

## Research Article

# Effect of First Rib Mobilization in Mechanical Neck Pain with Radiculopathy for Pain Relief

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### Abstract |

**Objective:** To check the effectiveness of First Rib Mobilization (FRM) in mechanical neck pain with radiculopathy for pain relief.

**Methods:** Fifty patients with age between 21- 60 years, who fulfilled the study sample selection criteria were registered in the study. After sample selection of 50 subjects (by scientific calculator) by using convenient sampling technique, a written consent was signed from each participant before any assessment and management. All subjects were treated by applying Maitland grade I, II first rib mobilization for a session comprising on 20 minutes. The subjects were treated thrice in a week for next 2 weeks. The participants were assessed before and after treatment. Numeric Pain Rating Scale (NPRS) was used to record pain severity level. A self-structured validated questionnaire was used to collect the demographics. Pain was assessed before and after first rib mobilization by using paired sample t-test was done to see the changes in the mean pain score.

**Results:** There was a note worthy change in NPRS means before and after treatment in context of statistics which was ( $t=19.29$  and  $p=0.000$ ). All subjects showed significant level of improvement in pain and discomfort with FRM because the calculated  $p$  value was ( $p=0.000$ ), which was less than the reference  $p$  value 0.05.

**Conclusion:** The study concluded that FRM was an effective treatment for subjects with mechanical neck ache and radicular symptoms

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**Keywords** | Maitland grade I & II first rib mobilization, Radicular mechanical neck pain

### Introduction

Neck disorder is a very common problem in general population and in our daily clinical practice.<sup>(1)</sup> Pain started in the neck and extend to the shoulder or base of the skull with restriction of neck movements. Occasionally patient felt numbness and tingling sensations in his arms and this is due to the nerve impingement.<sup>(2)</sup>

In Maxim Negative Pressure (MNP), spinal symmetry is altered and it happens, if any joint in the vertebral column shows changed joint assessorry movements. When joint play is getting disturbed, Range of Motion (ROM) becomes restricted and it creates pain which might be radicular in nature due to spasm or tightness of scalenius muscles. Prevalence of neck pain is higher in females.<sup>(3)</sup>

When the causes of neck ache were being discussed, the most obvious causes were abnormal anatomy and bad biomechanics<sup>(4)</sup> with multiple predisposing factors such as tension in the neck musculature, faulty posture, nervousness, sadness, frustration and leisure activities<sup>(5)</sup>. The major symptoms are neck discomfort with dizziness and radiating pain in the arms causing stiffness in cervical region.<sup>(6)</sup>

Patients of MNP usually develop first rib stiffness which is characterized by discomfort and difficulty in moving the neck, particularly when patient trying to turn the head forward, backward or in sideways. Stiffness may also be accompanied by neck and shoulder pain, tightness and sometimes headache. According to Innes 1994, first rib has a significant joint play but when first rib is found to be dysfunctional several muscles have been impaired, which are mainly scalene anterior and middle.<sup>(7)</sup>

Mechanical neck pain could be treated by giving pain killers, muscle relaxants, cervical collars, analgesic gels with physical therapy treatment (shortwave diathermy, isometric exercises, traction, ultrasound therapy, Transcutaneous electrical nerve stimulation, postural corrections and manual therapy and its prognosis depends upon severity of problem.<sup>(8)</sup>

The research gap which I found for the selection of this study is that first rib mobility is compromised due the tightness of scalenius muscles. There was not a single study which can reflect this technique with isometric exercises (hold relax) of scalenius muscles. The rationale of the study is to sort out the effects of First Rib Mobilization (FRM) in mechanical neck pain with radicular symptoms so that, patient's quality of life would improve with decreasing treatment time in future.

## Patients and Methods

A quasi-experimental study was conducted with sample of 50 subjects (by scientific calculator)<sup>(9)</sup> from National Hospital DHA, Lahore by convenient sampling technique. The participants who matched the criterion and decided to take part were included in

the study. From each individual written informed consent was being taken prior to take any information, assessment and management. All subjects were treated by applying Maitland grade I, II first rib mobilization for a session comprising on 20 minutes. The subjects were treated thrice in a week for next 2 weeks. The participants were assessed before and after treatment. Numeric Pain Rating Scale (NPRS) was used to record pain severity level. A self-structured validated questionnaire was used to collect the demographics. Pain was assessed before and after first rib mobilization by using paired sample "t" test. The quantitative variables were assessed by calculating mean and Standard Deviation (SD). Statistical Package for Social Sciences (SPSS) 21.0 version was used for analysis.

## Results

The mean age and SD of total subjects were  $46.15 \pm 9.668$ . The calculated mean NPRS pre-treatment and post-treatment scores were 3.70 and 1.54 simultaneously showing marked reduction in pain. There was a noteworthy change in NPRS means before and after treatment in context of statistics which was ( $t=19.29$  and  $p=0.000$ ). All subjects showed significant level of improvement in pain and discomfort with FRM because the calculated p value was ( $p=0.000$ ), which was less than the reference p value 0.05, indicating that FRM was a good technique to manage the MNP and radicular symptoms.

**Table 1:** Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
<b>Pre treatment</b>	3.7000	50	.50508	.07143
<b>Post treatment</b>	1.5400	50	.81341	.11503

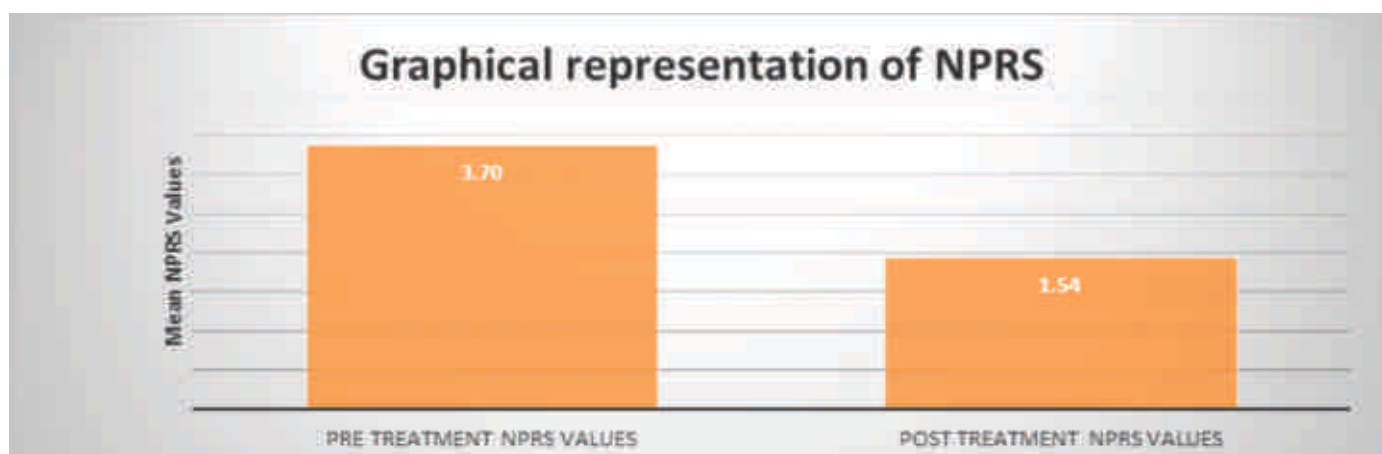
## Discussion

Radicular neck pains could be treated by Maitland grade I and grade II mobilization and having marked results in terms of pain reduction and enhancing the quality of life as proven in the previous studies.<sup>(8)</sup>

There are more females rather than males which

**Table 2:** Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
<b>Pre &amp; Post treatment</b>	2.16000	.79179	.11198	1.93497	2.38503	19.290	49	.000



**Figure:** Graphical Representation of NPRS

having radicular pain with neck ache. The stagnant or sedentary life style enhances neck disorders in comparison to active members of society. The current study showed that a marked change in NPRS means was seen pre and post successive treatment sessions of Maitland grade I & II first rib mobilization.<sup>(10)</sup>

First rib mobilization having better results to decrease stinging feelings, deadness and radicular pain in thoracic outlet syndrome as in current study have proved.<sup>(11)</sup>

This study would be helpful for clinical individuals to take precise choices of treatment and about its sessions for marked reduction in radicular MNP with grade I & II first rib mobilization and in economic cost.<sup>(12)</sup>

Future researches should take larger sample size with follow up sessions, it will give them more appropriate results. The future researches could be done by taking more treatment options in comparison to find out real effect of FRM.

## Conclusion

The study concluded that first rib mobilization was an effective treatment for subjects of mechanical neck pain and radicular symptoms.

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**Conflict of interest:** None

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