon various anatomical structures for origination of such type of headache. Individuals with cervicogenic headache presents with some degree of variance in their complaints. Neck pain and cervical tenderness are the most prominent symptoms for the cervicogenic headache. Symptoms is usually unilateral and does not change its side, it begins in neck and spread to head. Pain, tenderness, stiffness, decreased range of motion etc, are the most common symptoms. Pain can range from dull, deep ache to heavy pressure of severe intensity. Referral pain patterns include symptoms in the occipital region, upper trapezius, scalene, sternocleidomastoid, levator scapule, pectoralis major and minor and the vertex of the head. The classification of cervicogenic headache and the other forms of headache are controversial as it depends on variable symptoms. The occurrence of the symptoms have been found 4 times higher in the individuals with musculoskeletal symptoms than those without it. It was originally consider that change in the vertebral artery flow may give rise to cervicogenic headache. It often worsen with the emotional stress, overuse of smart phones, prolong working hours using computers, in correct posture while prolong studying or reading sleep disturbance patterns, sleeping with sustained awkward postures. Recent studies have shown that cervical disorders are the known cause for the cervicogenic headache. International Headache Society have established criteria for cervicogenic headache.

- A. Pain is localized to the neck and occipital region and may project to forehead, orbital region, temples, vertex, and ears.
- B. Pain is precipitated or aggravated by special neck movements or sustained neck posture.
- C. atleast 1 of the following:
 1. Resistance to or limitation of passive neck movements.
 2. Changes in neck muscle contour, texture, tone, or response to active and passive stretching and contraction.
 3. Abnormal tenderness of neck muscles
- D. Radiological exam reveals at least 1 of the following:
 1. Movement abnormalities in flexion/extension
 2. Abnormal posture
 3. Fractures, congenital abnormalities, bone tumors, rheumatoid arthritis, or other distinct pathology except spondylosis.

Articles have shown that various symptoms such as muscle tightness, strength, endurance, impaired neuro-motor contract have been seen in the individuals with cervicogenic headache. Various physical approaches such as mobilisation, myofascial release, post-isometric relaxation technique, muscle energy technique and other surgical procedures are applied to relieve cervicogenic headache. Degenerative changes and disc of the cervical vertebra are seen in many

asymptomatic individuals. Degenerative changes also increases with advance age but have controversial discussion with chronic type of pain. Conservative management for cervicogenic headache have shown less effective for relieving such type of pain. Researchers have also performed pharmacological drugs, surgical procedures, anesthesia for symptomatic individuals but for the very short term efficacy. In India, college students aged between 17 years – 23 years suggested to have prevalence of about 15.6 % of likely having cervicogenic headache. Several studies shows medical college students between the 17-23 years aged group have demonstrated 41.4 % ratio suffering from cervicogenic headache. The purpose of the study was to compare the efficacy of the static neck isometric exercises and hold – relax [PNF] technique to relieve cervicogenic headache among college students. Pain intensity is used as main variable which has been used to test before and after the treatment. For the outcome measure Visual Analogue Scale [VAS] is used, which is the most reliable scale to mark the pain intensity for such type of the headache as well as for the other types of chronic pain. Other outcome measures such as Cervical Flexion Test and the Range Of Motion using goniometer has been used.

Materials and Methodology

Physiotherapy College students having cervicogenic headache were included in the study. This is a study of assessment of pain, range of motion, cervical flexion rotation test among college students who have frequent cervicogenic headache. This study was conducted in tertiary college. An ethical clearance certificate was obtained by Institutional Ethical Committee of KIMSDU/032022. An Assessment was performed using Universal Goniometre for Lateral Cervical Range of motion, Visual Analogue Scale, Cervical Flexion Rotation Test. Physiotherapy College students having cervicogenic headache were included in the study. This is a study of assessment of pain, range of motion, cervical flexion rotation test among college students who have frequent cervicogenic headache. The main share of the time was consumed on the data collection procedure. According to the parent article and from the approval given by the statisticians the sample size of 80 students were selected meeting the inclusion and exclusion criteria. All the students selected for the study have prior signed the information sheet, consent form in the Marathi and the English language which explains all the purpose and limitations of the study.

Inclusion criteria

Subjects who met the following inclusion criteria were asked to participate in the study:

1. Neck movements with sustained awkward head positioning.
2. Unilateral head pain without side shift or bilateral head pain with dominant side which has pain more than the other side.
3. Student with chronic neck pain with frequent cervicogenic headache.
4. Cervical flexion rotation test.
5. Both male and female.

Exclusion criteria

Subjects were excluded from participation if they had following condition

1. Fractures.
2. Previous surgery.
3. Disc prolapsed.
4. TMJ dysfunction.
5. Congenital condition of cervical spine such as spina- bifida, torticollis, scoliosis. The above mentioned inclusion and exclusion criteria was made using the established criteria made by International Headache Society for the cervicogenic headache.

Students were divided into two groups; Group A and Group B, each group having 40 students selected according to the inclusion and exclusion criteria.

The Static Neck Isometric Exercises were performed on the students in Group A with all the instructions given prior.

Cervical Flexion – Cervical Extension exercises.

Cervical Side Bending exercise.

Neck rotations.

Chin tucks.

Shoulder blade exercise.

The Hold –Relax [PNF] technique was performed on the students selected in Group B as follow: Neck flexion with rotation to the right.

Neck extension with rotation to the left

Participants willingly fill the data collection sheet and participated for the study and none of the participants was enforced to participate for the conducted study. Confidentiality was the main clause of the information sheet and the consent form. All the data of the participants were kept confidential. Appropriate time was given to each participants to read and fill the form.

Results

Unpaired t test was done to compare different parameters in group A and group B. It was found that:

- Mean age of group A patients was 20.9 years and group B was 21.4 years.
- Mean VAS on rest before intervention was 6.15 in group A and 5.95 in group B.
- Mean VAS on rest post intervention was 3.22 in group A and 3.67 in group B.
- Mean VAS on activity before intervention was 7.4 in group A and 7.15 in group B.
- Mean VAS on activity post intervention for group B 6.65 was significantly higher than group A 4.62 (p=0.0001)
- Mean ROM (Lat flexion Rt) before intervention was 13.4 in group A and 14.85 in group B.
- Mean ROM (Lat flexion Rt) post intervention for group B 19.02 was significantly lower than group A 25.2 (p=0.0001)

- Mean ROM (Lat flexion Lt) before intervention was significantly higher 14.9 in group A than 13.52 in group B ($p=0.042$).
- Mean ROM (Lat flexion Lt) post intervention was significantly higher 28.02 in group A than 18.32 in group B ($p=0.0001$).

Paired t test was done in group A and in group B to compare pre and post intervention. It depicted that:

In group A

- Mean VAS on rest before intervention 6.15 was significantly higher than post intervention 3.22 ($p<0.0001$).
- Mean VAS on activity before intervention 7.4 was significantly higher than post intervention 4.62 ($p<0.0001$).
- Mean ROM (Lat Flexion Rt) before intervention 13.4 was significantly smaller than post intervention 25.2 ($p<0.0001$).
- Mean ROM (Lat Flexion Lt) before intervention 14.9 was significantly smaller than post intervention 28.09 ($p<0.0001$).

In group B

- Mean VAS on rest before intervention 5.95 was significantly higher than post intervention 3.67 ($p<0.0001$).
- Mean VAS on activity before intervention 7.12 was significantly higher than post intervention 6.65 ($p<0.0001$).
- Mean ROM (Lat Flexion Rt) before intervention 14.85 was significantly smaller than post intervention 19.02 ($p<0.0001$).
- Mean ROM (Lat Flexion Lt) before intervention 13.52 was significantly smaller than post intervention 18.32 ($p<0.0001$).

Discussion

Headache is the most common condition affecting many individuals. It is estimated that 90% of the population have experienced headache in their lives. Cervicogenic headache is a type of headache originating from the cervical spine. More recurrence of cervicogenic headache among youngsters has become common and unnecessary exposure to X – Ray should be avoided in young age. The vast majority of people are still developing countries have been the victims of various forms of headache and neglect that. Many things play an important role during the illness period from diagnosis to treatment. (1)

Clinical practice guidelines for treating cervicogenic headache be improved 2-5 but unfortunately developing countries need resources and clear guidelines for following these guidelines. The current study focuses on this cervicogenic headache management an integrated approach. A sample of human age which means it was 21.15 years to show that students included in their early thirties are more prone to growth cervicogenic headache due to many factors like working, a sedentary lifestyle, awkward postures while using cell phone etc.

CGHs also present with certain co-morbidities as cervical spondylosis, sleep disorders, anxiety and panic attacks, experiencing menstrual abnormalities, hypertension. Doctors often measure active cervical ROM patients with headache and neck pain; other writers Reported a sharp decline in performance ROM, 6-7 while others found nothing important difference in AROM compared to seamless studies.8-9 Findings supported results of previous studies carried out internationally.

There was decrease in pain in both groups after intervention, patients from static isometric neck exercises and hold-relax [PNF] technique. In comparison of between the groups, it was found that pain was comparatively less in patients receiving static isometric neck exercises than patients receiving hold-relax [PNF] technique. Range of motion was comparatively high in patients receiving static isometric neck exercises than patients receiving hold-relax [PNF] technique. No. of patients having negative cervical flexion rotation test post intervention were significantly higher in patients from both groups. But, no. of patients having negative cervical flexion rotation test post intervention in patients receiving static isometric neck exercises (87.5%) were significantly higher.

A systematic review of randomized controlled trials using manual therapy for CGH patients suggested better outcomes compared with no treatment, 10-11 despite the need for advanced clinical studies 12. Both combination and manipulation are effective in treating patients with cervical pain, although manipulation 13-14 appears superior to mobilization in the short term. Unfortunately, there are a few studies that focus on the symptoms of dizziness and nausea in patients with CGH. With this lack of direct evidence and until further notice, physicians can make clinical decisions based on research performed on patients with chronic neck or head pain.

Effective, conservative pain management is very important to our patients. Studies have shown a positive effect on the combination of a stretching program that is often overlooked by local physiotherapists, although electrotherapy and medication are important in pain management but play a supportive role only as concluded in this study. It is recommended that this method be used regularly to achieve long-term quality care

Neck pain, stiffness, headache on one side or may be on both sides is most common in students. This may be due to disturbed sleep, awkward position while reading, writing or incorrect posture. Effective, conservative pain management is very important to our patients. Studies have shown a positive effect on the combination of a stretching program that is often overlooked by local physiotherapists, although electrotherapy and medication are important in pain management but play a supportive role only as concluded in this study. In group A, we have given static neck isometric exercises which can be performed with the help of physiotherapists as well as without assistance or any supervision and in group B Hold relax (PNF) technique, therapist is always needed to perform. But as group A significant results are obtained as compared to group B, it is recommended that this method be used regularly to achieve long-term quality care.

Conclusion

There was decrease in pain in both groups after intervention, patients from static isometric neck exercises and hold-relax [PNF] technique. In comparison of between the groups, it was found that pain was comparatively less in patients receiving static isometric neck exercises than patients receiving hold-relax [PNF] technique. Range of motion was comparatively high in patients receiving static isometric neck exercises than patients receiving hold-relax [PNF] technique. No. of patients having negative cervical flexion rotation test post intervention were significantly higher in patients from both groups. But, no. of patients having negative cervical flexion rotation test post intervention in patients receiving static isometric neck exercises (87.5%) were significantly higher.

In group A, we have given static neck isometric exercises which can be performed with the help of physiotherapists as well as without assistance or any supervision and in group B Hold relax (PNF) technique, therapist is always needed to perform. But as group A significant results are obtained as compared to group B, it is recommended that this method be used regularly to achieve long-term quality care. It is recommended that further research be conducted on a larger scale that includes more patients and longer follow-up. Much work needs to be done in classifying the process to evaluate its outcomes as a successful intervention.

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