ORIGINAL ARTICLE

Comparison of effectiveness of muscle energy technique with Mulligan mobilization in patients with non-specific neck pain

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Abstract

Objective: To compare the efficacy of muscle energy technique with Mulligan mobilisation in patients having non-specific neck pain.

Method: The quasi-experimental study was conducted at the Physiotherapy Department of Mayo Hospital, Lahore, Pakistan, from March to September 2017, and comprised patients of either gender having non-specific neck pain who ere divided into two groups. In group 1 patients, muscle energy technique was used, while group 2 patients had Mulligan mobilisation. Pain intensity, functional status of neck and cervical range of motion were measured before and after treatment. Data was analysed using SPSS 21.

Results: Of the 56 patients, 28(50%) were in each of the two groups. The overall mean age was 36.89±9.28 years. Pain intensity, functional status and neck extension range of motion improved significantly more in group 2 ($p<0.05$).

Conclusions: Mulligan mobilisation was found to be a better option in managing patients with non-specific neck pain.

Keywords: Cervicalgia, Manual therapies, Muscle energy technique, Physical therapy techniques. (JPMA 71: 1532; 2021)

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Introduction

Neck pain (NP) is defined as the pain "any place in the neck confined by nuchal line superiorly, imagined line through the tip of first thoracic spinous process inferiorly, and sagittal plane oblique to lateral border of neck laterally".[1] After low back pain (LBP), NP is the second most common in the general population.[2] NP prevalence is ranges 43-66.7%, which increases along with age.[3] The onset of pain may be insidious or may follow trauma, and it may be recurrent or persistent in nature.[2] Common NP causes include degenerative disc disease, herniated disc disease, cervical radiculopathies, myofascial pain syndrome[4] and viral infections.[5] Muscular strains, postural and ergonomics are also related to NP and whiplash injuries. Ideally, the pain goes away in 1-3 weeks, but in some cases it persists and become chronic neck pain (CNP.[6] Non-specific NP reduces range of motion (ROM) which may be linked to mechanical restriction between two or more vertebrae and muscular spasm.[7] The commonest complaint of non-specific NP is the limitation of mobility.[8]

A mechanical NP can be cured by a variety of physiotherapy protocols, but no single effective treatment exists.[9] Mulligan mobilisation techniques (MMTs) include several methods, such as sustained natural apophyseal glides (SNAGs) and natural apophyseal glides (NAGs) that target the spine.[10] MET and stretching techniques are common physiotherapy treatment. Muscle energy technique[11] is a form of muscle stretching exercise.[12] A study described the efficacy of MMT in NP treatment, concluding that Mulligan SNAG was more effective than NAG.[13]

Though studies have compared the efficacy of MET, stretching and other mobilisation techniques, but no single study has compared the outcome of MET and MMT in non-specific NP cases.

The current study was planned to compare the outcome of MET and MMT on pain intensity and functional status of neck in non-specific NP.

Patients and Methods

The quasi-experimental study was conducted at the Physiotherapy Department of Mayo Hospital, Lahore, Pakistan, from March to September 2017. After approval from the institutional ethics review committee, the sample size was calculated using G Power software.[14] The sample was raised using random sampling technique from among male and female patients aged 20-40 years with cervical spondylosis, mechanical NP. Patients outside the age range, and with history of cervical surgery or serious spinal pathology, like tumour, infection and dislocation, systemic disease, fracture, vertigo and spinal stenosis, were excluded.

After taking informed consent from the subjects, they were randomised into two groups using the even and odd randomisation method. Group 1 received MET treatment and group 2 had MMT. Patients were assessed for pain,

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functional deficits and neck ROM using visual analogue scale (VAS), neck disability index[15] and goniometer respectively.[16] Demographic and clinical data was noted in a pre-designed performa. Treatment was given by an experienced physiotherapist. Physical tests used for assessment were foraminal compression test, or Spurling's test (specificity=92%, sensitivity=77%), and distraction test (specificity=100%, sensitivity=43%)[17-22] to rule out cervical nerve impingement. Vertebral artery test (interrater reliability=0.90)[23] was used for vascular symptoms, and craniocervical flexion test (sensitivity, specificity unknown)[24-26] for local cervical mobility.

In group 1, MET post-isometric relaxation was applied on sternocleidomastoid and upper trapezius muscles by holding movement for 5-10 seconds and maintaining the stretch for 30 seconds.[16] Each manoeuvre was repeated 3-5 times per treatment session two days in a week for three consecutive weeks. Group 2 received MMT SNAGs and NAGs. The techniques were performed to the end-point of the joint movement without causing any pain and administered to the painful areas identified by the patients. Mobilisation was practised with oscillatory moves with <6 repeats.[13] The technique was repeated six times having two sessions per week for three weeks.

Data was analysed using SPSS 21. Data was found to be normally distributed. Quantitative variables were expressed as means ± standard deviation (SD). Qualitative variables were expressed as frequencies and percentages. Independent t-test was used to see the variation in the treatment outcome before and after treatment sessions. P≤0.05 was taken as significant.

Results

Of the 56 patients, 28(50%) were in each of the two groups. The overall mean age was 36.89±9.28 years. Intra-group and inter-group pre-treatment and post-treatment values were noted (Table). Pain intensity, functional status and neck extension ROM improved significantly more in group 2 (p<0.05).

Table: Pain intensity, functional status and ranges of neck according to VAS, NDI and Goniometre.

Study variables	Group 1 (n=28) (11)		Group 2 (n=28) (Mulligan)		p-value
	Before treatment Mean±SD	After treatment Mean±SD	Before treatment Mean±SD	After treatment Mean±SD	
Pain Intensity (VAS)	6.64±1.13	3.04±1.17	7.25±1.14	2.39±0.99	0.03
Functional Status (15)					
12.03±4.69	24.57±7.81	14.89±5.86	37.96±8.73	0.00	
Neck Flexion ROM	25.18±7.13	39.00±5.70	25.50±4.91	53.36±6.58	0.19
Neck Extension ROM	27.86±8.65	41.29±5.24	29.29±10.10	47.04±6.65	0.001
Neck Side bending ROM	23.93±8.21	36.61±8.03	24.89±9.09	39.00±6.93	0.24
Neck Rotation ROM	32.14±12.58	46.96±12.72	33.50±13.85	53.46±16.80	0.11

VAS: Visual analogue scale; NDI: Neck disability scale;SD: Standard deviation; ROM: Range of motion.

Discussion

The MMT group showed significant results in terms of pain intensity and functional status of the neck, but in case of ROM, both groups showed significant improvement. The MMT group showed better results just after first week in terms of rotation ROM, and two weeks in terms of extension, but for side-bending and flexion, maximum range improved after the third week compared to the MET group.

The improvement in ROM for MET group was similar to earlier studies.[27] A study found immediate increase in neck ROM in all three planes in mechanical neck pain patients treated with MET who showed improvement in all six directions of motion. When Maitland and Mulligan mobilisations were studied together, they had an effect on improving NP and ROM.[28] A study showed that NAGs was an operational mobilisation technique for providing quicker and long-lasting outcome in reduction of pain and providing better ranges of neck.[11] Some studies favour MET efficacy by using and without using isometric exercises programme in non-specific NP, with comparisons between the patients alleviated with SNAGs only and those alleviated with SNAGs and isometrics showing significant difference in pain intensity and improvement in abilities of functional activities.[11,27,29]

More recent studies have shown more methods, including hypoalgesic and sympathetic nervous system excitation[30] but the current study not only showed better treatment, but also revealed a reduction in the number of sessions required for improvement of neck movements for both groups. Mulligan mobilisation is better than MET in terms of mean ROM for extension and flexion. The result is supported by an earlier study.[31] Hypoalgesic effects of MET can produce the mechanism which can lessen pain severity.[32] Some studies suggest significant improvement in MET group for pain intensity at two and four week follow-up.[33]

The limitations of the current study include a small sample with a short duration at a single centre.

Conclusion

MMT had significant effect in terms of pain intensity and functional neck status. For ROM, only extension was significantly improved by MMT.

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Conflict of Interest: None.

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