

Effectiveness of cervical mobilization and stretching exercise with or without upper thoracic mobilization on non-specific neck pain

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Objective: To compare effectiveness of cervical mobilization and stretching exercise with or without upper thoracic mobilization to decrease pain, increase range of motion and decrease disability in patients with non-specific neck pain.

Methodology: A convenient sample of 30 patients recruited from three major hospitals of Faisalabad was randomly divided into two treatment groups. Both groups had Hot Pack, cervical mobilization and stretching exercises while Group B additionally received upper thoracic mobilization. Duration of treatment was two weeks and three session per week. Pain intensity was measured at baseline and after each session. Neck Range of Motion (ROM) and Neck Disability Index (NDI) was measured at baseline and after 6th

session. Data were analyzed by SPSS version 20.

Results: There was significant reduction in pain and neck disability level ($p < 0.05$) in both groups. Neck ROM showed statistically significant difference in neck extension, neck left rotation and neck right rotation range. But, no significant statistical difference ($p > 0.05$) was observed in left lateral flexion, right lateral flexion and neck flexion ROM.

Conclusion: Both treatment groups showed significant reduction in neck pain and disability. But Group B showed better improvement of neck extension, neck left rotation and neck right rotation than group A. (Rawal Med J 202;45:80-83).

Keywords: Non-Specific Neck Pain (NSNP), cervical mobilization, upper thoracic mobilization, stretching exercise.

INTRODUCTION

Non-specific neck pain (NSNP) can be defined as neck pain in postero-lateral region of upper cervical to upper thoracic spine with or without any major structural pathology resulting in minor to major interference with activities of daily life as well as absence of neurological sign and symptoms and any other specific pathologies like; tumor, fracture and cervical spondylolysis, etc.¹ Neck pain is the second most leading disorder than low back pain.^{2,3} Two third of population suffers from neck pain once in a lifetime.⁴ Prevalence of neck pain is higher in women, urban areas and high earning countries as compared to males, low earning countries and rural areas.⁵

Chronic and untreated neck pain leads to poor body mechanics, bad posture and abnormal muscle tightness.⁴ Physiological motion of neck involves movement at upper thoracic spine.⁶ In acute or chronic neck pain, combination of mobilization, manipulation and exercise therapy is effective for pain relief.⁷ Multimodal approaches are found to be effective for chronic neck ache.⁸ Maitland mobilization in combination with therapeutic

exercises results in significant reduction in neck pain.⁵ The aim of this study was to compare effectiveness of cervical mobilization and stretching exercise with or without upper thoracic mobilization to decrease pain, increase range of motion and decrease disability in patients with NSNP.

METHODOLOGY

This single blinded Randomized Clinical Trial (RCT) was conducted from January to August 2018 at Madinah Teaching Hospital, Allied Hospital and Chiniot General Hospital, Faisalabad, Pakistan. It included 30 patients and after getting written consent they were randomly allocated to two Groups using lottery method (Figure). Primary demographic data were taken. Screening was done by using an assessment form based on following criteria; both genders (25-45years) with acute neck pain (3-7 on Numeric Pain Rating Scale) symptoms, 10-15% restricted ROM and had not undergone application of any medication and physiotherapy treatment were included in study. Patients having cervical disc prolapse, fracture/surgery of

cervical/thoracic spine, radiculopathy, diagnosed osteoporosis, inflammatory arthritis and vascular disease were excluded.

Both groups received Hot pack, Cervical (C₃-C₇) Maitland Mobilization (Grade I, II and III; PA glide) and Stretching Exercises while Group B additionally received Upper Thoracic (T₁-T₆) Maitland mobilization (Grade I, II and III; PA glide). Primary outcome measures were pain intensity recorded at baseline and end of each session by using Numeric Pain Rating Scale (NPRS) and neck Range of Motion (ROM) measured at baseline and after 6th session through Universal Goniometer. Secondary outcome was neck disability assessed by Neck Disability Index (NDI) at baseline and after 6th session. Total intervention time was two weeks and three session per week.

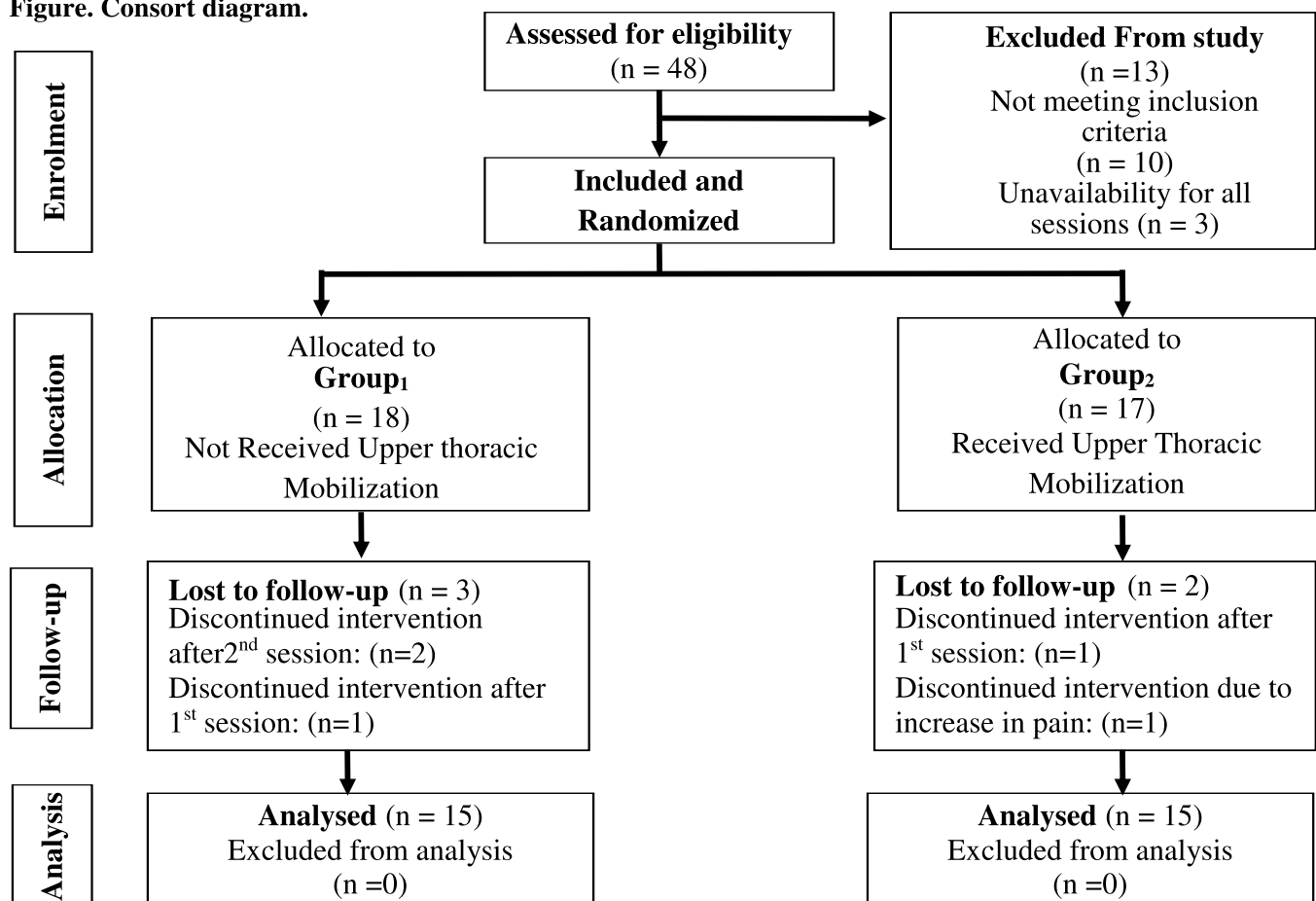
Moist heat through Hot Pack was applied on neck and upper thoracic region covering lateral sides also while patient was in either supine or prone lying

position for 15-20 minutes. Maitland cervical (C₃-C₇), Upper thoracic (T₁-T₆) mobilization was applied in prone lying position from via spinous process. Amount of treatment was 3-4 mobilizations for a vertebrae for 30 seconds approximately.⁹ After the 30-second, the therapist proceeded to next vertebrae and performed the same technique. This process was continued sequentially in a caudal direction to T₆, for an overall intervention time of approximately 5 minutes.

Passive stretching was applied to Upper trapezius, Levator scapulae, Sternocleidomastoid, Scalene, Pectoralis major and minor muscle for 3-5 repetition with 20-30 seconds hold.¹⁰ Intensity of exercise was prescribed according to patient's tolerance level. Duration of stretch was 15 to 30 seconds, 3-5 repetition and for 10 minutes.¹¹

Statistical analysis: It was performed through SPSS version 20. The level of significance for all tests was set at 0.05.

Figure. Consort diagram.



RESULTS

Forty-eight subjects were screened and 13 were excluded for not filling required criteria, 35 were recruited and 5 were dropped out from study. Total 30 patients were analyzed (15 per group), 16.67% were male and 83.33% were females. Independent Sample t-test result showed that there is no statistically difference in neck pain on NPRS between both groups ($p > 0.05$) (Table 1).

Table 1. Comparison of Pain on NPRS in two Groups: Independent sample t-test.

NSNP on Numeric Pain Rating Scale (NPRS)	Group of Treatment	Mean (Std. Deviation)	Between groups P-Value
NPRS At Baseline	Group A	7.67 (1.291)	0.871
	Group B	7.60 (0.910)	
NPRS After 1 st Session	Group A	6.67 (1.345)	0.086
	Group B	5.80 (1.320)	
NPRS After 2 nd Session	Group A	5.60 (1.352)	0.465
	Group B	5.27 (1.100)	
NPRS After 3 rd Session	Group A	4.73 (1.100)	0.517
	Group B	4.47 (1.125)	
NPRS After 4 th Session	Group A	4.20 (1.207)	0.724
	Group B	4.07 (0.799)	
NPRS After 5 th Session	Group A	3.53 (0.743)	0.225
	Group B	4.00 (1.254)	
NPRS After 6 th Session	Group A	2.73 (0.458)	0.207
	Group B	3.00 (0.655)	

Table 2. Comparison of Range of Motion at Baseline and after 6th session between Groups: Independent sample t-test.

Neck Range of Motion (ROM)	Group of Treatment	Mean (Std. Deviation)	Between groups P-Value
Neck Flexion ROM at baseline	Group A	27.87 (5.09)	0.702
	Group B	27.00 (7.04)	
Neck Flexion ROM after 6 th session	Group A	39.27 (2.21)	0.310
	Group B	66.53 (102.06)	
Neck Extension ROM at baseline	Group A	20.40 (8.95)	0.001
	Group B	33.33 (9.59)	
Neck Extension ROM after 6 th session	Group A	37.87 (7.59)	0.003
	Group B	45.73 (5.58)	
Neck Right Lateral Flexion ROM at baseline	Group A	21.00 (7.85)	0.286
	Group B	24.07 (7.58)	
Neck Right Lateral Flexion ROM after 6 th session	Group A	34.73 (5.45)	0.521
	Group B	36.00 (5.21)	
Neck Left Lateral Flexion ROM at baseline	Group A	23.00 (6.48)	0.781
	Group B	23.60 (5.13)	
Neck Left Lateral Flexion ROM after 6 th session	Group A	35.00 (5.55)	0.610
	Group B	35.93 (4.26)	
Neck Right Rotation ROM at baseline	Group A	34.93 (11.79)	0.458
	Group B	38.53 (14.29)	
Neck Right Rotation ROM after 6 th session	Group A	50.40 (9.52)	0.032
	Group B	58.20 (9.36)	
Neck Left Rotation ROM at baseline	Group A	34.13 (13.35)	0.187
	Group B	40.53 (12.57)	
Neck Left Rotation ROM after 6 th session	Group A	53.53 (10.21)	0.033
	Group B	61.20 (8.43)	

Independent Sample t-test result showed ROM was statistically significantly different in neck extension, neck left rotation and neck right rotation after 6th session. No statistically significant difference were observed in left lateral flexion, right lateral flexion, and neck flexion ROM between two groups after 6th session (Table 2).

Table 3. Comparison of Neck Disability between Groups: Independent sample t-test.

Neck Disability Index (NDI)	Group of Treatment	Mean (Std. Deviation)	Between groups P-Value
Neck Disability Index at Baseline	Group A	56.40 (17.29)	0.254
	Group B	50.06 (12.03)	
Neck Disability Index after 6 th Session	Group A	20.73 (7.10)	0.729
	Group B	21.53 (5.28)	

Independent Sample T-Test result showed p-value of all Neck Disability Index (NDI) between both groups which was more than selected alpha 0.05, so both groups are equally effective for reducing neck disability in patients having NSNP (Table 3).

DISCUSSION

Neck pain was found more in females as compared to males, as reported by a recent study.¹² Age between 35-49 years was found to be more prevalent for developing neck pain.⁵ Current study found that upper thoracic mobilization doesn't yields any additional effect for reducing NSNP and disability. Similar findings have been reported by previous authors that vertebral mobilization is not specific to the level (symptomatic and asymptomatic) being mobilized.¹³

Manual therapy and stretching exercises both were effective for reducing NSNP. However, manual therapy was found to be more effective.¹⁴ Previous studies shows Maitland mobilization had significant effect on reducing neck disability and NSNP.¹⁵ Therapeutic exercises along with vertebral Maitland mobilization were effective for reducing NSNP and disability.⁶

Current study found that for neck extension, neck Left Rotation and neck Right Rotation ROM Group B showed greater improvements but no statistically significant difference were observed in Left Lateral

Flexion, Right Lateral Flexion and Neck Flexion ROM between both groups. Similarly, a previous study also reported the results that Maitland mobilization results in significant improvement in all neck ROMs.¹⁶ Maitland mobilization along with therapeutic exercises was more effective for improvement on right lateral flexion. However, for rightward rotation the findings were same.⁶

CONCLUSION

The results of study showed that cervical mobilization and stretching exercises with or without upper thoracic mobilization were equally effective for improving neck ranges, reducing NP and disability. However, addition of Upper Thoracic Maitland mobilization showed more improvement of neck extension, neck left rotation and neck right rotation.

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