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EXPLORING THE ROLE OF NEUROSCIENCE PAIN EDUCATION IN MANAGING TRISMUS-RELATED DISCOMFORT

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Abstract:
This is a case report. Trismus (restricted mouth opening) is a symptom that affects more than one third (38–45%) of patients treated with radiotherapy for head and neck cancer (HNC). Trismus leads to difficulties with chewing, swallowing, pain and poor oral hygiene. Furthermore, trismus can have a negative impact on health-related quality of life (HRQL). The effect of pain neuroscience education has been shown to be effective in reducing pain improving function and lowering fear and catastrophization.
Case presentation: patient was 46-year-old man, clerk by occupation. He had pain at jaw and difficulty in opening mouth for 4 years. More pain on the left side of face. The pain was continuous, chronic and stabbing pain which was aggravated by opening and chewing of mouth. He was having pain at neck with tightness of upper trapezius, levator scapulae and sclene muscles. He is having sever restricted range of motion of temporomandibular joint and somewhat restriction in cervical range of motion, after his last radiation session for tongue. In this study, intervention given was electrotherapy, manual therapy, MFR and focused more on pain neuroscience education [PNE]. After two month of physiotherapy treatment pre and post outcome for pain on visual analogue scale and range were measured using maximum interincisal distance [MID].
Conclusion: We conclude that, exercises therapy, electrotherapy and PNE is effective in terms of pain and improving symptoms of patients with trismus. So, this intervention is indicated in long term management of radiation induced trismus.

Keywords: *Trismus, PNE, MFR, exercises therapy, electrotherapy.*

1. INTRODUCTION

Trismus (restricted mouth opening) affects more than one third (38–45%) of patients treated with radiotherapy for head and neck cancer (HNC)[2]. Trismus leads to difficulties with chewing, swallowing, pain and poor oral hygiene. It can have a negative impact on health-related quality of life (HRQL). The consequences of temporomandibular joint dysfunction will be pain, limitation of mouth opening, functional disability and poor quality of life (Qol)[3].

The number of patients suffering from temporomandibular joint dysfunction (TMD) has been increased dramatically. It has been reported that 8 out of 10 patients seek health care primarily from a dentist complaining of symptoms that are diagnosed as bruxism or TMD. TMD is known as a group of disorders that affect the temporomandibular joint (TMJ), the masticatory system, or both, and may even extend to involve the surrounding related structures[4].

The Pain is a natural occurrence in humans and is necessary for survival. However, coping with pain is not common and generally culminates in finding help with suffering[5].Pain is a strong driving factor that drives the patient's behavioural treatment. For patients with LBP, multiple educational methods are promoted, including

biomechanical back school style of education, evidence-based guideline training, cognitive behavioural therapy, and neuroscience education[6].

The purpose of PNE is to change the patient's misconceptions and maladaptive thoughts regarding pain (Meeus et al., 2010)[1]. Hence, in this study we implemented the PNE along with manual therapy, electrotherapy and exercises therapy to improve patient's range of motion for TMJ, and reduce pain in patient with trismus.

Patient information:

Patient was 46-year-old man, clerk by occupation. 7 years back he felt a lump over tongue so he visited doctor, after investigations such as PET scan he diagnosed with tongue cancer. At that time, after operation he took 32 radiation sessions. But in year 2020, again he faces the same problem so he took 7 chemo and radiation for 3 months. In between these last chemo sessions, he started facing difficulty in mouth opening as well as chewing the food. After last radiation doctor referred him for physiotherapy treatment with chief complaint of pain and difficulty in mouth opening.

Clinical findings:

Pain was 8 during mouth opening and 3 on rest on the VAS, which was more on the left side of the face over temporo mandibular joint. The pain was continuous in nature throughout the day and night. Pain used to Aggravate by chewing movement. Surgical history was present as 1st surgery done for Right lateral side of tongue cancer in year 2014 and 2nd surgery performed for recurrent malignancy in left buccal mucosa with mandilectomy in2016. Posture evaluation done in Lateral view, suggested the patient presented with Rounded shoulders and Forward head posture **Subjective examination:**

Patient is having Tightness over trapezius, levator scapulae, and scalene muscles. Tenderness was present at left TMJ (grade 2). cervical ROM was measured using goniometer revealed limited range for flexion, extension and lateral rotation and side bending to contralateral side. Range of Temporo-mandibular joint was measured using maximal inter incisional distance (MID), which shows mouth opening 0.7 cm i.e. MID Grade1. Scar was extended from left side of face till mid neck which was healed and non-adherent in nature.

Diagnosis Assessment

Whole body PET CT scan was done for evaluation of disease status of diagnosed carcinoma of left buccal mucosa with chemo radiations now with suspected recurrence

Diagnosis

Diagnosis was done on the basis of subjective and objective examination for trismus. The treatment for physiotherapy concentrated more on myofascial release, temporomandibular joint manual therapy, electrotherapy and more on pain neuro education.

2. THERAPEUTIC INTERVENTION

In Electrotherapy treatment the patient was given conventional mode TENS for 20 minutes and they were given active jaw exercises before and after the application of the modality[9]. for the Manual therapy intervention, maitland mobilization for cervical spine and TMJ, mayofacial release over occiput and temporo mandibular joint performed. In Pain Neuroscience Education session, the treatment given for two session each weak. lastly in the Exercises therapy group: trapezius and levator scapulae stretching, chin tucks, shoulder shrugs, shoulder bracing exercises.

From first week, we started giving him Pain education two session per week along with the previous treatment. Pain education consists of a biopsychosocial approach that demystifies behavioral fears and beliefs about pain and movement, explains how pain is not always involved with tissue damage or degeneration and how biological, psychosocial and cognitive factors influence in pain perception. On hir first session of pain science education, he

receives a structured lecture with the main points of this approach as: How pain is important to our lives? Pain is a good thing, like an alarm which warns us that something could be wrong. What are the factors that contribute to pain cornification? The importance of psychosocial factors (stress, anxiety, kinesiophobia, etc.) in the pain cornification. The contribution of lack of sleep and mouth opening during TMJ pain, and daily movements; Neurophysiology of pain. In the other sessions was done the reinforcement of the themes covered in the first session, focusing where individuals have more difficulties to change.

3. FOLLOW UP AND OUTCOME MEASURES

Intervention was given for 6 weeks along with home exercises program. Physiotherapy treatment session was given for five days a week, at physioterhapy OPD and PNE session was given twice a week to the patient before exercises treatment.

Outcome measures taken were for Pain visual analogue scale (VAS), Range of motion- cervical goniometery. And the Mouth opening was measured using maximum inter-incisal distance (MDI).

OUTCOME MEASURES	1st week	6th week
• VAS	8	3
• MID	Grade 1 (0.7cm)	Grade 2 (1.5cm)
Cervical ROM • flexion	0-40 degree	0- 70 degree
• extension	0-30 degree	0 to 60 degrees
• Rotation to right side	0 to 30 degrees	0 to 50 degrees
• Side flexion to right side	0 to 5 degrees	0 to 15 degrees

Intervention adherence and tolerability-

The patient conformed very well to number of days of physiotherapy. The patient participated well by focusing on physical therapy and exercises.

Adverse and unanticipated events-

No harmful or unexpected incidents have occurred.

Strength associated with case report-

In addition to minimizing local symptoms, the therapeutic strategy centred on pain, range of motion, muscle tightness, pain neuroscience education in the patient focuses more on what pain is, the meaning of pain experiences, or optimistic outlook on life. Our primary emphasis is therefore on the patient's experience of pain, the importance of pain thoughts**,** stress management and physical activity. Performed this educational approach.

Weakness associated with case report-

Lack of understanding about pain neuroscience education [PNE].

4. DISCUSSION

In the case of trismus there is a risk of mastication muscle contracture and atrophy, and TMJ fibrosis resulting in reduced mandibular range of motion. There is activation of the muscles of mastication and stretching of the TMJ can counteract shortening of muscles, maintain circulation and increase the range of motion of the TMJ. The PNE model explains stress, anxiety, fear avoidance, and kinesiophobia and their effects on the pain experience, Awareness of this relationship, that expected to reduce symptoms of pain in patients.

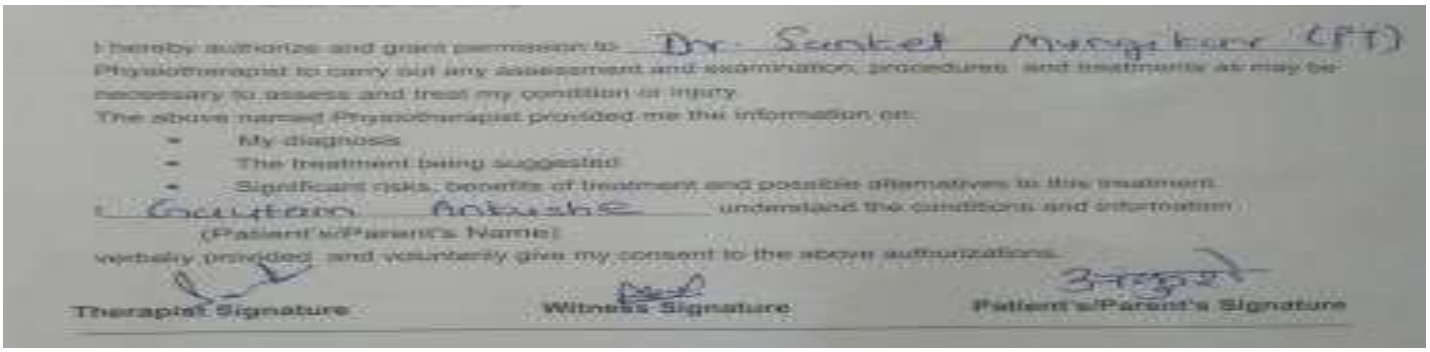
Education in pain neuroscience can decrease kinesiophobia, pain, anxiety, pain behaviour in response to pain management, physical harm, and medication. To decrease the psychological element, PNE is superior counselling[7]

A study done by sethil kumar et al in year 2019 concluded that conventional mode tens maybe useful in relieving the pain associated with forced mouth opening exercises aimed at overcoming trismus caused by muscle spasm or in oral cancer patients which is in turn associated with prolonged immobilization of the jaws.

D. W. OH, et al studied, The effect of physiotherapy on post temporomandibular joint surgery patients During the 3–6week period after surgery, a moist hot pack was applied to each subject, followed by 5 min of ultrasound . In addition, an exercise programme recommended by Bertolucci (1992), Waide et al. (1992) and Oh et al. (1999) consisting of postural correction, isometric, active-assistive and self-stretching exercises, was carried out. Furthermore, a rhythmic stabilization for neuromuscular re-education was applied as well. On the assessment performed 7 months after surgery, all variables were significantly lower for the treatment group compared with those of the non-treatment group. The findings of the study indicate that physiotherapy has a positive effect in relieving pain and restoring TMJ function after surgery[8]. The purpose of administering treatment after TMJ surgery is to restore the normal joint function by relieving pain and inflammation, reducing swelling, minimizing joint loading, preventing joint contracture and adhesion formation and facilitating condylar movement (Waide et al., 1992; Kuwahara et al., 1994).

Exercises therapy, electrotherapy along with PNE is effective in terms of pain and improving symptoms of patients with trismus. So this intervention is indicated in long term management in radiation induced trismus patient.

Informed Consent:


I hereby authorize and grant permission to Dr. Sanket Mayekar (PT)
Physiotherapist to carry out any assessment and examination, procedures, and treatments as may be necessary to assess and treat my condition or injury.
The above named Physiotherapist provided me the information on:
- My diagnosis
- The treatment being suggested
- Significant risks, benefits of treatment and possible alternatives to this treatment.

I Gaikwad Ankush understand the conditions and information
(Patient's/Parent's Name)
verbally provided and voluntarily give my consent to the above authorizations.

Therapist Signature | Witness Signature | Patient's/Parent's Signature

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