

COMPARISON OF MET AND MULLIGAN MOBILIZATION SNAGS IN REDUCING NECK PAIN AND IMPROVING FUNCTIONAL ACTIVITIES IN CHRONIC MECHANICAL NECK PAIN PATIENTS

Sadia Zafar Malik^{1,2}, Rizwan Haider², Ayesha Razzaq³, Adeel ur Rehman⁴, Sumre Zahra⁵

ABSTRACT

Neck pain is the most common musculoskeletal pathology that is occurring in the population of all ages and all regions of the world. The mechanical neck pain is mostly treated with Muscle Energy Techniques and Mulligan mobilization SNAG. The purpose of the study is to examine the effect of Mulligan Mobilization (SNAG) and PNF techniques for treating mechanical neck pain. This single-assessor patient-blinded randomized clinical trial research study, was conducted in the Mayo Hospital setting according to predefined inclusion and exclusion criteria for the treatment of chronic mechanical neck pain by using simple random sampling techniques. Patients were divided into two groups Group A and Group B through a lottery method. Group A Received Mulligan mobilizations and Group B received METS. Results of this study concluded that both groups showed statistically significant results but between-group analysis showed that Mulligan mobilizations produced statistically better results compared to METS with p value >0.05 Mulligan mobilizations are more effective in treating chronic mechanical neck pain in improving quality of life and functional status than METS.

Authors Affiliation

^{1,2}King Edward Medical University

³Physiotherapist, Mayo Hospital Lahore, Pakistan

⁴physiotherapist DHQ Gujranwala

⁵Physiotherapist, Shadra Teaching hospital

Corresponding Authors Email:
sadiamalik.0322@gmail.com

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INTRODUCTION

Neck pain is mostly described as the "pain which happens in the boundary of the superior nuchal line above, from the transverse line through the tip of first thoracic spinous process inferiorly and laterally tangential to the lateral border of the neck up to the superior border of the clavicle and suprasternal notch" (1). Mechanical neck pain is generalized neck pain due to the mechanical features like the symptoms due to abnormal neck movement, posture, or the palpation of the muscles of the neck This is the pain that is mostly located at the cervicothoracic region of the spine which causes the development of the neurological symptoms including radiating pain into upper extremity and cervicogenic headache (2).

Neck pain is categorized as Acute neck pain which lasts for 7 days, sub-acute neck pain lasts for more than seven days and chronic

neck pain is more than 3 months and produces a long-duration disability (3).

Neck pain is the most common musculoskeletal pathology which occurs occurring populations of all ages and all regions of the world. It mostly affects 10% of adults with a prevalence of 6 to 22 % and 38% of elders with a lifetime prevalence of 14.2 to 71%. Mostly 50 to 70% of people experience neck pain their whole life and approximately 60% of individuals experience chronic pain their whole life (4) (5).

Poor posture has been one of the most common causes of chronic mechanical neck pain. The most common abnormal posture is the forward head posture. It causes the shortening of postural muscles like levator scapulae, and upper trapezius, as weakness in deep neck flexors, and rhomboids (6).

It is the most common medical condition and has a severe effect on quality of life, a vast term in which different aspects of human life have been included. Although it has no association with mortality but has negative impacts on life reduced physical activity, affecting social and mental health, isolation from society, lethargy, depression, and the health of human beings. It is most common in women in their 50s. It causes a range of motion reduction; it may be due to mechanical restriction between vertebrae. It causes pain, fiber contracture, bone ankyloses, or spasms of muscles (7).

The physiotherapy approach in the management of chronic mechanical neck pain includes many interventions like modalities, therapeutic exercises, manual therapy, functional training, and massage exercises. The exercise interventions include METs, which are a form of active stretching technique and play an effective role in reducing pain and improving functional limitations. Another intervention is the MULLIGAN MOBILIZATION SNAGS, which deals with overcoming the faults developing in joint position. There are multiple treatment approaches for mechanical neck pain like medications but physiotherapy is most effective using multiple treatment domains (8).

MATERIAL AND METHODS

Design if the study was a blinding Randomized Clinical Trial (RCT). Data was collected from the Physiotherapy department of Mayo Hospital. A sample size of 60 patients (30 patients in each group) is estimated by using a 5% level of significance, 90% power of test with expected mean value pain intensity.

Group I = 3.04 ± 1.17 Group II = 2.39 ± 0.9
 $n = \sigma^2 (Z1 - \alpha + Z1 - \beta)^2 / (\mu1 - \mu2)^2$ $\sigma^2 =$ Variance

$Z1 - \alpha =$ confidence interval 95% = 1.96 $\mu1 =$ Population mean I = 3.04 $\mu2 =$ Population mean II = 2.39

$Z1 - \beta =$ Power of test 95%

Simple Random Sampling Technique (Probability technique). This research was conducted according to the inclusion and exclusion criteria for the treatment of Stress urinary incontinence in obese women. Inclusion criteria include Age, male and female, and Mechanical neck pain (stiffness, episodic pain). Exclusion criteria include Infectious disease, Cancer / Malignancy history, History of any cervical surgery, History of trauma at the cervical spine, and Pregnancy for the assessment and examination, both groups were given the same protocol. The data included demographic information i.e. gender, age, marital status, socioeconomic status, nature, onset, and duration of problem. Written informed consent was taken from every individual participating in this study before performing any physical examination. In the consent form, it was mentioned that he/she was involved with the Physiotherapist for a specific period of treatment up to follow-up. And he/she can stop the treatment anytime during the plan. Allocation in the groups was random. Numeric Pain Rating Scale (NPRS), Neck Disability Index (NDI), Goniometry.

In this study; patients will be divided into II groups Group A and Group B through the lottery method. NPRS, NDI, and goniometry will be used to assess the chronic mechanical neck pain. Neck movements and ranges will be assessed through a goniometer in the sitting or supine position. NPRS is used for assessing the intensity of the pain in the participants as it is the most valid and reliable tool for pain assessment Patients will asked to rate their pain severity from 0 to 10 from no pain to worst pain (20). NDI will be used for assessing the severity of the disability as the participants will have to choose the correct or nearest answer according to their condition scoring will be done from 0 to 5 and the total score will be

from 0 as no disability to 50 with total disability (21).

Two groups for a research study are as follows:-

Group A:-

This group will receive:

1. Conventional treatment
2. Mulligan SNAG s mobilization

Group B:-

Group B will receive:

- I. Conventional treatment
- II. Muscle energy techniques.

RESULTS

The result of the data showed that Mulligan SNAG Mobilization was more effective than Muscle Energy Techniques in improving pain in Mechanical Neck Pain **Table 1**. The results from **Table 2** showed that the Mulligan SNAGs Mobilization (.0001<.05) were more effective than Muscle Energy Techniques in improving pain in Mechanical Neck Pain (.865>.05). Similarly, the Mulligan SNAGs Mobilization 0.0001<.05 were more effective than Muscle Energy Techniques in improving Range of motion in Mechanical Neck Pain 0.462>.05 **Table 3**. The Independent t-test was used to compare the means of pre and post-treatments of Range of motion with group A and B. The findings showed that the p-value of pre-treatment is .0170>.05. Whereas the after-treatment showed significant results as .0001<.05 which indicates that the Mulligan SNAGs Mobilization were more effective than Muscle Energy Techniques in improving Range of motion in Mechanical Neck Pain.

DISCUSSION

Manzoor et al. concluded that Mobilization improved the pain, functional limitation, and range of motions of the neck especially extension more effectively as compared to the METs which shows Mobilization is more effective in producing improvement early

than METs (10). The current study supports the previous by concluding that Mobilization is more effective than MET in improving symptoms in Chronic Mechanical Neck Pain Patients. Tank. D conducted an RCT study on mechanical neck pain to determine the effectiveness of the mobilization and METs. The results showed that both treatment protocols showed positive results in improving pain, functional abilities, and ranges of the neck with $p > 0.05$, and on comparison, it also showed that both groups are equally effective in treating mechanical neck pain (11). The current study is not consistent with the previous by concluding that Mobilization is more effective than MET in improving symptoms in Chronic Mechanical Neck Pain Patients. Anwar. N conducted a quasi-experimental study on mechanical neck pain treated with (mobilization + METs) alone and with a combination of both protocols. The study concluded that the combination of both protocols yields better results but pain and disability are reduced by mobilization and ROM is improved by METs (12). The current study is not consistent with the previous by concluding that Mobilization is more effective than MET in improving the range of motion and pain in Chronic Mechanical Neck Pain Patients. Osman. M concluded that METs showed better results in improving scores of NPRS, NDI, and ROM especially rotation than static stretching with $p < 0.05$ value as METs reduced both active and passive tension in the muscle which improved ranges, reduced pain and NDI score while stretching only focus on the passive tension reduction of the muscle (13). The current study supports the evidence by concluding that MET improves ranges and reduces pain and NDI scores in symptomatic patients. A systematic review conducted by Nugraha concluded that METs is an effective treatment protocol for mechanical neck pain as it improves the pain, functional limitations,

and ranges of the cervical region and thickness of the muscles by relaxing mechanism and reduction in the tone which made it an effective treatment protocol (14). current study supports the evidence by concluding that MET improves ranges, and reduces pain and NDI scores in symptomatic patients. Akshay Pal concluded that SNAGs showed statistically significant results in improving the disability index in patients, ROM, and pain in chronic mechanical neck pain along with the conventional protocol (9). The current study supports the evidence by concluding that SNAGs improve ranges and reduce pain and NDI scores in symptomatic patients. A systematic review conducted by Pitanc concluded that the Mulligan technique SNAG and NAG are safe and effective in improving the pain, functional limitations, and ranges of the cervical region in such disorders (15). Current studies support the evidence by concluding that SNAGs improve the pain, functional limitations, and ranges of the cervical region.

A study conducted by the Zemadani concluded that Mulligan mobilization showed significant improvement in the NPRS and NDI scoring with $p < 0.001$ as this technique played an important role in improving the pain and disability level in

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chronic mechanical neck pain (16). Current studies support the evidence by concluding that SNAGs improve the pain, functional limitations, and ranges of the cervical region.

CONCLUSION

It was concluded that both techniques are effective in terms of Reducing Neck Pain and Improving Functional Activities and range of motion in Chronic Mechanical Neck Pain Patients. However, Mulligan SNAG Mobilization was more effective than Muscle Energy Techniques in improving outcomes in Mechanical Neck Pain.

Limitations:

Single blinded study

1. a population from a limited area participated.
2. 5 patients were dropped out as they were not able to continue the session. So data was analyzed by a total of 55 patients instead of 60 patients.

Recommendations:

As it is a single-blinded study, the researcher should conduct this with other blinding methods. Further research should be conducted using a larger population size. Further research should be done to measure the long-lasting effects of treatment by taking follow-ups for a longer duration

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Table 1: Comparing Pre-Post Numeric Pain Rating Scale (NPRS) with Group A (Mulligan SNAGs Mobilization) & Group B (Muscle Energy Techniques)

Treatment	Groups	Mean $\pm$ S.D	Mean Difference	t-statistic	p-value
Pre-Treatment	A	8.37 $\pm$ 1.129	0.53 $\pm$ 0.035	-1.858	.068
	B	8.90 $\pm$ 1.094			
Post-Treatment	A	2.30 $\pm$.952	4.6 $\pm$ 0.023	-9.512	<0.001
	B	6.90 $\pm$ 1.155			

Table 2: Comparing Pre-Post Neck Disability Index (NDI) with Group A Mulligan SNAGs Mobilization) & Group B (Muscle Energy Techniques)

Sr. No	Treatment	Groups	Mean $\pm$ S.D	Mean Difference	t-statistic	p-value
1	Pre-Treatment	A	28.90 $\pm$ 2.987	0.13 $\pm$ 0.081	-.171	.865
		B	29.03 $\pm$ 3.068			
2	Post-Treatment	A	8.20 $\pm$ 3.377	10.93 $\pm$ 0.748	-11.233	<0.001
		B	19.13 $\pm$ 4.125			

The results from Table 2 showed that the Mulligan SNAG Mobilization (**.0001<.05**) was more effective than Muscle Energy Techniques in improving pain in Mechanical Neck Pain (**.865>.05**).

Table 3: Comparing Pre-Post Cervical Flexion with Group A Group A Mulligan SNAGs Mobilization) & Group B (Muscle Energy Techniques):

Treatment	Groups	Mean $\pm$ S.D	Mean Difference	t-statistic	p-value
Pre-Treatment	A	34.47 $\pm$ 2.897	0.56 $\pm$ 0.137	-.740	.462
	B	35.03 $\pm$ 3.034			
Post-Treatment	A	66.93 $\pm$ 8.158	15.86 $\pm$ 3.343	3.833	<0.001
	B	57.07 $\pm$ 11.501			