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TO STUDY THE EFFICACY OF MCKENZIE TREATMENT, ISOMETRIC STRENGTHENING EXERCISE AND HOT PACK IN THE TREATMENT OF NECK PAIN.

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ABSTRACT

A sample of 60 subjects were taken in this study on the basis of inclusive and exclusive criteria . The subjects were explained about the purpose of the study and informed consent was taken from the subjects and also from the attendees. The total subjects divided into three groups A, B and C, in which each groups have 20 subjects. The Group A subjects were received McKenzie treatment, Hot Pack and Postural Correction. The Group B subjects were received Strengthening exercise. Hot Pack and Postural Correction. The Group C subjects were received Hot Pack and Postural Correction. All three groups were treated for four weeks. VAS and FRI were taken for all the subjects before starting the study. Post hoc analysis using Turkey HSD was used for pair wise comparison of VAS and FRI at 0, 1, 2, 3 and 4 weeks between the 3 groups. The significant level of this study was 0.05

Key Words

VAS Score , FRI , McKenzie treatment

Introduction

Neck pain is one of the most common persisting symptoms in the general populations within estimate lifetime prevalence of 67% among adults of age group 20 to 69 years. Limited range of motion and a subjective feeling of stiffness may accompany neck pain, which is often precipitated or aggravated by neck movements or sustained neck postures. Headache, brachialgia, dizziness and other signs and symptoms may also be present in combination of neck pain.²² Neck pain arises from habitual postures referred as non specific neck pain. Several authors proposed that non specific neck pain problems results from poor posture in terms of sustained long-term abnormal physiological loads on the neck.³ Instability is one element of cervical pain and may contribute to the clinical presentation of various conditions including cervicogenic headache, chronic whiplash dysfunction, rheumatoid arthritis, osteoarthritis and segmental degeneration^{3,38}. In neck pain conservative treatment methods are frequently used in general practice include Analgesic, rest or referral to a physical therapist or manual therapist, Physical therapist may include passive treatment such as massage, interferential current or heat application and active treatment such as exercise therapies.²² The McKenzie method was introduced in Sweden in 1985 and came to be frequently used in the 1990 as a treatment modality for patients with mechanical problems of the spine. Today, physiotherapists in primary care often employ this procedure as both as

diagnostic tool and a treatment model. A randomized clinical trail involving patients with neck pain and comparing treatment effect of the McKenzie method, General exercise and Ultrasound They found that McKenzie treatment is more favourable than other¹. The McKenzie protocol has been commonly used in low back conditions may also be employed in the treatment of mechanical neck pain in three syndromes as Postural, Dysfunction and Derangement. Postural Syndrome is caused by mechanical deformation of soft tissue, as a result of certain postural stresses. The treatment is correction of posture. The dysfunctions syndrome is caused by adaptive shortening of certain structure due to poor posture habits. The treatment is stretching shortened structures and postural correction. The derangement syndrome defined as change in the position of the intervertebral discs and alters the position of two adjacent vertebrae. It is treated by neck retraction exercise.^{2,39,41} Patient with neck pain may have reduced neck strength in flexion, extension and rotations. Neck strength in all directions was significantly lower in patient with neck pain. Some study reports on the responses to specific strength training of the extensor, flexor and rotator muscles of the neck.¹⁵ Highland and Dreisinger et al⁵⁵ performed a study on changes in isometric strength and range of motion of the cervical spine after eight weeks of clinical rehabilitation. They found that all groups showed significant gain in average strength, range of motion and decreased pain. Alan Jordan et al¹¹ done treatment included a combination of active and passive elements. The passive elements

were Hot Pack for a duration of 20 minutes, massage, continuous US (3 w/cm² for 5 minutes) and manual traction. The active element included instruction of the home exercise program. The treatment protocol was given for six weeks. They found that self reported improvements for pain and disability show approximately 50% reduction. Nwuga and Nwuga et al³⁹ compared the McKenzie approach to Williams approach to determine which was effective in decreasing pain and restoring spinal range of motion in patients with low back pain. They concluded that the McKenzie approach was more effective in decreasing the patient's level of pain and in restoring range of motion. Stankovic and Johnell et al⁴⁰ compared the effect of the McKenzie method of treatment with patient education in mini back school in patient with low back pain. They concluded that treatment according to McKenzie principal was superior to mini back School.

The McKenzie treatment is effective on both low back pain and neck pain. Several studies have been done to prove the individual effect of McKenzie, Hot Pack and strengthening exercise in both low back pain and neck pain. But none of study has been done to prove which one is more effective so the need arises to see the comparative effect of McKenzie, Strengthening Exercise and Hot Pack.

METHODOLOGY :

A convenience sample of 60 subjects with neck pain was solicited from the physiotherapy department of govt hospital . The total subjects divided into three groups A, B and C, in which each groups have 20 subjects. In group A

subjects with mean and standard deviation of age, height and weight were 30.7±3.3 Years, 169.2±5.2 cms, 67.±6.5 kg respectively, group B subjects were 32.5 ± 4.5 Years, 162.9 ± 12.2 cms, 63.6 ± 9.0 kg respectively and group C subjects were 32.4 ± 5.4 Years, 168.6 ± 48 cms, 66.73 ± 8.3 kg respectively. The mean and standard deviation of VAS score (before treatment) for group A, B and C were 5.73 ± 0.88, 5.60 ± 0.98 and 5.60 ± 0.98 respectively. The mean and standard deviation of FRI score for group A, B and C (before treatment) were 48.86 ± 7.46, 50.60 ± 7.90 and 50.20 ± 7.66 respectively.

Inclusion Criteria

1. Patient with neck pain (duration two month or more) with or without radiation.
2. Age Group 25-50 years.
3. Weight 50-80 kg.
4. Atraumatic origin.
5. VAS: 4-7
6. FRI: 40-70%

Exclusion Criteria

1. Subjects with a history of severe trauma such as fracture.
2. Congenital disorder of cervical spine.
3. Patient with neurological deficit.
4. Spondylolisthesis.
5. Tumour.
6. Spinal Surgery.
7. Pott's spine.
8. Rheumatoid Arthritis Disorder.
9. Ankylosing Spondylosis.
10. Vertebro-Basilar Insufficiency.
11. Cardiac Problem.

Study Design

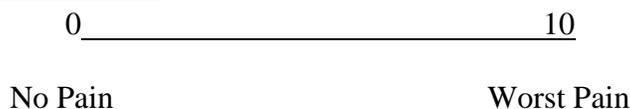
It is an experimental study design. Subject with neck pain randomly assigned into three group viz group A, B and C. The

Group A subjects were received McKenzie treatment, Hot Pack and Postural Correction. The Group B subjects were received Strengthening exercise. Hot Pack and Postural Correction. The Group C subjects were received Hot Pack and Postural Correction. All three groups were treated for four weeks.

VAS has been shown to be effective and reliable instrument for measuring patients interpretation of pain. Patient using 0-10 cm horizontal scale has measured pain intensity, in which 0 indicate no pain and 10 indicate worst pain. VAS provides a reliable, responsive measurement and was easy to understand.

Example of VAS

Instrumentation for Data Collection
Visual Analogue Scale (VAS)



Functional Rating Index (FRI)

FRI has been designed to show clinical change in conditions affecting the spine, whether cervical, thoracic or lumbar, in other words it is reliable instrument to measure the magnitude clinical changes in spinal condition. In

order to properly assess the patient condition, FRI has been marked from 10% to 100% on scale line, which show the ability of patients to manage everyday activities.⁵

To calculate

$$\text{Score} = \frac{\text{Total score of 10 items}}{40} \times 100$$

Hot Pack

Hot Pack consists of a silicate gel such as bentonite, enclosed in a cotton fabric container. This gel will absorb large quantities of water which is hot provides a considerable store of heat energy. These packs are made in various size to fit

different body areas. E.g.. cervical packs, lumbar packs etc. They are heated by placing in a special tank of water warmed to 75-80°C by an electric heater controlled by thermostat.³

Fig. 3.1: Hot pack machine**Fig. 3.2: Hot pack for neck region**

Protocol

The study made of 60 subjects who were randomly divided into three group A, B & C. Prior to participation all subjects were informed about the study and an informed consent was taken. VAS and FRI were taken for all the subjects before starting the study. The Group A subjects were received McKenzie treatment, Hot Pack and Postural Correction. The Group B subjects were received Strengthening exercise, Hot Pack and Postural Correction. The Group C subjects were received Hot Pack and Postural Correction. All three groups were treated for four weeks.

Procedure

McKenzie Exercise

McKenzie exercise is one of the numerous technique used by physical therapists to assess and treat patients. McKenzie exercise is used in the form of neck retraction exercise. The patient is instructed to move the head backwards as far as possible but at the same time

maintain forward facing position. It is important that the movement is made to maximum. On completion the patient returns to the neutral rest position. The movement is done for four sets of 10-15 repetitions with 1-2 minutes rest between each set.

First Week

The patient was lying in supine position, chin was tucked in or head was retracted. A small pillow was used under the occiput to maintain slight flexion. The patient was asked to pull his head and neck posterior into a position in which head was directly over the shoulder girdle. The end position was maintained for one second and then allowed to relax into a resting posture. This procedure was done for 4 sets of 10 to 15 repetitions and 1 to 2 minutes rest between each set.

Second Week

In sitting position, progression was given by the addition of neck extension

with chin tucked overpressure in the end range of motion by the therapist. This procedure was done for four sets of 10 to 15 repetitions and 1 to 2 minutes rest was given in between each set.

Third Week

In supine lying, head was kept out of the couch. The retraction and extension exercise was performed with traction by the therapist. The traction and extension was maintained throughout the range of motion.

Fourth Week

The patient was asked to come in sitting, progression was done by addition of first retraction with lateral flexion, then neck rotation, and finally combined retraction and neck flexion with overpressure performed by therapist. This procedure was done for four sets of 10 to 15 repetitions and 1 to 2 minutes rest was given in between each set¹³.



Fig. 3.3: Neck extension exercise with chin tucked in sitting position



Neck extension and retraction exercise with traction of neck in supine position



Isometric Strengthening Exercise

The patient was in sitting position. These were initially done with the neck in neutral posture and with a therapist resisting flexion, extension, lateral flexion and rotation by the therapist. Contractions were held for 5 second/repetitions and repeated 10 times, with 3 seconds rest in between them. These exercises were done for 2 sets with 1 to 2 minutes rest in between each set. Placement of therapist hand for each movement is as follow:-

(i) Flexion:- The therapist placed his hand on the forehead of patient and the patient was asked to press the forehead

into the palms of the therapist in a nodding fashion.

(ii) Side Flexion :- The therapist placed his one hand on the side of the patient's head and the patient was asked to press the therapist hand in a side flexion fashion.

(iii) Extension:- The therapist placed his one hand on the back of the patient near the top of the head. The patient was asked to press the head on the therapist hand.

(iv) Rotation:- The therapist placed one hand against the region just superior and lateral to the eye. The patient was asked to turn the head to look own shoulder.

Isometric exercise for flexion in sitting



Isometric exercise for extension in sitting position



Isometric exercise for flexion in sitting position



Application of hot pack in neck region



Hot Pack

The position of the patient was supine lying the hot pack was wrapped in towel with thickness of about 6-8 layers before being applied to the neck area. The hot packs were stored in hot water kept at about 72-75° C (158° 167° F) inside a thermostatically controlled hot pack containers. The hot pack was initially heated for two hours and 30 minutes reheated between each use. Lachmann et al (1996) State that after 8 minutes application of hot pack the skin temperature was reached its maximum. The pack was left in place for 20 minutes. 14,55

Postural Correction

The patients in all groups were given postural correction and postural awareness as home program. The postural correction was recommended as axial extension or neutral neck position. These were done to correct neck position for patients with neck pain and spasm of upper trapezius. The

postural awareness program consists of the following points.

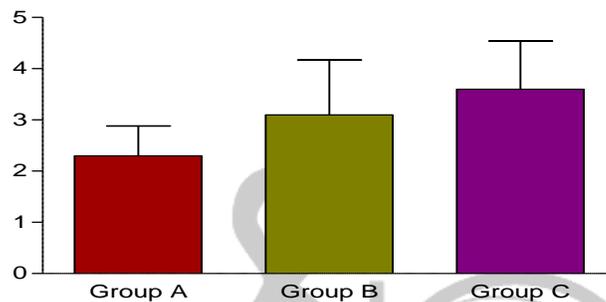
Reading Posture

1. Neck should not be kept in one position for prolong time.
2. Adjust the height of reading table such that the books are at the level of eyes and arms are comfortably place. Avoid slouching lower back and shoulders. Sit tall with whole back against chair back and head erect.
3. Computer and TV screen should be at proper height and distance. Position & height of monitor should be within 20°

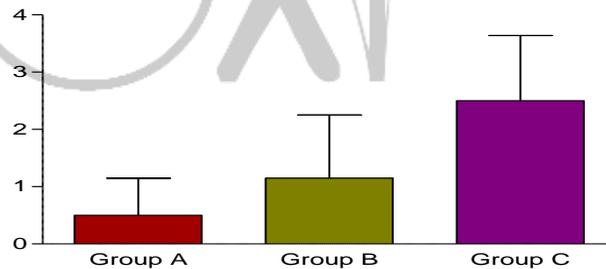
Sleeping Posture

1. Avoid big pillows they make neck rest higher than body causes it to bend forward.
2. Use pillows of adequate height that aligns the head and neck at the same level of body. The pillows should support the head and neck fully and should extend up to shoulders.

Comparison of mean values of VAS 2 among Group A , Group B and Group C



Comparison of mean values of VAS4 among Group A, Group B and Group C



DISCUSSION : The McKenzie method of treatment was more effective or successful than isometric strengthening exercise and hot pack in control group with a more rapid improvement in pain intensity during third and fourth week. The purpose of this study was to find-out whether any clinically observable improvement in neck pain, occurs after performance of McKenzie exercise in comparison to other isometric

strengthening exercise and hot pack in control group. The present study that the McKenzie treatment is effective in improvement of neck pain after a rehabilitation protocol of four sets of 10-15 repetitions per day for four weeks in comparison to other groups, which had followed the other protocol. Clinically, McKenzie method of treatment i.e. neck retraction exercise were used to decrease

or centralize a patient's pain and to help the improvement of individual neck posture. According to McKenzie, patient in whom pain decreases and pain centralizers as a result of performing neck retraction are classified as having posterior or postero lateral disc derangement. Sundeep Rathore et al² - McKenzie postulated that neck flexion would cause a movement of the nucleus pulposus to a more posterior position due to increase mechanical compression on the anterior surface of the intervertebral disc that increase peripheral pain and nerve root compression. But McKenzie has advocated neck retraction, causes extension of the lower cervical segments and may elevate stress on the posterior annulus and thereby relieve pain. If patient with neck pain and radicular pain, repeated neck retraction results in decreased peripheral pain and nerve root compression. The McKenzie method of treatment has been successful in the treatment of neck pain in short term. Karas et. al²⁷ found that 73% of their patients showed centralization of symptoms during the first or second visit. Sufka et al⁵⁶ analyzed a small cohort of patients, reported a complete centralization occurrence rate of 83% in patients with neck pain. But there were symptomatic reduce in radicular pain reporting a centralization occurrence rate of 85% in patients with acute pain. G. Kjellaman and B. Oberg et al¹ McKenzie treatment was more favourable than general exercise and the ultrasound in control group, with a more rapid improvement in neck pain intensity during the first 3 weeks. Chukuka S. Enweneka et al⁶- Neck pain is often accompanied by

protective muscle spasm which developed pressure within the homonymous muscle, thus producing ischemia, more pain and abnormal neck posture. They showed that postural correction was more effective in reducing neck pain and muscle spasm other studies have showed that spasm of the sternocleidomastoid and perhaps temporomandibular pain may be reduced by postural correction. Donelson et al²⁷ study showed that 91% of the patients with acute pain in whom symptoms centralized as excellent outcomes with relief of pain and full functional recovery. Thomas R. Highland and Dreisinger et al⁵⁵ studied the changes in isometric strength and range of motion of the isolated cervical spine after 8 weeks of clinical rehabilitation. They found that all group showed significant gain in average strength, range of motion and decreased pain. Alan Jordan et al¹¹ treated the neck pain with combination of active and passive elements, included in the passive elements were hot packs for duration of 20 minutes, massage, continues ultrasound (3 W/cm² for 5 minutes) and manual traction. Active therapy included instruction in the same home exercise program. They showed approximately 50% reduction of neck pain in all groups. In my study there was significant reduction of neck pain and radicular neck pain through McKenzie treatment within the groups. The group A showed more improvement than other group B and group C.

Future Research

Future research can be carried out with increased number of patients to analyze the effectiveness of McKenzie protocol.

The future research can also be carried out with increased duration of treatment protocol and increased VAS (Visual Analogous Scale) and FRI (functional rating index).

Relevance to Clinical Practice : The present study proved that the McKenzie protocol is more successful than isometric exercise and control group, so we can apply the McKenzie protocol to the patient having neck pain in clinical practice. McKenzie protocol (neck retraction) that causes extension of the lower cervical segments and may elevate stress on the posterior annulus and thereby relieve pain. In patients with neck pain and radicular pain, repeated neck retraction is shown to result in a significant decrease in peripheral pain and decreased nerve root compression.

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ETHICAL CLERENCE: It is bonafied work done by me and I have not taken any part of thesis from any where.

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