



# **Effectiveness of Self-Administered Proprioceptive Neuromuscular Facilitation with Self-Neural Mobilization Technique in Trapezius Myalgia: Single Subject Research**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors AB and BD conceptualized and took the case. Authors AB and RH designed the methodology and implication of treatment. Author BD assisted in documenting the case. Authors AB, BD and RH wrote the manuscript. All the authors previewed and approved the case report before submission.*

## **Article Information**

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**Case Report**

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## **ABSTRACT**

**Background:** Trapezius myalgia or the inflammation of the trapezius muscle is the most common condition leading to a pain and spasm in the cervical region. This is often referred to as trapezius myalgia. Individuals having long working hours on desktop are the most subjected to develop this condition. It could result in slight discomfort to severe pain which may lead to suboccipital muscle tightness as well.

**Investigations:** On the day of examination patient presented with severe pain and spasm in the muscles of upper back and neck. The range of motion was found to be reduced for cervical region on examination with goniometer. No radiological findings were available with the patient.

**Case Presentation:** A 23 years old female patient presented with a complaint of pain in right upper back and at times in the left upper back with intermittent radiation in the arm. Presenting with a history of pain on prolonged sitting, studying.

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**Discussion:** Self proprioception neuromuscular facilitation (PNF) stretching technique along with self neural mobilization was the main physiotherapeutic intervention. The outcome measures for pain and tightness showed significant improvement.

**Conclusion:** Self PNF stretching was found to be effective in patients with severe pain referring to arms along with the tightness, when traditional mode of treatment cannot be performed due to presence of extremely painful condition.

*Keywords:* Trapeziusmyalgia; self PNF; neural mobilization; single subject research.

## 1. INTRODUCTION

Prolonged sitting activities are often associated with an increase in activation of the postural muscles. This often leads to excessive strain on the muscles around the scapula [1]. Trapezius muscle is generally the first and most commonly affected which ultimately leads to tightness of the muscle, formation of adhesions and trigger points [2]. Lack of any physical activity adds on to the risk of developing tightness and pain in the muscle, which may then radiate to the neck, upper back and arm. Traditional intervention used for the treatment of the same, are stretching, moist pack, TENS, massage techniques and many more [3]. In some cases, the area of pain is extremely tender and the patient doesn't allow therapist to even touch. In this study in order to reduce the pain self PNF along with neural mobilization technique is used [4]. We are reporting a case of 23-year-old female patient who developed trapezius pain associated with prolonged sitting with the complaints of pain in upper back referring to both arms along with tightness of the same muscle [5].

## 2. CASE PRESENTATION

Patient was 23yrs old female. She was a student by occupation and had to sit for nearly 6 hours/day working on laptop. Any activity that required prolonged sitting, like working or studying had become difficult for the patient.

Patient's primary complaint was pain in both right and left upper back for 3 years and secondary complaint was of pain referring to both the arms for 1 year. Pain of the patient was intermittent, aggravated on prolonged working or studying with the neck in flexion, without proper back support and it was relieved on rest or by using moist pack for 15 minutes.

### 2.1 Patient Perspective

The patient shared her perspective that compared to the day one she found her neck

pain and its referral to the arms to reduce 5 on NPRS scale from 8. After 7 days of treatment her pain got reduced by 3 on NPRS along with slight increase in the ROM.

### 2.2 Scientific Rationale

Trapeziusmyalgia is the complaint of pain, stiffness and tightness of upper trapezius characterized by acute or persistent upper back pain with trigger points referring into arm due to constrained work postures leading to sustained static contraction of the muscle ultimately leading to muscle fatigue. Diagnosis was done on the basis of presence of pain, trigger points, tightness and spasm for which outcome measures used were NPRS pain rating scale and ROM assessment for recording tightness.

As an appreciation of the interrelationship between upper trapezius muscle length and upper quadrant neural tissue extensibility, self-neural tissue mobilization was used in this case as upper trapezius and nerves of the brachial plexus share common anatomical orientation and thus extensibility of 1 component is interrelated to another that is reduced neural extensibility had significantly decreased length of upper trapezius.

Self-PNF stretching technique is used in this case as it is found to decrease the symptoms by stimulating both myoreceptors and exteroceptors which promotes motor-skill memory and neurophysiological changes ultimately increasing ROM and pain threshold, decreasing pain and improving tightness.

### 2.3 Clinical Findings

On objective examination Pain of the patient was 8 on NPRS. Posture analysis with the plumb line: On lateral view forward head and reduced cervical lordosis was observed. Tightness of Trapezius, levator scapulae, pectoralis major and minor muscle was seen. Muscle spasm was assessed using the method of palpation bilaterally with the inference that it was present in upper trapezius muscles. Resisted isometrics

were strong and painful for major muscles of cervical region which are cervical flexors, extensors and lateral flexors. Cervical joint range of motion was restricted with tissue stretch end-feel. According to MMRC scale cervical and shoulder muscle strength was grade 4. Joint play was found to be grade 3 for cervical joints. Pre-examination requisite – Assessed for red flag signs such for Vertebral Artery Insufficiency, history of cervical fractures or neoplastic condition.

### 3. DIAGNOSTIC ASSESSMENT

There was no radiological diagnostic testing. As the patient had no radiological findings, she did not face any diagnostic challenges.

#### 3.1 Diagnosis

Diagnosis was done on the basis of subjective and objective examination for Trapezius Myalgia. Functional diagnosis is the reduced range of cervical motion with trigger points.

#### 3.2 Prognosis

The physiotherapy treatment was more of biomechanical correction and patient's prognosis was considered to be good

### 4. THERAPEUTIC INTERVENTION

Self PNF stretching accompanied by self-neural mobilization technique was given in 3 sets. In one set 5 seconds hold was incorporated. The patient was asked to perform rotation of cervical spine on left side with extension then with flexion and right arm abduction with elbow extension, finger flexion and wrist flexion with either radial deviation or ulnar deviation to facilitate nerve glide. Same protocol was followed for rotation of the neck on right side with flexion and extension along with neural mobilization of left arm. Patient was educated about the self-stretching methods and practiced initially under supervision of therapist and later on it was continued by patient himself as he was better doing it. The range of motion then was maintained as the patient is aware about the self-stretching methods.

#### 4.1 Procedure

A treatment session of 2 days was given with 5 sec hold and 3 reps with the gap of 7 days, in

which the patient was asked to follow the commands to perform self PNF stretching and self-neural mobilization in sitting position under supervision. There was an immediate effect on the reduction of the symptoms of the patient which were pain, tightness, and referral of pain in both the arms after the 1<sup>st</sup> session of the treatment. After a gap of 7 days patient was called for the 2<sup>nd</sup> session and similar procedure was followed after which patient's symptoms were minimized as compared to the day of assessment. Outcome measures used for the evaluation of the symptoms were NPRS scale for pain and ROM assessment for tightness.

#### 4.2 Follow-up and Outcomes

Outcomes used were NPRS scale, and joint ROM. Immediate effect of self PNF stretching accompanied by opposite arm self-neural mobilization in reducing the referral of pain and tightness was seen. After 1<sup>st</sup> session of the treatment, immediate effect on pain was 5 on NPRS and increase of 5° in ROM and after 2<sup>nd</sup> session with the gap of 7 days, pain was 3 on NPRS and increase of 7° in ROM.

**Table 1. NPRS and ROM**

| SESSIONS            | NPRS | ROM |
|---------------------|------|-----|
| day 0               | 8    | 25° |
| day 1 <sup>st</sup> | 5    | 30° |
| day 2 <sup>nd</sup> | 3    | 37° |

##### 4.2.1 Intervention adherence and tolerability

Patient was cooperative.

##### 4.2.2 Adverse and unanticipated events

There were no adverse and unanticipated events

##### 4.2.3 Strength associated with the case report

Treatment approach used can be effective in the patients having severe tenderness that they do not allow the therapist to touch the affected area hence in order to relieve the symptoms of such patients few self-techniques can be incorporated.

##### 4.2.4 Weakness associated with the case report

Insufficient number of treatment sessions.

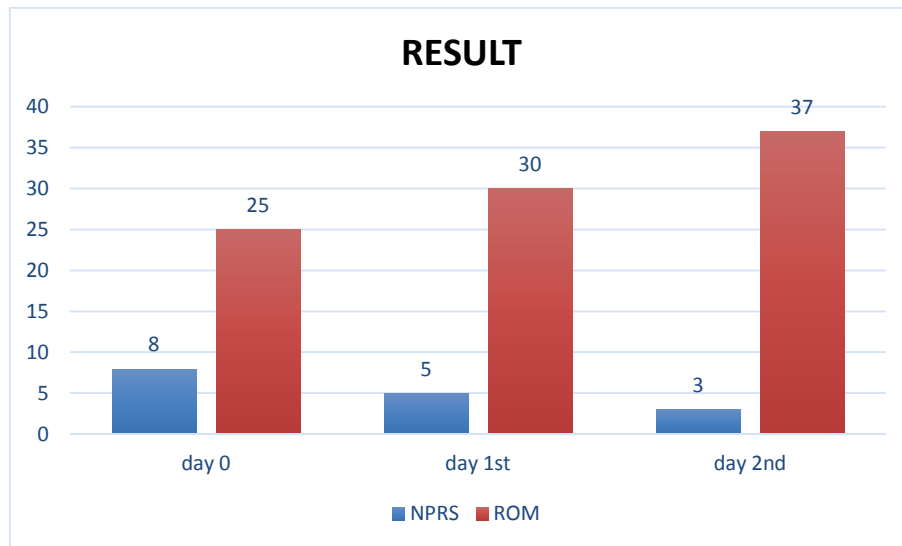


Fig.1. Result for NPRS and ROM

## 5. DISCUSSION AND CONCLUSION

Muscles are most frequently exposed to structural damage due to excessive fatigue or improper movements as they are most dynamic and important structures to maintain posture and perform any movement [6]. Functional activities can only be performed when muscle, bone, ligaments all function together but when these structures are affected, normal functioning of the body hampers leading to several symptoms as all these structures are interrelated [4].

Upper trapezius and nerves of the brachial plexus share common anatomical locations so as per the researches, reduced neural extensibility has significantly less measured length of trapezius measured by ULTT [7] therefore they concluded that extensibility of upper trapezius is related to extensibility of neural structures. With the reference of this article in the present study we have used self-neural tissue mobilization technique for improving the length of trapezius to reduce symptoms [8].

Along with this, many PNF studies have found to be effective in controlling inappropriate muscle function by relieving pain, ROM and increasing pain threshold by improving the efficiency of nerve controlling the muscle, tone and circulation and also improves muscle endurance and flexibility by stimulating both myoreceptors and exteroceptors[9]. Jung-Ho-Lee et al used passive PNF stretching along with stabilizing exercises and concluded the effect of this combination in

the patients with trapeziusmyalgia. A study conducted have concluded that self-administration of PNF can improve both flexibility and ROM [10].

The present study examined the effect of only self PNF and self-neural mobilization in reducing the symptoms of trapeziusmyalgia when tenderness is so severe that patients doesn't allow the therapist to physically contact [11].

## CONSENT

As per international standard or university standard, patients' informed consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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