



Research Article

EFFECTIVENESS OF KENDALL EXERCISES VERSUS PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION STRETCHING EXERCISE ON MECHANICAL NECK PAIN IN MIDDLE AGE PEOPLE – A EXPERIMENTAL STUDY

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A B S T R A C T

Background: Mechanical neck pain is the most common type with pain confined in the posterior aspect of neck. Mechanical neck pain affects 45-54% of the general population. Neck pain is most usual in people with an employed age group of 20-50 years and people employed in various jobs at a desk with neck bent forward posture. Persistent pain, disability, and motor dysfunction are common complications associated with neck pain.

Methodology: Samples of Eighty (n=60) mechanical neck pain People in aged of 30-50 years were included in the study. The subject who met the inclusion criteria was included in the study. Subjects were divided into 30 in each group. Duration of treatment was done 30 minutes for 3 days per week for 8 weeks. Outcome measure were taken on the 0 day and on the last day of the treatment. Evaluation is taken before start of the treatment and at the end of the treatment with the use of Neck disability index and visual analog scale.

Results: There is significant difference in means of Pre-intervention and Post-intervention NDI, VAS Group A and group B with P<0.001

Conclusion: Kendall exercises and Proprioceptive Neuromuscular Facilitation stretching exercise both are effective in decreasing pain and disability on mechanical neck pain in middle age people after 8 week treatment. But Group B proprioceptive neuromuscular facilitation stretching showed more effective in reduced pain and disability on mechanical neck pain in middle age people.

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INTRODUCTION

Neck pain is a common complaint in general population. Mechanical neck pain is the most common type with pain confined in the posterior aspect of neck. Mechanical neck pain affects 45-54% of the general population^(1, 2)

Its prevalence is even higher in women (22%) than in men (16%). Persistent pain, disability, and motor dysfunction are common complications associated with neck pain³.

Neck pain is most usual in people with a employed age group of 20-50 years and people employed in various jobs at a desk with neck bent forward posture.^(1, 5)

Non-specific neck pain is described as mechanical pain detect anywhere between the occiput and upper thoracic spine and nearby muscles without any certain etiology. The International Association for the Study of Pain (IASP) has defined neck pain as: "Pain perceived as upper from anywhere within the region bounded superiorly by superior nuchal line, inferior by an unoriginally transverse line through the tip of first thoracic spinous process, and laterally by sagittal plane tangential to

the lateral border of neck. A often seen cause of the neck pain is uncomfortable occupational postures, heavy lifting and physically demanding work⁶.

Mechanical neck pain is as well as nonspecific neck pain has a terrible or unexpected onset of pain. Neck pain can be split into upper cervical segment pain in which the pain is usually referred to the head and lower cervical part pain in which the pain is referred to scapular region, shoulder, and upper limb.^{1, 7} The annual generality of mechanical neck pain ranges in industrial countries from 27% to 48%. Generality is high in middle aged people. In the seniority of cases, the pathologic basis for the neck ache is unclear and the complaints are labeled as nonspecific or mechanical. Precise prognosis by clinical examination is difficult because feature is frequently nonspecific.⁸

Mechanical neck ache generally seen in people elaborate in occupation like computer processing, clerical job, students and people with sedentary life style awkward occupational posture, heavy lifting and physically work. In a wrong working position, neck extensor muscles would be unnecessarily stretched during a prolong period of working

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with forward position of head and neck. Postural muscles have a tendency to get shortened, hyper tonus, spasmodic and altered proprioceptive input. Therefore regular cause of neck ache is muscle tightness in both normal and pathological conditions. Most habitual muscle is upper trapezius and levator scapulae⁸.

Mechanical neck ache can also result in referred pain to unilateral upper limb. A survey found that 67% of patients with associated upper limb ache without neurological deficit.⁹ Kendall exercise is commonly used as physical therapy for FHP and prompt proper neck positioning commonly using strengthening technique for two muscles (deep cervical flexors and retractors of the scapula) and stretching technique for two muscles (neck extensor muscles and pectorals). Normal Kendall exercise requires accurate movements but incorrect posture only has a bad influence on the spine¹²

Proprioceptive neuromuscular facilitation (PNF) is one of the therapeutic exercises this may help to better the outcome of the muscles and tendons by stimulating the proprioceptive sense, which enhances muscle strength, flexibility and balance. It is regularly used in therapeutic exercises as a continuous resistance for Functional training, improve limited ranges and to strengthen the muscles.¹³

Proprioceptive Neuromuscular Facilitation (PNF) requires stretching, resisted movement, traction and estimate to improvement muscle decline, atrophy and joint movement limitation. It is actual effective in improving flexibility, strength and range of motion.⁸

PNF stretching is the promote forms which can be applied to any tightened Muscle to lengthen Hold relax, contract relaxes, agonist contract etc. Are various forms of PNF stretching different studies have demonstrated that various PNF Stretching methods effectively increase flexibility and range of motion¹

METHODOLOGY

A single-blinded systematic randomized study was conducted at the outpatient unit in the physiotherapy department of Parul University. It is an experimental study design. The study was approved by the Institutional Ethical Committee of the (PU/IECHR/PIMSR/00/81734/2506) Parul University institutional ethics committee for human research (PU-IECHR). 60 subjects with mechanical neck pain were evaluated. Subjects aged between 30- 50 years and suffering from mechanical neck pain was included in the study. Both male and female subjects were included in the study. Participants were excluded based on the criteria like neck or upper back injury in last 6 months, patients suffering from giddiness or vertigo and frequent migraine, neck surgeries, Any neurological disorders, Mentally and physically disabled patient, Radiculopathy to the arm and upper extremity, Nerve root involvement, Pregnancy.

The sample size was determined based on the prevalence and 2 –tailed. Sixty subjects met the criteria. Written informed consent was obtained from all the subjects, and the procedure was explained to all participants by the principal investigator. Sixty subjects were enrolled for the study based on selection criteria. They were randomly allotted to two groups using a simple random method, where the principal investigator randomly allocated samples before baseline assessment.

Before the interventions, the subjects were assessed for their pain level, using visual analogue scale and neck disability measure using neck disability index score.

Group a received Kendall exercises and Group B received proprioceptive neuromuscular facilitation stretching exercise. Both the groups received treatment for 30 minutes of mechanical neck pain.

Group A: Kendall exercise

The Kendall exercise was given for 30 min.

12 repetitions, each taking 30 seconds.

The Kendall exercise methods were as follows:

1. Strengthening the deep cervical flexors, lying flat on the back with the chin down and then elevating the head and allotment this position for 2–8 seconds to make stronger deep cervical flexors;
2. Stretching the cervical extensors, placing both hands on the occipital area in a sitting situation monitored by a flexed neck posture with the head down to stretch the cervical extensors;
3. Strengthening shoulder retraction, placing a thera band around a protected object and pulling the band back with both hands as far as conceivable to move the shoulder blades near each other in a standing position; and
4. Stretching the Pectorals muscle, assigning both hands on the occipital area and pulling the elbows back up (bilateral) and performance arm abduction and external rotation (unilateral).

Group B: Proprioceptive neuromuscular facilitation stretching exercise

Exercise period: 30 minutes /session.

10 repetitions in each time, each exercise lasted 10 sec of rest will be given for patients between each repetition.

PNF techniques methods:

The following movement patterns will be performed.

- Head and neck flexion with rotation to right.
- Head and neck flexion with rotation to left.
- Head and neck extension with rotation to right
- Head and neck extension with rotation to left.

Head and neck flexion with rotation to right

The subjects were prepared to sleep supine with head & neck out of the plinth. They were examined to keep their head in extension and neck with rotation to left.

Therapist was positioned in standing, with one hand on the occiput and another hand on mandible.

The commands were given as “Pull your chin up towards the sternum”. The movement occurs as flexion of Head & neck with rotation to the right with normal timing.

Facilitation occurred through appropriate verbal commands and manual contact.

Head and neck flexion with rotation to left

The subjects were prepared to sleep supine with head & neck out of the plinth. They were examined to keep their head in extension and neck with rotation to right.

Therapist was positioned in standing, with one hand on the occiput and another hand on mandible.

The commands were given as “pull your chin up towards the sternum”. The movement occurs as flexion of head & neck with rotation to the left with normal timing.

Facilitation occurred through appropriate verbal commands and manual contact.

Head and neck extension with rotation to right

The subjects were prepared to sleep supine with head & neck out of the plinth. They were examined to keep their head in flexion and neck with rotation to left.

Therapist was positioned in standing, with one hand on the occiput and another hand on mandible.

The commands were given as “pull your chin downwards away from the sternum”. The movement occurs as extension of head & neck with rotation to the right with normal timing. Facilitation occurred through appropriate verbal commands and manual contact.

Head and neck extension with rotation to left

The subjects were prepared to sleep supine with head & neck out of the plinth. They were examined to keep their head in flexion and neck with rotation to right.

Therapist was positioned in standing, with one hand on the occiput and another hand on mandible.

The commands were given as “pull your chin downwards away from the sternum”. The movement occurs as extension of head & neck with rotation to the left with normal timing.

Facilitation occurred through appropriate verbal commands and manual contact.

Outcome Measures

1. Neck Disability Index for functional impairment.
2. Visual Analog Scale for pain.

Statistical Analysis

Statistical Methods

Descriptive statistical analysis was carried out in the present study. Out Come measurements were measured using visual analogue scale & neck disability index Significance was assessed at 5% level of significance p<0.005 (2-tailed hypothesis test considered).

Statistical tests

Paired ‘T’ test as a parametric was used for analysis of visual analogue scale & neck disability index variables within the Group A & Group B with design of percentage of modification.

Statistical software

The Statistical software specifically SPSS 2.1.0.1 was used for the investigation of the data and Microsoft word and Excel was used to generate graphs, tables etc.

RESULTS

Figure 1 shows the profile of the study. We assessed 60 subjects for inclusion and exclusion criteria. Sixty participants were selected and were grouped under group A and group B.

The baseline characteristics such as gender of the subjects of both the groups are represented in Table 1.

GENDER	GROUP-A	GROUP-B
FEMALE	20	19
MALE	10	11

Table No 2 Represents Inter Group Comparison For Vas (Independent T- Test)

Group	Mean ±SD	T value	P value
Group A	1.27±0.828		
Group B	2.53±0.900	-5.676	0.000

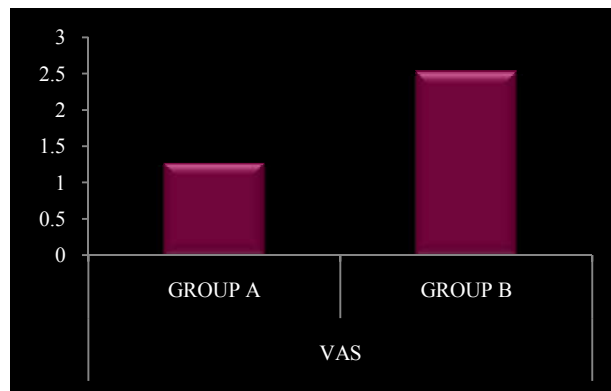
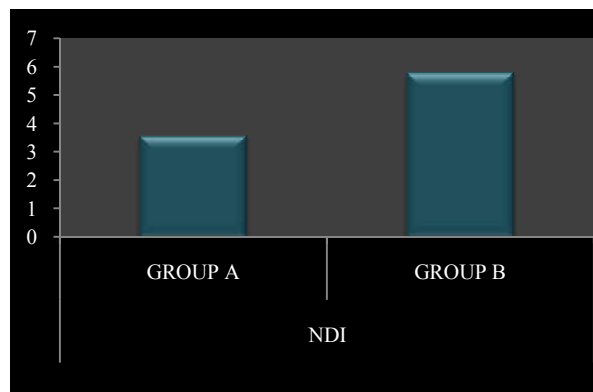


Table No 8 Represents Inter Group Comparison For Ndi Independent T- Test)

Group	Mean ±SD	T value	P value
Group A	3.57±2.208		
Group B	5.80±2.074	-4.038	0.000



DISCUSSION

In this study to examine the effectiveness of Kendall exercises versus proprioceptive neuromuscular facilitation stretching exercise and to make the comparison between the two exercise groups as a method to reduce pain and disability.

Here 60 individuals were recruited for the study with 30 in one Group (Group A) and 30 in other Group (Group B) having age in Group A=30-33 (11), 34-37 (9), 38-41(4), 42-45 (4),46-49(2) and Group B= 30-33 (9), 34-37 (6), 38-41(7), 42-45 (7),46-49(1).

Result of present study showed positive finding with clinically and statically important decrease in pain and disability in Group B more than Group A.

Group a participants were given Kendall exercises while Group B participants were given proprioceptive neuromuscular facilitation stretching exercise.

In this study two outcome measures were taken for pain and disability. As a first outcome, visual analogue scale measured pain during mechanical neck pain. Before the intervention mean value for Group A was 1.27 and for Group B it was 2.53 with the SD of ± 0.828 and ± 0.900 respectively which means subjects had mechanical neck pain. Though, after receiving intervention VAS is decreased in Group B. This shows that Group B were more effective related to Group A which is evident in table 7 and Graph-7.

Second outcome, NDI measured disability during mechanical neck pain. Before the intervention mean value of NDI for Group A was 3.57 and for Group B it was 5.80 with the SD of ± 2.208 and ± 2.074 respectively which means subjects had mechanical neck pain. Though, after receiving intervention NDI is reduce disability in Group B more than Group A. This shows that Group B were more effective related to Group A which is evident in table-8 and Graph-8.

This study rejects the null hypothesis — There is no between the effectiveness of Kendall exercise with PNF stretching exercise on pain and disability in mechanical neck pain and accept the experimental hypothesis — There is significant difference between the effectiveness of Kendall exercise with PNF stretching exercise on pain and disability in mechanical neck pain.

CONCLUSION

From the present study it can be concluded that Kendall exercises and Proprioceptive Neuromuscular Facilitation stretching exercise both are effective in decreasing pain and disability on mechanical neck pain in middle age people after 8 week treatment. But Group B proprioceptive neuromuscular facilitation stretching showed more effective in reduced pain and disability on mechanical neck pain in middle age people. Comparison of pre and post treatment score of mechanical neck pain shows that p value is <0.05 for NDI and VAS.

Source of Finding: self

Conflict of interest: None

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