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A Research Protocol on Effectiveness of Sub Occipital Myofacial Release on Functional Disability in Temporomandibular Dysfunction with Neck Pain: A Randomized Control Trial

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Temporomandibular joint dysfunction is one of commonest joint that gets affected in females, studies shows that the altered posture of cervical spine lead to mandibular retrusion and hence in long term leads to Temporomandibular dysfunction, the tightness of sub-occipital muscle leads to pulling of the ligaments around the joint in course causing retrusion or malocclusion. The common symptoms of temporomandibular joint dysfunction includes clicking, reduced mouth opening, headache. Alteration in the function of TMJ leads to poor quality of life of the individual as this joint is involved in basic activities like talking, eating, laughing and kissing. The sub-occipital muscles are the group of muscle extending from spinous process of C2 vertebrae to inferior nuchal line of occipital bone. Tightness of this muscle lead to extension of upper cervical spine and flexion of lower cervical spine. The common causes of temporomandibular dysfunction includes injury to jaw, overuse, inflammatory condition like arthritis and bruxism. Our aim is to find out the efficacy of sub-occipital Myofacial Release versus conventional physiotherapy on functional disability of TMJ. The clinical trial registry-India (CTRI) registration number for this trial is CTRI/2021/05/033493.

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Methodology: In this study the total of 60 patients with mild to moderate Temporomandibular dysfunction with neck pain were divided into two group one group received MFR and other group received stretching exercises followed by conventional physiotherapy. The treatment was given for two week 5 session in each week. The assessment was done at day one of treatment and the end of first week and at the end of second week.
Discussion: This study was done to find out the effectiveness of suboccipital Myofacial release and stretching exercises in mild to moderate Temporomandibular joint dysfunction with neck pain.
Conclusion: Conclusion of the study can be made based on the effect of both technique on functional disability in patient with mild to moderate TMD and opt for more specific treatment for rehabilitation of patient with TMD.

Keywords: Temporomandibular joint dysfunction; sub occipital muscle; Myofacial release.

Clinical Trial Registry of India (CTRI) with ref. no. REF NO. 2021/04/043215.

1. INTRODUCTION

Temporomandibular Joint Dysfunction are more common in females than males [1]. The definition of Temporomandibular Dysfunction according to the diagnostic criteria for TMD (DC/TMD) is a discomfort or complaints in muscles (myalgia of TMJ muscles), pain in the Temporomandibular joint (TMJ arthralgia) of functional complaints like clicking and locking of the Temporomandibular Joint (TMJ) [2]. TMD is historically associated with dental malocclusion [3]. However dentists believe that TMD is related to TMJ clicking and can be best treated by occlusional adjustment or selective grinding [4]. The problems related to TMJ begins early in life the symptoms are not present till adult years [5]. Studies shows that the relation of TMJ pain is associated with the abnormality in the posture of the cervical spine most commonly forward head which leads to class II malocclusion of the stomatognathic system which further lead to Temporomandibular dysfunction [6]. In particular TMJ has a muscular and ligementous connection to the cervical spine forming a functional complex known as 'cranio cervical' – mandibular system.

Forward head is caused by tightness in the sub occipital muscles there is extension at C1 and C2 cervical spine and flexion at C3- C7 cervical spine with leads in tightness of sub occipital muscles [7]. The patient presentation of forward head includes significant mandibular retrusion, mandibular size deficiency. The sub occipital muscles consists of rectus capitis posterior major and minor, obliqus capitis superior and inferior. A report suggest that the occurrence of trigger point in sub occipital muscles was more as compared to other cervical muscle in patient with TMD [8]. The TMJ dysfunction mostly occurs because of any injury to jaw, overuse of muscles or inflammatory condition like arthritis, and bruxism the symptoms includes headache, limited mouth opening, muscle spasm, tinnitus, fullness in ears, cervical spine dysfunction and altered craniovertebral angle seen as forward head posture [9].

Conventional Physiotherapy treatments used to treat forward head include postural correction exercises and stretching exercise, manual therapy along with hot fermentation are given to reduce pain, improve range of motion, reduced muscle spasm and tightness, improve strength, and breaking down adhesion and enhance patient condition [10].

The fascia is ubiquitous covering soft tissue and organ. Tightening of the fascias a histological, physiologic and biomechanics protective mechanism that occurs in response to trauma or faulty alignment, the fascia solidifies and loses its resilience. Myofacial release is a hands on soft tissue technique that facilitates a stretch into restricted fascia. A sustained pressure is applied on the tissue for 90-120 seconds post that the tissue will undergo histological length changes allowing first release to be felt. The same procedure is repeated in the new tissue barrier. After few Myofacial release sessions the tissue will take the pressure off the pressure sensitive structure like blood vessels, Nerves, along with restoring the alignment and mobility of the joint [11].

A study is done on upper trapezius, sternocleidomastoid, temporalis and massater to find out the effect of Myofacial release on these muscles. No such study is done on sub occipital muscle so the need of the study is to compare Myofacial Release Technique and Conventional Physiotherapy on mild to moderate

Temporomandibular dysfunction with neck pain.

The aim of the study is to find the efficacy of Sub occipital Myofacial Release technique (MFR) on Functional Disability in patients with mild to moderate Temporomandibular Joint Dysfunction with Neck Pain.

2. MATERIALS AND METHODOLOGY

2.1 Material Required

1. Plinth, pillow.
2. 15 cm scale
3. Pen and paper for recording the assessment.

2.2 Methodology

Study Type: Interventional study.

2.3 Study Design

This study will be carried out in the OPD setting of Ravi Nair Physiotherapy College and AVBRH, Sawangi (Meghe), Wardha. We have also Register with the Clinical Trial Registry of India (CTRI) with ref. no. REF NO. 2021/04/043215. All participants will be educated about the details of the intervention, research and data confidentiality prior to the start of the study. Those participants who will satisfy the inclusion criterion will have to sign an informed consent before participation. Those (n =60) who full fill the inclusion criteria will then be included in the study for a duration of 2 weeks.

Study Setting: Department of Musculoskeletal OPD, Ravi Nair College of physiotherapy, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, India.

Study Population: Individuals with mild to moderate TMD, Forward head and neck pain.

2.4 Sample Size Calculation

The sample size was calculated using Cochran formula. 30 individuals in group A and 30 individuals in group B.

Cochran Formula:

$$N = \frac{Z\alpha^2/2 \cdot P\ (1-P)}{e2}$$

Where,

α is the level of significance at 5%. i.e 95% confidence interval=1.96 P is proportion of joint sound

=8.2% =0.082

e= error of margin=10%=0.10 $n = \frac{1.98 \times 0.082 \times 11-0.821}{0.102}$

=28.91

=30 in each group

Sample Size: 60 [12].

2.5 Inclusion Criteria

The individuals within 18-50 years of male and female, diagnosed with moderate and mild affection of TMJ (fonseca questionnaire).

2.6 Exclusion Criteria

Individual who have taken any dental treatment, any steroid infiltration or has undergone any recent TMJ surgery.

2.7 Participants Timeline

The duration of the study is 1 year and the duration of the intervention is 2 week so participant will be enrolled during first 11 months of study so 2 week intervention will be completed successfully. Assessment will be done on 1st day of visit then in midway (1st week) and end (2nd week) of intervention.

2.8 Implementation

Research coordinator and principal investigator will supervise randomization. Participants will be asked to manually select from the envelope, sealed group allocation for the recruitment into either group.

2.9 Blinding

Tester(s) will be blinded to assign the subjects to the group. To ensure binding, subjects will be mandated not to reveal any details of their treatment to the tester.

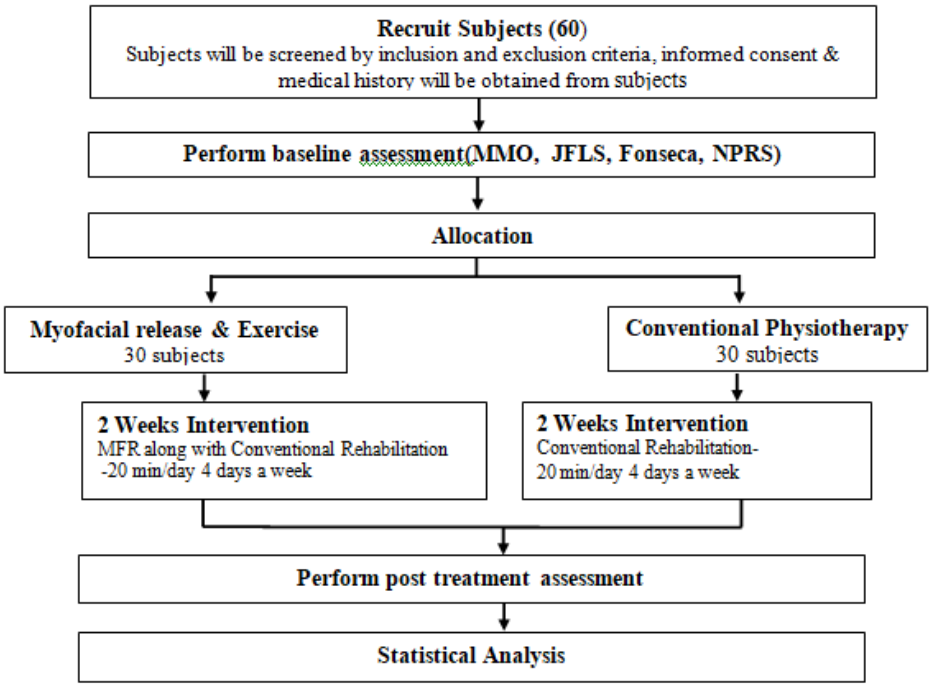

Fig. 1. Randomization: using chit method

Dependent Variables: pain and functional disability.

Independent Variables: Stretching and Myofacial Release Technique.

Procedure:

Assessment of the patient was started after approval from the concerned authority individuals are first screened on the basis of inclusion and exclusion criteria, the individuals fulfilling the criteria were then explained about the purpose of the study.

Group A:

- The patient is taken in supine lying, position of therapist at the head end of the plinth. The patient head is rested and therapist Interphalengeal joint flexed to 90* and finger pads in contact with the suboccipital region. The patient is then advised to relax the therapist digs his finger in suboccipital region and hold for 90 seconds and same is repeated for 3 times. 3 such sets are delivered to the patient in one session for 5 days a week for a period of two weeks.
- After that conventional physiotherapy is given which consist of chin tucks, scapular retraction, cervical isometrics all this exercises are performed 10 times with 10 seconds hold.
- For chin tucks ask the patient to pull the chin backwards hold and then release.
- For scapular retractions ask the patient to sit in erect posture with both the shoulders by the side elbow flexed to 90* and forearm supinated then instruct the patient to pull both the shoulders behind with neck in neutral position hold and then relax.
- Cervical isometrics patient is in erect sitting with hands on the thigh and head in neutral position then the therapist place his hand on the forehead of patient for cervical flexor isometrics and ask the patient to push on the hand hold and then relax do the same procedure for cervical extensors, lateral flexors.
- Strengthening Exercise, MFR and Hot packs will be given for 25 min per day for 4 days a week for 2 weeks.

Group B:

Subjects in Control group will be started with Conventional Physiotherapy

- Patient is in erect sitting posture, patient is instructed to do chin tuck then stretch the sub occipital muscles by pulling the head downwards hold for 30 seconds and repeat 3 times.
- Upper Trapezius, Sternocleidomastoid, stretching is done 30 sec hold 3 repetition [13].
- Strengthening exercises for cervical muscles 10 repetition with 5 sec hold.
- For chin tucks ask the patient to pull the chin backwards hold and then release.
- For scapular retractions ask the patient to sit in erect posture with both the shoulders by the side elbow flexed to 90* and forearm supinated then instruct the patient to pull both the shoulders behind with neck in neutral position hold and then relax.
- Cervical isometrics patient is in erect sitting with hands on the thigh and head in neutral position then the therapist place his hand on the forehead of patient for cervical flexor isometrics and ask the patient to push on the hand hold and then relax do the same procedure for cervical extensors, lateral flexors.

2.10 Primary Outcome Measures

1. **Maximum Mouth Opening (MMO) using 15 cm scale**
   The participants were asked to rest for at least 10 min the asked to sit in a chair comfortable with looking straight then asked to open the mouth to the maximum, the linear distance was measured from the upper incisors to the lower incisors [14].
2. **Fonseca Questionnaire:**
   It is used to classify TMD severity as it is highly efficient in obtaining epidemiological data. It is composed of 10 questions, and one has to answer with 'yes', 'no' and 'sometimes' and that only one answer should be marked for each question.

2.11 Secondary Outcome Measure

3. **Numerical Pain Rating Scale (NPRS)**
   It is a 0-10 rating scale in which zero denotes no pain and 10 denotes unbearable pain, the scale is explained to the participants then asked to mark a number on the scale.

2.12 Data Management

Data Collection:

Information about study given at time of recruitment (elaborating the purpose, nature, procedure, benefits and after effects of the intervention) with all baseline tests and assessment will be repeated on 2 more occasions.

3. DISCUSSION

The Protocol will be conducted as to see the effect of Sub occipital Myofacial release technique versus Stretching. In Sub occipital Myofacial release technique the patient is instructed to be in supine line and the finger tips are placed on the sub occipital muscles and ischemic compression and release in given to sub occipital muscles. This is given in 3 sets of 90 seconds this will break the adhesion and then ROM will be assessed.

Stretching exercises is given for the tight muscle and for breaking adhesions followed by strengthening exercises in both the treatment group.

The sub occipital Myofacial release technique is proved to be more efficient than the conventional stretching.

4. CONCLUSION

The Conclusion of the study will be drawn after the data is collected, analysed and afterwards conclusion will be drawn.

CONSENT

Principal Investigators will obtain the written informed consent from the participant on a printed form (local language) with signatures and give the proof of confidentiality.

ETHICAL APPROVAL

The Research Protocol was approved by Institutional Ethical Committee with IEC No. RNPC/IEC/2020-21/0006.

The participant individuals of the study and DMIMSU who will fund it will be able to retrieve findings of study. After completion of study and publication of results data will be stored in the DMIMSU data repository.

CONFIDENTIALITY

The study program will be explained to the participant, the principal investigator will take

subjective information. The consent form will include the confidentiality statement and signatures of the principal investigator, patient and a witness. If required to disclose some information for the study, consent will be taken from the patient with complete assurance of his confidentiality

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Jc T, H S. The dental occlusion as a suspected cause for TMDs: epidemiological and etiological considerations. Journal of Oral Rehabilitation. 2012;39(7). DOI: 10.1111/j.1365-2842.2012.02304.x.
2. Ha van der M, Lb C, Rhh E, Cm V, Mw N der S, Cm S. Effects of physical therapy for temporomandibular disorders on headache pain intensity: A systematic review. Musculoskeletal Science & Practice. 2020; 50. DOI: 10.1016/j.msksp.2020.102277.
3. Sp R. Bruxism, a clinical and electromyographic study. Journal of the American Dental Association (1939). 1961;62. DOI: 10.14219/jada.archive.1961.0002.
4. Tegelberg Å, Wenneberg B, List T. General practice dentist's knowledge of temporomandibuar disorders in children and adolescents. Eur J Dent Educ Off J Assoc Dent Educ Eur. 2007;11:216–21.
5. Rocabado M, Jr BEJ, Blakney MG. Physical Therapy and Dentistry: An Overview. J Craniomandib Pract. 1982; 1(1):46–49.
6. Gadotti IC, Bérzin F, Biasotto-Gonzalez D. Preliminary rapport on head posture and muscle activity in subjects with class I and II. J Oral Rehabil. 2005;32(11):794–799.
7. Kim B-B, Lee J-H, Jeong H-J, Cynn H-S. Effects of sub occipital release with craniocervical flexion exercise on craniocervical alignment and extrinsic cervical muscle activity in subjects with forward head posture. J Electromyogr Kinesiol. 2016;30:31–37.
8. Fernández-de-Las-Peñas C, Von Piekartz H. Clinical Reasoning for the Examination and Physical Therapy Treatment of Temporomandibular Disorders (TMD): A Narrative Literature Review. J Clin Med. 2020;9(11). DOI: 10.3390/jcm9113686.
9. A de W, Jr de L, Mh S, F B. Temporomandibular and cervical spine disorders. Self-reported signs and symptoms. Spine. 1996;21(14). DOI: 10.1097/00007632-199607150-00005.
10. Kogawa EM, Kato MT, Santos CN, Conti PCR. Evaluation of the efficacy of low-level laser therapy (LLLT) and the microelectric neurostimulation (MENS) in the treatment of myogenic temporomandibular disorders: a randomized clinical trial. J Appl Oral Sci Rev FOB. 2005;13(3):280–285.
11. Barnes MF, Mark C, Barnes F. Journal of Bodywork and Movement Therapies (1997). 1996.
12. Muthukrishnan. Prevalence of temporomandibular disorders in Chennai population. Available:https://www.jiaomr.in/article.asp?issn=0972-1363;year=2015;volume=27;issue=4;spage=508;epage=515;aulast=Muthukrishnan. Accessed 15 March 2021.
13. Filho JNDS, Gurgel JL, Porto F. Effects of stretching exercises for posture correction: systematic review. Man Ther Posturology Rehabil J. 2014;1–8.
14. Li X-Y, Jia C, Zhang Z-C. The normal range of maximum mouth opening and its correlation with height or weight in the young adult Chinese population. J Dent Sci. 2017;12(1):56–59.

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