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RESEARCH ARTICLE

Comparative Efficacy of Muscle Energy Technique Versus Static Stretching with Conventional Physiotherapy Protocols in Young Adults with Mechanical Neck Pain: A Pilot Study

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Abstract: Introduction: Mechanical neck pain (MNP) is a common musculoskeletal disorder among young adults due to poor posture, ergonomics, and sedentary lifestyle. Manual techniques such as Muscle Energy Technique (MET) and Static Stretching (SS) are widely applied along with conventional physiotherapy. To compare the efficacy of MET versus SS, both with conventional physiotherapy, in reducing pain and functional outcomes such as Neck Disability. A pilot study with 50 participants aged 20–30 years diagnosed with MNP. Participants were randomly assigned to two groups: Group A (MET + conventional physiotherapy) and Group B (SS + conventional physiotherapy). Treatment was given three times per week for two weeks. Outcome measures included Visual Analogue Scale (VAS) and Neck Disability Index (NDI. Data were analyzed using paired and independent t-tests. Both groups showed significant improvement ($p<0.001$). Group A showed greater reduction in pain and neck disability improvement compared to Group B. MET with conventional physiotherapy was more effective than SS with conventional physiotherapy in young adults with mechanical neck pain.

Keywords: Muscle energy technique; Static stretching; Mechanical neck pain; Physiotherapy; Pilot study.

INTRODUCTION

Mechanical neck pain (MNP) is a prevalent musculoskeletal disorder with global lifetime prevalence ranging from 22–70% [1,2]. It is especially common among young adults due to prolonged screen exposure, sedentary lifestyles, and poor ergonomic practices [3,4]. The pathophysiology of MNP involves muscular imbalance, altered posture, and mechanical stress on cervical structures leading to pain and disability [5].

Conventional physiotherapy for MNP includes heat therapy, isometric exercises, and postural correction [6]. However, manual therapy interventions such as Muscle Energy Technique (MET) and Static Stretching (SS) are increasingly utilized to improve outcomes [7,8].

MET is a form of manual therapy involving voluntary isometric contraction of a muscle against resistance, producing post-isometric relaxation and improved mobility [9]. SS, on the other hand, involves sustained elongation of a muscle to enhance flexibility [10]. Studies suggest MET may provide superior outcomes in pain reduction, functional improvement, and ROM enhancement compared to SS [11–13].

This pilot study was conducted to compare MET versus SS, both with conventional physiotherapy, in young adults with MNP.

MATERIALS AND METHODS

This prospective comparative pilot study was conducted at the Physiotherapy Outpatient Department (OPD) of Mahatma Gandhi Hospital, Jaipur, India. The study was approved by the Institutional Ethics Committee of Mahatma Gandhi Medical College & Hospital (IEC No.: MGM C&H/IEC/JPR/2023/1794). Additionally, the trial was prospectively registered with the Clinical Trials Registry of India (CTRI/2024/11/076471).

A total of 50 young adults aged between 20–30 years, diagnosed with mechanical neck pain (MNP) of 4–12 weeks duration, were recruited for the study after obtaining written informed consent. Participants were randomly allocated into two groups:

Group A received Muscle Energy Technique (MET) combined with conventional physiotherapy (moist heat and isometric strengthening), while Group B received Static Stretching (SS) combined with conventional physiotherapy. Outcome measures included the Visual Analogue Scale (VAS) for pain and the Neck Disability Index (NDI) for functional disability.

Assessments were carried out at baseline, 2 weeks, and 4 weeks. Statistical analysis was performed using paired t-tests for within-group comparisons and independent t-tests for between-group comparisons, with significance

set at $p \leq 0.05$. The outcome assessors were blinded to group allocation to minimize bias.

RESULTS

All 50 participants completed the study with no dropouts. Both groups showed significant improvements in pain and disability from baseline to two and four weeks. In Group A (MET + conventional physiotherapy), the mean VAS score decreased from 6.36 ± 0.48 at baseline to 2.0 ± 0.6 at two weeks and further to 1.5 ± 0.5 at four weeks. In contrast, Group B (SS + conventional physiotherapy) showed comparatively smaller improvements, with VAS scores reducing from 6.48 ± 0.65 at baseline to 4.5 ± 0.7 at two weeks and 3.8 ± 0.6 at four weeks. Functional disability, assessed using the Neck Disability Index (NDI), also showed greater improvement in Group A, reducing from 23.28 ± 2.3 at baseline to 12.0 ± 1.8 at two weeks and 9.0 ± 1.5 at four weeks. Group B demonstrated a reduction from 23.72 ± 2.5 at baseline to 18.0 ± 2.0 at two weeks and 15.0 ± 2.1 at four weeks. These findings indicate that MET combined with conventional physiotherapy was more effective in reducing pain and disability compared to static stretching combined with conventional physiotherapy.

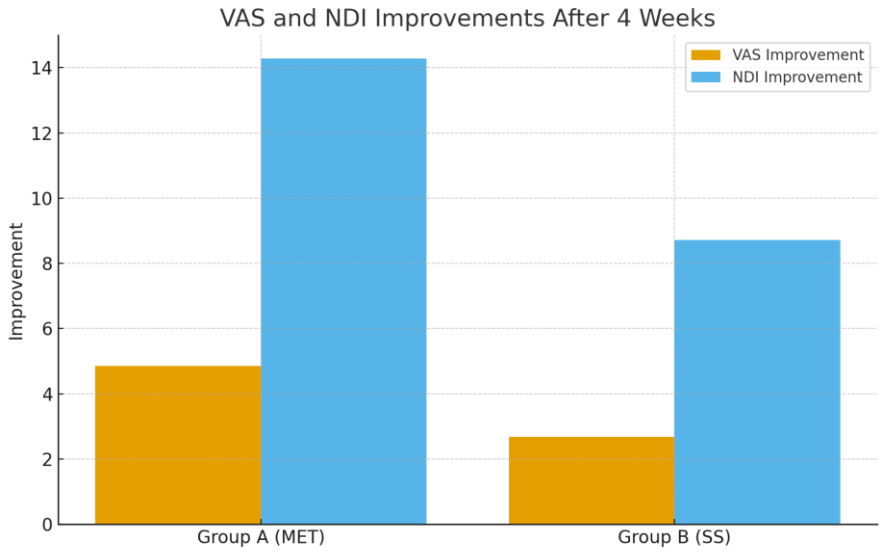
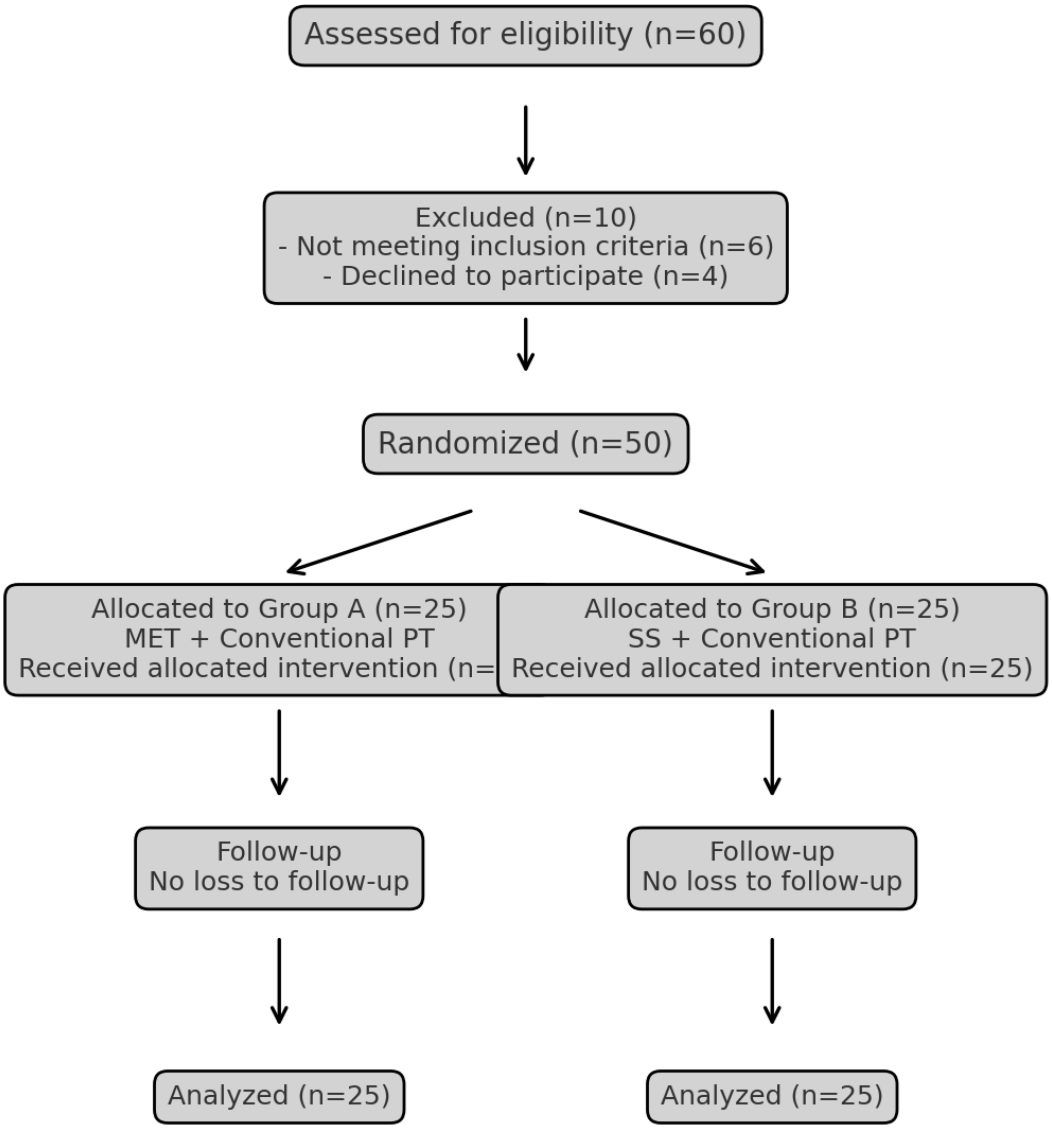


Figure 1: Comparative improvement in VAS and NDI scores for Group A and Group B.



CONSORT: Consolidated Standards of Reporting Trials

Figure 2: CONSORT flowchart of participant recruitment, allocation, and analysis.

Table1: Comparing the VAS Scores of Both the groups

Group	Baseline	2 Weeks	4 Weeks
Group A (MET)	6.36 ± 0.48	2.0 ± 0.6	1.5 ± 0.5

Group B (SS)	6.48 ± 0.65	4.5 ± 0.7	3.8 ± 0.6

Table 2: Comparing the NDI Scores of Both the groups

Group	Baseline	2 Weeks	4 Weeks
Group A (MET)	23.28 ± 2.3	12.0 ± 1.8	9.0 ± 1.5
Group B (SS)	23.72 ± 2.5	18.0 ± 2.0	15.0 ± 2.1

DISCUSSION

The findings of this pilot study demonstrated that both MET and SS, when combined with conventional physiotherapy, significantly improved pain, functional disability, and cervical ROM in young adults with mechanical neck pain. However, MET was superior to SS in all outcome measures. These results are consistent with previous studies, such as Phadke et al. [2] and Mahajan et al. [1], who found that MET was more effective in reducing pain and improving function compared to static stretching.

The superiority of MET may be explained by its neurophysiological effects, including post-isometric relaxation and autogenic inhibition, which reduce muscle hypertonicity and improve joint mobility [9]. Additionally, MET enhances circulation and proprioceptive input, thereby facilitating functional recovery [11]. In contrast, SS works primarily by viscoelastic creep and increased stretch tolerance [10], which may produce less immediate neurophysiological benefit compared to MET.

Similar findings were observed by Sbardella et al. [5] in their systematic review, which concluded that MET was beneficial in both acute and chronic nonspecific neck pain. Siddiqui et al. [6] compared autogenic and reciprocal inhibition MET techniques and found both to be effective, suggesting multiple variations of MET may provide benefits. Nazir et al. [8] highlighted the effectiveness of combining MET with deep neck flexor training, indicating that MET can be a valuable component in multimodal treatment.

The results of this study also support the findings of Ojoawo et al. [4], who found that MET provided greater disability reduction than SS. Furthermore, Jayaseeli et al. [9] demonstrated MET's superiority over McKenzie exercise and SS in student populations. These consistent findings across multiple studies strengthen the evidence for the use of MET in clinical practice for mechanical neck pain. [19-21]

Clinically, the findings imply that MET should be considered a preferred adjunct to conventional physiotherapy in young adults with MNP, particularly in populations exposed to poor ergonomics and sedentary work styles. [22-25] Incorporating MET into ergonomic and workplace physiotherapy programs may yield better outcomes for this demographic.

CONCLUSION

Both MET and SS were effective in reducing pain and disability and improving ROM, but MET showed superior outcomes. MET should be considered a preferred adjunct to conventional physiotherapy in young adults with mechanical neck pain.

Limitations

This was a pilot study with a small sample size, short duration of intervention, and single-center design. These factors limit the generalizability of the findings.

Future Scope

Future research should focus on larger multicenter randomized controlled trials with longer follow-up periods to confirm these findings. Incorporating digital physiotherapy and ergonomic workplace interventions may also be explored.

Declarations

Conflicts of Interest: None declared.

Funding: None.

Ethics Approval: Approved by Institutional Ethics Committee. Written informed consent was obtained from all participants.

REFERENCES

1. Mahajan R, Kataria C, Bansal K. Comparative effectiveness of muscle energy technique and static stretching for subacute mechanical neck pain. Int J Health Rehabil Sci. 2012;1(1):16–21.
2. Phadke A, Bedekar N, Shyam A, Sancheti P. Effect of muscle energy technique and static stretching on pain and functional disability in patients with mechanical neck pain: a randomized controlled trial. Hong Kong Physiother J. 2016;35:5–11.
3. Tank KD, Choksi P, Makwana P. Muscle energy technique versus Mulligan SNAGS for mechanical neck pain: a comparative study. Int J Physiother Res. 2018;6(1):2582–87.
4. Ojoawo AO, Ige B, Kunnuji K. Muscle energy technique and static stretching in patients with mechanical neck pain – a randomized study. Eur J Clin Exp Med. 2022;20(1):63–9.
5. Sbardella S, Petrelli L, Fusco A, Paoloni M. Muscle energy technique in the rehabilitative treatment for acute and chronic non-specific neck pain: a systematic review. Healthcare (Basel). 2021;9(6):746.
6. Siddiqui M, Satti MZ, Ahmad A, Sarfraz M. Effects of autogenic and reciprocal inhibition techniques

with conventional treatment in mechanical neck pain. BMC Musculoskelet Disord. 2022;23:668.
7. Zibiri RA, Akodu AK, Okafor UA. Effects of Muscle Energy Technique and Neck Stabilization Exercises on Pain, Psychological Status, and Sleep Disturbance in Patients with Non-Specific Chronic Neck Pain. Middle East J Rehabil Health Stud. 2019;6(2):e87192.
8. Nazir S, Shah A, Zahid M. To Compare the Effectiveness of Muscle Energy Technique and Deep Neck Flexors Training on Pain, Range of Motion and Functional Disability in Patients with Mechanical Neck Pain. Pak BMJ. 2022;5(1).
9. Jayaseeli P, Ali MA, Joseph J. Comparative effect of Muscle Energy Technique, McKenzie exercise, and static stretching in students with mechanical neck pain. J Acad Med Pract. 2024;6(3):161–70.
10. Shum GLK, Tsung BYS. Stretch tolerance, not changes in viscoelastic properties, improves flexibility after stretching. Clin Biomech. 2009;24(4):336–341.
11. Chaitow L. Muscle Energy Techniques. 4th ed. London: Churchill Livingstone; 2013.
12. Cagnie B, Dickx N, Peeters I, et al. The use of muscle energy technique in the treatment of patients with acute neck pain: a pilot RCT. Man Ther. 2007;12(1):64–71.
13. Ylinen J, Kautiainen H, Wirén K, Häkkinen A. Stretching exercises vs manual therapy in treatment of chronic neck pain: a randomized, controlled cross-over trial. J Rehabil Med. 2007;39(2):126–132.
14. Vernon H, Mior S. The Neck Disability Index: a study of reliability and validity. J Manipulative Physiol Ther. 1991;14(7):409–415.
15. Gross AR, Paquin JP, Dupont G, et al. Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 2015;(1):CD004250.
16. Childs JD, Cleland JA, Elliott JM, et al. Neck pain: Clinical practice guidelines. J Orthop Sports Phys Ther. 2008;38(9):A1–A34.
17. Price DD, McGrath PA, Rafii A, Buckingham B. The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. Pain. 1983;17(1):45–56.
18. Vernon H, Mior S. The Neck Disability Index: a study of reliability and validity. J Manipulative Physiol Ther. 1991;14(7):409–415.
19. Tousignant M, de Bellefeuille L, O'Donoghue S, Grahovac S. Criterion validity of the cervical range of motion (CROM) goniometer for cervical flexion and extension. Spine. 2000;25(3):324–330.
20. Bronfort G, Evans R, Anderson AV, et al. Spinal manipulation, medication, or home exercise with advice for acute and subacute neck pain: a randomized trial. Ann Intern Med. 2012;156(1):1–10.
21. Falla D, Jull G, Hodges P. Training the cervical muscles with prescribed exercise in patients with chronic neck pain: a randomized controlled trial. Spine. 2007;32(9):E347–E354.
22. Gross A, Langevin P, Burnie SJ, et al. Manipulation and mobilisation for neck pain contrasted against inactive controls or another active treatment. Cochrane Database Syst Rev. 2015;(9):CD004249.
23. Blanpied PR, Gross AR, Elliott JM, et al. Neck pain: revision 2017 clinical practice guidelines. J Orthop Sports Phys Ther. 2017;47(7):A1–A83.
24. Côté P, Wong JJ, Sutton D, et al. Management of neck pain and associated disorders: A clinical practice guideline. J Manipulative Physiol Ther. 2016;39(7):523–564.
25. Miller J, Gross A, D'Sylva J, et al. Manual therapy and exercise for neck pain: a systematic review. Man Ther. 2010;15(4):334–354.