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Case Report

Effect of post isometric relaxation technique in mechanical neck pain: a case study

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ABSTRACT

Neck pain is one of the most common musculoskeletal disorders among the population. The purpose of the study was to investigate the effect of muscle energy technique in the form of post isometric relaxation technique (PIR) on pain and range of motion in a patient with chronic mechanical neck pain (MNP). A 35-year-old woman with MNP was treated with PIR for 3 weeks. Neck pain and disability was measured using neck disability index scale (NDI) and numerical pain rating scale while ROM of cervical spine was measured with universal goniometer. The patient has significant decrease in pain and significant improvement in range of motion and functional disability using NDI showed improvement from moderate disability to mild disability. Post isometric relaxation technique is effective in reducing pain and functional disability and increasing cervical range of motion in mechanical neck pain.

Keywords: Post isometric relaxation, Neck pain, Muscle energy technique

INTRODUCTION

Neck pain is one of the most common musculoskeletal disorders in general populations. Its prevalence ranges from 14.27% to 71% in the general population at some time in their lives. Women are more likely to experience neck discomfort, and it often worsens after middle age. The economic burden of neck pain condition is large on health care system.[1]

Mechanical neck pain (MNP) is characterized by symptom of generalised pain of the neck and shoulders which are caused or precipitated by neck movements, sustained postures of the neck or manual pressure to neck muscles.[2] Symptoms of this condition are caused by mechanical or postural factors; the causes vary from poor posture, muscle tightness, occupational or sports activities to poor posture, depression and anxiety.[3]

Mechanical neck pain is diagnosed based on localized neck pain that is often aggravated by specific movements or postures. It limits the movement of the neck due to stiffness and reduces the muscle strength. Tenderness is noted on the palpation of the cervical muscles, muscle spasm or tightness in the neck and absence of neurological deficits are seen.[4] Imaging studies like X-rays and magnetic resonance imaging (MRI) were done to rule out other possible conditions or causes. In physiotherapy several special tests like compression test, Spurling's test, and cervical distraction are done to identify any underlying conditions such as facet joint dysfunction or disc related issues and outcome measures like neck disability index and questionnaires are used to assess the severity of neck pain.[5]

The purpose of this case study was to determine whether mechanical neck pain might be effectively treated using post-isometric relaxation techniques. Muscle energy technique (MET) involves a therapist applying a counterforce to the patient's muscles while they voluntarily contract them in a regulated manner.[6] MET has several potential medical applications, including pain relief, fascia and muscle stretching, increased blood flow to the area, muscular

strengthening, and the release of joint limitations. By applying an isometric contraction to the targeted muscle, which results in post-isometric relaxation, the MET helps to relieve the muscle's tension before stretching.[7]

Post isometric relaxation (PIR) is an MET technique which can lengthen and relax a shortened and hypertonic muscle. Postural muscles, which can become short and tight and cause imbalances in the body, are the usual targets of this mild stretching method.[8] Several muscles, including the trapezius and the levator scapulae, may have restricted range of motion and joint constraints as a result of multiple factors. Limitations in neck and shoulder mobility caused by shortened muscles are a common source of discomfort for the affected muscles. The treatment approaches for mechanical neck pain have evolved from passive techniques to more active methods. MET have been applied to both symptomatic and asymptomatic populations.[9]

CASE REPORT

A 35-year-old female patient who presented at a tertiary hospital in Southern Karnataka gave the history of neck pain on the left side since one month and the pain got increased since one week due to prolonged hours of computer work. The pain radiated from head to neck and she was having difficulty in turning to one side and bending the neck and movement was reduced in the neck. She visited to local hospital where medications were given, but since there was no improvement, she was referred for physiotherapy. Physiotherapy intervention was done for 1 hour per day, 5 days a week, over a period of three weeks.

Clinical findings

Patient underwent an initial examination which included demographic data, brief history of present illness and physical examination. Range of motion of cervical flexion was 30 degree and cervical lateral flexion was 25 degree and strength testing using manual muscle testing showed 3/5 in all cervical muscles. A compression test was performed and found to be positive on the left side cervical lateral flexion. According to numerical pain rating scale patient scored 8/10 which indicated severe neck pain and neck disability index score was 17/50 which indicated moderate neck disability.[3,4]

Treatment techniques

To relax the upper trapezius fibres after an isometric contraction, the patient was seated with neck and head flexed and bent away from the involved side, till just before the point of restriction. After stabilizing the shoulder with one hand, the patient was instructed to take the stabilized shoulder towards one ear while breathing in and holding, all while resisting effort on both sides. After that, the patient was instructed to exhale deeply, relax for three seconds, and then the shoulder was extended laterally for three seconds. The whole process was repeated five to ten times.

In addition to this, range of motion exercises and neck stretching exercises for the upper trapezius, levator scapulae and sternocleidomastoid muscles were performed to improve range of motion, reduce stiffness and pain. Additionally, neck isometric exercises were done to strengthen these muscles.

DISCUSSION

This study was conducted on patients with persistent mechanical neck discomfort, and aimed to examine the efficacy of MET in the form of PIR in conjunction with conventional physical therapy for pain and mobility. We found that patients with persistent myofascial pain (MNP) benefited greatly from treatment when they added MET in the form of pre-intervention relaxation (PIR) to a conventional physical therapy program that already included ROM exercises and isometric strengthening.[10]

In this study, post isometric relaxation technique, neck range of motion exercises, neck stretching and neck isometrics were given for 10-15 repetitions for duration of three weeks. The initial pre-assessment was taken before the treatment began and post-intervention data was collected after 4 weeks by using outcome measures. On the NPRS, patient scored 8/10 i.e. severe neck pain in the pre-intervention whereas 3/10 i.e. mild neck pain in the post- intervention. On the NDI, patient scored 17/50 i.e. moderate disability in the pre-intervention whereas 5/10 in the post-intervention i.e. mild disability. Patient's cervical range of motion was improved from 25 to 40 degrees in cervical lateral flexion and from 30 to 45 degrees in cervical flexion. Additionally, the muscle strength was improved from 3/5 to 4/5 in all cervical muscles, measured using manual muscle testing.

Mechanical neck pain refers to discomfort or pain in the neck. It arises insidiously and is generally multifactorial in origin. It can be felt locally in the neck; arm or shoulders and worsened by resting the head in one place for a significant period of time. Those with MNP can experience the constriction of head mobility, limited neck movements, neck stiffness as well as muscle spasms and tightness. MNP can also cause headaches.[10] Improper posture, which often results from excessive pressures and strain on the neck musculature, is the primary cause of MNP. MNP can subside within one month. Other type of neck pain results from nerve compression or damage, such as herniated disc or spinal stenosis and caused by trigger points in the muscles. MNP is generally related to muscular and postural issues which can be managed with non-invasive treatments like physical therapy, ergonomic adjustments and tractions. Other types of neck pain such as radiculopathy, myofascial pain

syndrome and cervical spondylosis may have more complex causes and require a broader range of treatments.[11]

Post isometric relaxation technique (PIR) is a form of manual therapy which quickly relaxes muscles as it lengthens tight muscles and strengthens weak muscles by engaging the muscle in an isometric contraction before relaxation; it triggers a neurological response that helps release tension rapidly. It can help in reduce pain associated with muscle tightness, spasms by promoting blood flow to the affected area and releasing trigger points. It increases range of motion of restricted joint by promoting relaxation and flexibility in targeted muscles.[12]

Post isometric relaxation technique is used in osteopathy, physiotherapy and chiropractic care. It involves a patient contracting a muscle isometrically (without movement) against resistance, followed by a period of relaxation and gentle stretching of the muscle. PIR is relatively simple to perform and doesn't require advanced equipment. It also helps in reducing muscle pain and tension, provides relief for patients with conditions like muscle spasm and stiffness. It improves flexibility by gently stretching the muscles after isometric contraction; PIR can enhance muscle flexibility and joint range of motion. PIR technique can help improve muscle function by increasing blood flow and promoting relaxation of tight muscles. Considering the results of the present study, PIR can be considered an easy to administer treatment for mechanical neck pain.[12]

Limitations

This study was limited by the single case study design and absence of long-term evaluation of the outcomes. Other studies with larger sample sizes and longer duration are recommended.

CONCLUSION

Adding muscle energy technique in the form of post isometric relaxation treatment was effective in reducing pain and functional disability and increasing cervical range of motion in a patient with mechanical neck pain.

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REFERENCES

1. Yadav H, Goyal M. Efficacy of muscle energy technique and deep neck flexors training in mechanical neck pain – A randomized clinical trial. Int J Therap Rehab Res. 2015;4:52-66.
2. Siddiqui M, Akhter S, Baig AA. Effects of autogenic and reciprocal inhibition techniques with conventional therapy in mechanical neck pain- a randomized control trial. BMC Musculoskelet Disord. 2022;23(1):704-10.
3. Khanb ZK, Ahmed SI, Baig AA, Farooqui WA. Effect of post isometric relaxation versus myofascial release therapy on pain, functional disability, range of motion and QOL in the management of non-specific neck pain: a randomized controlled trial. BMC Musculoskelet Disord. 2022;23(1):567-82.
4. Gupta S, Jaiwai P, Chhabra D. A Comparative study between post isometric relaxation and isometric exercises in non- specific neck pain. J Exerc Sci Physiotherap. 2020;4(2):88-94.
5. Osama M. Effects of autogenic and reciprocal inhibition muscle energy techniques on isometric muscle strength in neck pain: A randomized controlled trial. J Back Musculoskelet Reha. 2021;34(4):555-64.
6. A Ghulam HS, Alqhtani RS, Aishahrani A, Ahmed H, Khan AR, Khan. Efficacy of cervical mobilization with post isometric relaxation in managing mechanical neck pain, ROM and functional limitations associated with myofascial trigger points. Medicine. 2023;102(52):e36710.
7. Joshi R, Rathi M. Effect of muscle energy technique versus positional release technique on pain and functions in patients with trapezitis. A comparative study. Int J Sci Res. 2017;6:2113-5.
8. Manzoor A, Anwar N, Khalid K, Haider R, Sagir M, Javed MA. Comparison of effectiveness of muscle energy technique with Mulligan mobilization in patients with non- specific neck pain. JPMA. J Pak Med Assoc. 2021;71(6):1532-4.
9. Jeong HM, Shim JH, Suh HR. The passive stretching, massage and muscle energy technique effects on range of motion, strength and pressure pain threshold in musculoskeletal neck pain of young adults. Phys Therap Rehab Sci. 2017;6(4):196-201.
10. Kumari C, Sarkar B, Banerjee D. Efficacy of muscle energy technique as compared to proprioceptive neuromuscular facilitation technique in chronic neck pain: A randomized controlled trial. Int J Health Sci Res. 2016;6:152-61.
11. Rodriguez-Huguet M, Rodriguez-Almagro D, Rodriguez-Huguet P, Martin-Valero R, Lomas-Vega R. Treatment of neck pain with myofascial therapies: A single blind randomized controlled trial. J Manipulative Physiol Therap. 2020;43(2):160-70.
12. Guo Y, Luv X, Zhou Y, Li Z, She H, Bai L, Bao J. Myofascial release for the treatment of pain and dysfunction in patients with chronic mechanical neck pain: Systematic review and Meta –analysis of Randomized Controlled Trial. Clin Rehab. 2023;37(4):478-93.

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