

Mckenzie Protocol- A Modalities To Treat With Mechanical Cervical Spine

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Abstract: *Introduction: Neck pain or cervical pain is a common musculoskeletal disorder associated with degenerative processes in muscle, connective tissue, and nerve tissue. The clinicians assess the associated impaired function in neck pain patients. There is a lack of clarity in the superiority of the specific application of various exercise protocols. McKenzie protocol is commonly prescribed by physiotherapists as being effective. Objective: To evaluate the effect of McKenzie protocol for patients suffering from chronic mechanical cervical spine pain. Methodology: The study design comprises a quantitative research approach with pre and post-test control group design. It was conducted in a selected rehabilitation center, Bhubaneswar, Odisha. The study sample included 60 mechanical neck pain individuals, 30 in each experiment & control group. Random assignment with a purposive selection of the samples was taken for the groups. The structured interview schedule for background data, structured pain assessment proforma, the visual analog scale, and the neck disability index were used as tools for gathering necessary data for neck pain from the samples. The McKenzie protocol compared with the control group was noted for pain intensity as well as NDI were assessed for two weeks. The analysis and interpretation of obtained data were performed by following descriptive and inferential statistics in terms of frequency, percentage, mean, median, and "t" value. The "t" test was applied to compare the pain in pre- and post-interventions. A p-value of $\alpha < 0.05$ was taken as the level of significance. Results: It was found that; there was significantly lower in the mean post test scores than the mean pretest VAS, as well as NDI scores of the experiment group. The Mean posttest VAS scores of the experiment group (5.733) and the control group (4.867) with a mean difference of 0.8667 were found to differ significantly as evident from the 't' = 2.561 at df, 28 at $\alpha=0.05$ level. Apart from this the mean posttest (16.33) pain scores by NDI of the experiment group and control group (13.33) with a mean difference of 3.0, having 't' = 2.757 at df, 28 differed significantly at $\alpha= 0.05$ level. Conclusion: McKenzie protocol was found to reduce mechanical spine pain and alleviated the condition, and thus would be very helpful in the management of neck or cervical spine pain.*

Keywords: Mechanical cervical spine, McKenzie protocol

Introduction:

Cervical spine pain or Neck pain is a common musculoskeletal disorder that may be associated with altered coordination in cervical, neck, and shoulder muscles. This may be aggravated by various conditions.¹ Individuals suffering from neck pain may find difficulties with activities like turning head or while working on a computer.² Their ability to perform their routine work, social and sporting activities, and sporting may significantly decrease leading to an increase in burden.³ Increased evidence of exercises intended specifically to build endurance in the extensor muscles in the neck can help to address these deficits and decrease pain. Exercise therapy is reported to be effective for the treatment of neck pain. The therapeutic neck exercise protocol like protocols like range-of-motion exercises, isometric exercises, postural training by a therapist.⁴ Non-invasive techniques, medication manipulation, mobilization, electrotherapy, have shown no benefit in providing relief and functional improvement in radiating neck pain. Taking advantage of the patient's movements, the

McKenzie protocol abolishes pain and restore function. In this experiment effect of McKenzie protocol on the management of cervical pain has been discussed.⁵

Statement of the problem

Assess the effect of McKenzie protocol in individuals with mechanical cervical spine pain.

Objectives

1. To assess the level of pain in individuals of the chronic mechanical cervical spine.
2. To evaluate the effect of McKenzie protocol for individuals suffering from chronic mechanical cervical spine pain.

Methods and materials:

A quantitative research approach with pre and posttest control group design was selected for conducting the study. As described earlier the study was conducted in CIRS, Bhubaneswar, Odisha. The study sample included 60 mechanical neck pain subjects, 30 in each experiment & control group. The sample selection was done through a purposive technique and assigned randomly to the groups.

The inclusion criteria selected for the study were; both males and females with 20-50 years of individuals having neck pain for more than three months, VAS more than 3, NDI > 20%. Those are excluded were Children, having signs and symptoms of neurological disorders, previous or present of history of neck, shoulder, and head trauma with or without structural disorders, CVC, Rheumatoid arthritis, Vertebrobasilar insufficiency, Neoplasm of head and neck., etc.

A structured interview schedule was prepared for collecting demographic data. Further A structured proforma was prepared by the investigator to determine whether the sample is in mechanical neck pain through personal interview and physical assessment. It was composed of eight items on mechanical neck pain assessment such as type of pain, nature of pain, aggravating factor, relieving factor, behaviour, irritability, gait, and motion sickness. The tests were chosen to assess various pain-sensitive regions in the neck. Various tests used were: (a) single movement of active flexion or extension with neck retraction; (b) maximum of 2 minutes of flexion, rotation of the neck or extension including retraction; (c) the foramina intervertebral test; (d) the upper limb tension test. The subjects are asked to mark a point on the line. Similarly, the neck disability index, VAS, the self-structured assessment instrument to measure the rate of disability due to neck pain was taken. A total of 10 sections with scored from 0 – 5 in each having a maximum score of 50 was taken.

PROCEDURE:

McKenzie protocol: 10-15 reps, thrice per 15 minutes a day for two weeks.

Step-I (Retraction): The researcher was assisted to move the head backward as far as possible from a protruded position so that it is orientated more directly above the spinal column in Seated on an upright chair with rather high back And Sit against the back of the chair allowing the head to adopt a neutral relaxed position¹¹.

Step-II (Retraction and extension); Here also head and neck retraction and extension done followed immediately by the movement of the head and neck into the fully extended position is seated on an upright chair with a rather high back and sit against the back of the chair allowing the head to adopt a neutral relaxed position¹¹.

Retraction and extension (Lying supine):

The patient was instructed to retract the head by pulling the chin down as far as possible. (pillow under the head) and to remain supine, place one hand behind the occiput, and over the end the treatment table so that the head, neck, and shoulders unsupported down to the level of 3rd 4th thoracic vertebrae.

Retraction and extension (Lying prone)

The patient instructed to lie prone on the treatment table leaning on the elbows to raise the upper trunk followed by retracting and extending the head and neck in the same manner¹¹.

After fulfilling the inclusion and exclusion criteria, the study was conducted for two weeks. A sample of 60 Individuals having neck pain of selected hospitals who met the sample criteria was purposively selected for the study. The selected samples were conveniently assigned to the experimental group

and control group. The individuals selected in the treatment group were given code no. 'EXP' and the control group were given the code number as 'CON'. Data collection was done according to the research design. Individuals of the treatment group and control group were interviewed for sample characteristics data. Baseline data was collected using VAS and NDI.

McKenzie protocol was given to the experimental group. The protocol was given and followed for two weeks and the second reading for VAS and NDI was taken. Data were collected twice pre and post-intervention. Participants were given the instructions to follow the taught exercise regimen once daily with ten repetitions of each exercise and report the change in pain in the VAS index.

Result and discussion:

Most of the subjects (67%) of the experiment group whereas (53%) of the control group were 31-40 years of age. (60%) samples in the experiment group and (53%) in the control group were males and the rest were females. In religion many of the subjects (73%) of the test group and (80%) of the compare group were Hindus. As regards education, more numbers (47%) of the group-I samples were having graduate whereas in group-II (40%) of the samples were having postgraduates. Occupation of the samples indicated that a greater number of the samples (60%) of the experiment group were laborers whereas (40%) of the control group were services holders. As regards the type of family (67%) of the group-I and (80%) of the group-II were from the nuclear family. As regards to the monthly income of the family (73%) of the experiment group and (60%) of the control group were in the range of Rupees 10,001 and above per month.

The data depicted in figure- 1 to 4 shows that; As regards the type of pain 25% of the Experimental group were having stabbing & 22% sharp pain whereas of the control group 33% were having sharp pain. Further, it shows all the samples of both groups were having the presence of mechanical pain. The pain was aggravated by prolonged bending in (22%) of the Experiment group and (25%) of the control group. Similarly, the pain was relieved by (20%) of the Experimental group were by raising & (22%) as day progress whereas in of control group was relieved by 13% in lying position. In behaviours of pain (50%) were intermittent and (41%) were having continuous pain in both the groups. In the presence of irritability, 50% of samples from the Experimental group and (55%) from the control group were mild irritability. Most of the samples of both groups were having normal gait. As regards to motion sickness (63%) were present and (40%) were absent in both the groups.⁶⁻⁸

The data are shown in Table- 1, reveals that the mean of posttest VAS scores of the experiment group were 3.4 and in the control group was 4.9 with as Md of 1.5, was statistically significant as evident from 't' = 3.52 at df = 58 at $\alpha = 0.05$ level. The result found that the observed mean difference between the post-test VAS score of both the group was a true difference. That indicates, VAS score of the experimental group in the mechanical cervical spine was significantly reduced than the control group. Thus, it can be inferred that the McKenzie protocol was a very good effect on reducing the VAS scores of individuals in mechanical cervical spine pain.

The data shown in Table- 2, reveals that the mean of posttest NDI scores of the experiment group was 13.33 and in the control group was 16.33 with as Mean difference of 3.0, was found to be significant at 't' = 3.96 with df 58 at $\alpha = 0.05$ level. This found that the post-test Md between the NDI score of both the group was a true difference. This results that the NDI score of the experimental group in the mechanical cervical spine was significantly reduced than the control group. Thus, it can be inferred that the McKenzie protocol was a very good effect on reducing the Neck disability index scores of individuals in mechanical cervical spine pain.⁹

A study by Gorel et al published in J Rehabil Med 2002 also gave similar results where there were improvements seen in the groups given general exercise and McKenzie protocol Neck disability index (NDI) changes – Neck disability index shows significant improvement within the group and between the two groups. Thus, as both, the groups show significant improvement after superior in producing an effective change in NDI.^{10,11}

Ethical consideration

The interpersonal relationship was established, Purposes of the study were explained to the samples, consent taken and confidentiality was assured. Permission obtained from the Head of the Department. No problem was faced during the data collection period. There was full co-operation from the sample, staff, and administration.

Conclusion

Based on the findings, mechanical cervical spine pain having significantly differed in VAS scores and NID scores as observed in pre and post-therapy with the control group. Further, it also shows that McKenzie protocol was significantly reduced VAS scores, and NID scores perception scores individuals in mechanical cervical spine pain. Further study to be needed for musculoskeletal care emphasizing patient empowerment and self-treatment.

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Ethical statement: This study was approved by the institutional ethical committee and the prior consent of the patients was taken before the collection of samples.

Conflict of interest: The author declares that there was no conflict of interest.

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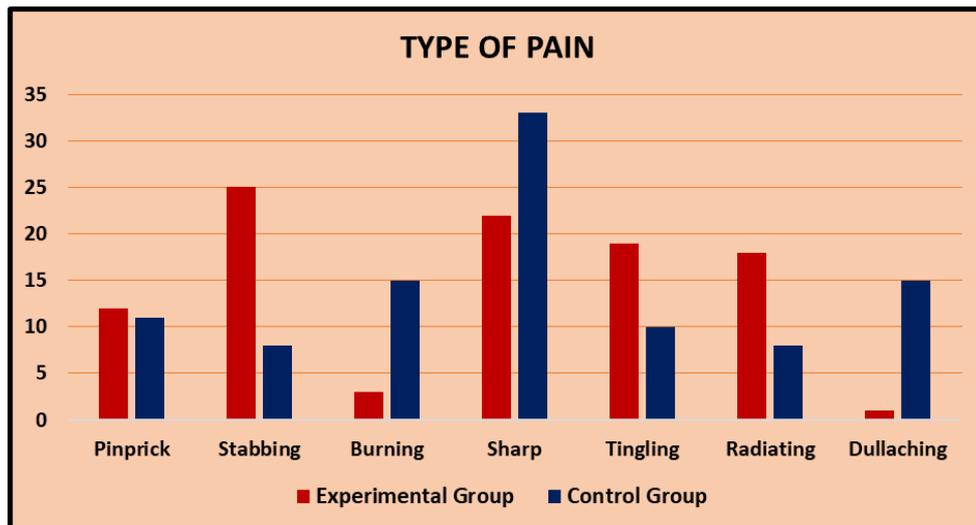


Figure -1: Type of pain

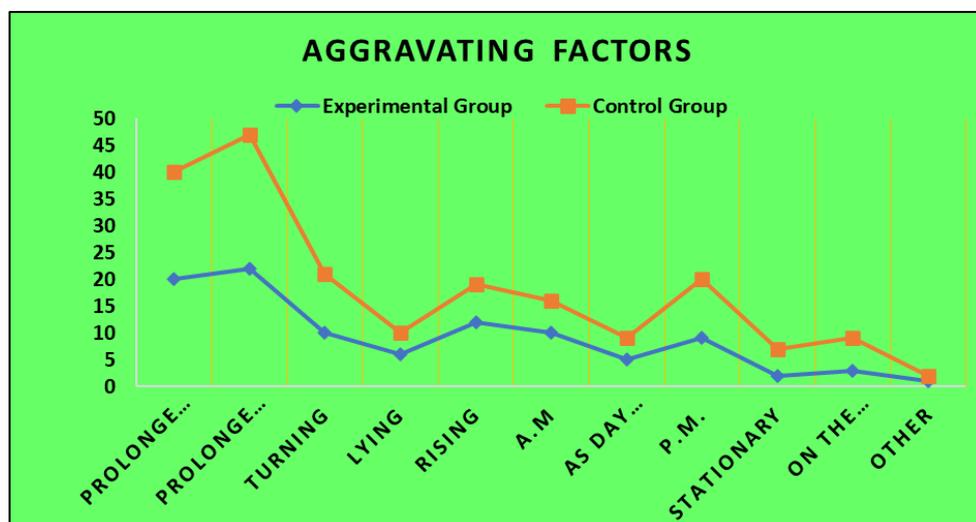


Figure -2: Aggravating factors

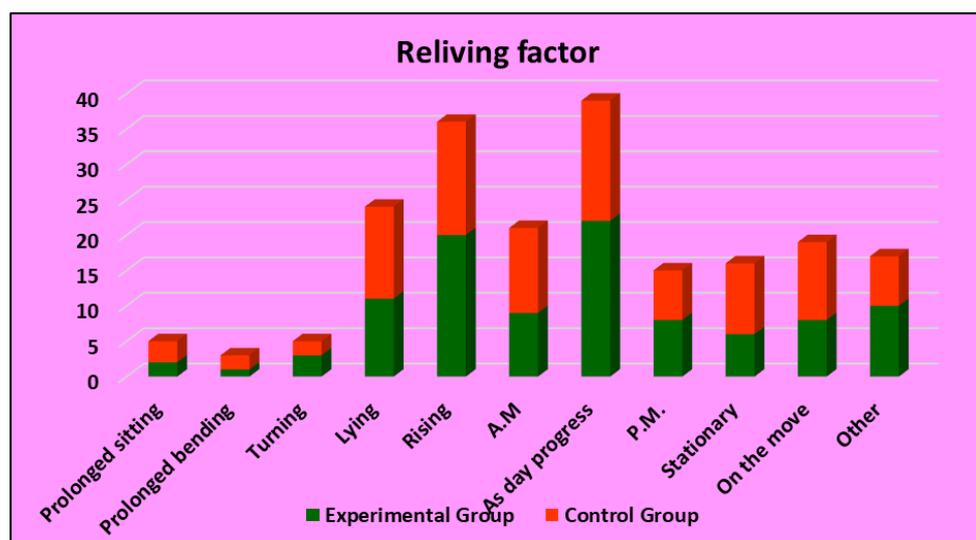


Figure -3: Reliving factors

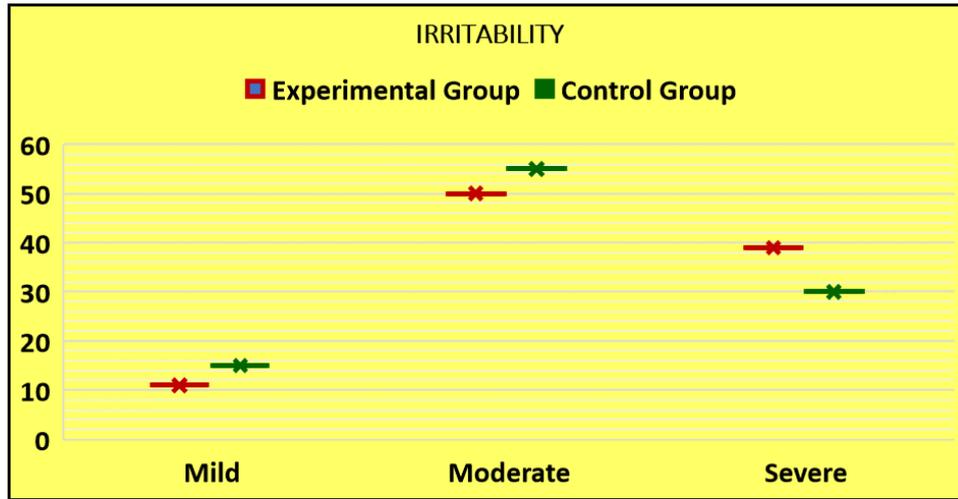


Figure -4: Presence of Irritability

TABLE – 1: Mean, SD of Mean difference and “t” values of Posttest VAS Scores In Experiment Group and control group

GROUPS	Mean	SD	Md	“t” value
Experiment Group (n=30)	3.4	1.2	1.5	t=3.52*, df=58
Control group (n=30)	4.9	0.5		

* Significant at $\alpha = 0.05$ level of significance

TABLE -2: Mean, SD of Mean Difference and “t” test of Posttest NDI scores In Experimental Group and control group

GROUPS	Mean	SD	Md	“t” test
Experiment Group (n=30)	13.33	8.22	3.0	‘t’ =3.96*, df=58
Control group (n=30)	16.33	8.91		

* Significant at $\alpha = 0.05$ level of significance