Effect of Temporomandibular Joint Mobilization versus home exercise program on maximal mouth opening in subjects with Oral sub mucosal fibrosis

Romsha Ratan Purohit; Megha Sandeep Sheth; Neeta Jayprakash Vyas

S.B.B College of physiotherapy, Near Ellisbridge, Ahmedabad, Gujarat, India.

ABSTRACT

Introduction: Oral Sub Mucous Fibrosis (OSMF) is a chronic, complex potential potent pre-cancerous condition characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of the sub mucosa (lamina propria and deeper connective tissues). As the disease progresses it leads to disorders of the temporomandibular joint (TMJ) causing various combinations of limitation of movement of the jaw, pain, locking or clicking sounds and difficulty in opening mouth usually treated by maxillofacial surgeries or medical approaches. Objective: To study the effect of TMJ mobilization on maximal mouth opening in subjects with OSMF.

Method: A quasi-experimental study was conducted at college of physiotherapy, Ahmedabad. Twelve participants of OSMF with history of tobacco chewing since last 6 months and willing to participate in the study were included and those who underwent any surgery for OSMF or any injections for pain relief were excluded from the study. The subjects were divided into two groups (A and B). Group A (control group) was given home exercise programme in form of stick exercises. Group B (experimental group) was given TMJ mobilization and stick exercises. Both the groups received treatment for 4 weeks. Maximal mouth opening (MMO) was measured. For MMO, distance from edge of upper incisor teeth to edge of lower incisor teeth was measured using calibrated fibre ruler on first day and after four weeks of intervention. Level of significance was kept at 5%.

Results: Pre intervention MMO in group A was 1.9+0.81 and in group B was 1.7+0.79. Post intervention MMO in group A was 3.13+0.58 and in group B was 4.43+0.71. Within group analysis using Wilcoxon test showed statistically significant difference in both the groups A and B (Z=2.37, p=0.028 and Z=2.21, p=0.018 respectively). Between group analysis using Mann Whitney U test showed statistically significant difference between both group (U=0.2, p=0.01).

Conclusion: Both Temporomandibular joint mobilization and home exercise programme are beneficial but TM joint mobilization has more effect on maximal mouth opening than home exercise program in subjects with Oral sub mucosal fibrosis.

KEY WORDS: OSMF, Temporal joint mobilization, maximal mouth opening

Romsha Purohit

S.B.B College of physiotherapy, Near Ellisbridge, Ahmedabad, Gujarat, India

*Corresponding author
INTRODUCTION

Osteoarthritis (OA) is a degenerative joint disease. Oral Sub Mucous Fibrosis (OSMF) is a chronic, complex potential pre-cancerous condition characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of the sub mucosa (lamina propria and deeper connective tissues). As the disease progresses it leads to disorders of the temporomandibular joint (TMJ) causing various combinations of limitation of movement of the jaw, burning pain, locking or clicking sounds and difficulty in opening mouth which makes eating and speaking difficult. It is strongly associated with areca nut chewing in communities where this habit is common. Population estimates of OSMF indicate that 2.5 million people are affected worldwide. The number has risen to 5 million on Indian subcontinent itself. Percentage of dysplasia in OSMF may range itself from 12 to 15%. The malignant transformation rate of oral sub mucous fibrosis has found to be 4 to 13% worldwide, whereas it is 7.6% in Indian population. Nigam N et al in their study on 1000 individuals having habit of areca nut chewing or gutka for 1 year or more, found the prevalence of OSMF to be 6.3%. Out of which 58.7% individuals had reduced mouth opening with MMO of < 30 mm and 38.09 % had altered taste sensation. Improved oral opening is an important objective of OSMF treatment. Presumed inflammatory basis supports use of steroids, interferon – gamma or anti – inflammatory placental extracts, while modifications of these regimes include dietary supplementation with iron, vit A, vit B as well as injection of degenerative enzymes to facilitate fibrous tissue removal. Surgical and pharmacological treatments have limited success, and are often inaccessible in communities using areca nut where OSF is prevalent. Improved outcomes are reported for surgical treatment when followed by physiotherapy. Some studies have reported use of electrotherapy for treatment of OSMF but there are one to two studies which show use of TMJ mobilization for mouth opening in patient with OSMF. Physiotherapy alone using TMJ mobilization may improve mouth opening without undergoing surgeries which affect the cosmeses of the patient and is cost effective.

Objective: To study the effect of TMJ mobilization on maximal mouth opening in subjects with OSMF.

MATERIALS AND METHODS

A quasi-experimental study was conducted at college of physiotherapy, Ahmadabad. Fourteen subjects with OSMF, with history of tobacco chewing since last 6 months or more and willing to participate in the study were included. Those who underwent any surgery for OSMF or any injections for pain relief were excluded from the study. The subjects were divided into two groups (A and B), each group having seven subjects. Oral informed consent was taken from the patients. Group A (control group) was given home exercise programme in form of stick exercises. Group B (experimental group) was given TMJ mobilization and stick exercises.

For stick exercises the patients were asked to place ice cream sticks in the mouth and sliding it back until it touches the back molars. The numbers of sticks were increased until a stretch was felt. They were asked to hold it in place for 30-60 seconds. They were asked to do stick exercises 3 times a day with 3 repetitions in each session a day and number of sticks were increased as tolerated in each session.

For TMJ mobilization, the patient was instructed to lie supine and a cervical support pillow was placed under the head and cervical spine. The patient’s head was placed in a neutral or slightly flexed posture. Therapist stood at patient’s cranium. The patient was instructed to open the mouth just enough to allow the practitioner to place the thumb pads over the first and second mandibular molars bilaterally. The therapist then flexed the thumbs approximately 5 to 10 degrees forming a slight fulcrum and placed the remaining fingers of each hand under the bottom of the mandible with the fifth digits under the chin. The patient was the instructed to slowly bite down. This biting action initiated distraction of the joints. The therapist immediately applied gradual distractive pressure by pressing down on the molars while pulling up under the chin with the second through fifth digits of each hand. Distractive force was maintained for 30 sec and was given thrice in one session. This was followed by medial and lateral glide of TMJ. Pt’s head was rotated away from the side of mobilization. Using both thumbs lower molars were palpated and lateral translation followed by medial translation were given for 15 to 20 times .mobilization was repeated three times.

Both the groups received treatment for 4 weeks. Maximal mouth opening (MMO) was measured. For MMO, distance from edge of upper incisor teeth to edge of lower incisor teeth was measured using calibrated fibre ruler on first day and after four weeks of intervention. Level of significance was kept at 5%.

RESULTS

Pre intervention MMO in group A was 1.9±0.81cm and in group B was 1.7±0.79 cm. Post intervention MMO in group A was 3.13±0.58cm and in group B was 4.43±0.71cm. Within group analysis using Wilcoxon test showed statistically significant difference in both the groups A(Z=-2.37,p=0.028) and B(Z=-2.21,p=0.018). Between group analysis using Mann Whitney U test showed statistically significant difference between both groups (U=4,p=0.009) as shown in table 2.

DISCUSSION

In the present study at the end of intervention there was a statistically significant difference found within groups and between group analyses for maximal mouth opening (MMO). Thus the study shows that both mouth opening exercise and TMJ mobilization improve MMO but an exercise with mobilization improves MMO more than exercises alone.

The result of present study was supported by the study of Staia S and Zoellner H. Staia S 6 his study...
concluded that TMJ mobilization programme along with conventional physical therapy intervention is more effective in relieving pain and improving maximal mouth opening than conventional physical therapy alone in patients with temporomandibular disorders where as Zoellner H and Cox S\(^2\) showed that physiotherapy improved oral opening, but not oral pain, while no clear improvement was seen in untreated patients as well as patients managed by injection.

The biological basis for OSMF remains unclear, although cytotoxic, apoptotic and proliferative effects have been reported for areca nut derived agents and suggested as contributing to the disease. Cells release cytokines when stimulated with areca nut components, indirectly mediating apoptotic, proliferative and collagen synthetic effects, while immune activity may also play a role, further genetic polymorphins in collagen or immune genes confer increased susceptibility to OSMF\(^8\).

Reichart PA\(^9\) in his study concluded that the primary aim should be to avoid progression of the disease, initially by physiotherapy. Surgical interventions should not be applied at an early stage of the disease because recurrences and further surgical interventions are often necessary.

Some studies showed that even electrical modalities were helpful for mouth opening and pain control in patient with OSMF. Arora P\(^10\) et al, 2013 in their study titled on Ultrasound and jaw opening exercises in cases of oral sub mucous fibrosis concluded that therapeutic ultrasound help makes fibrous tissue more pliable and gradual stretching of oral tissues helping to improve trismus. Ultrasound therapy followed by jaw opening exercises can be an alternate mode of treatment for palliation in OSMF to improve trismus the main morbidity. Kaul V\(^11\) et al in their study concluded that micro diathermy (low current, 20 watts and 2450 cycles) is useful in early and moderately advanced stages of OSMF. Whereas Vijayakumar M\(^12\) et al in 2013 treated 15 cases with ultrasound therapy , intensity from 0.7 – 1.5 w/cm\(^2\) consecutively for 6 days / week for 2 weeks and reported mean improvement in mouth opening was 6.26 mm\(^2\) and the intensity of burning sensation was reduced.

Limitation of the present study was that pain was not evaluated and the study focused only on the mouth opening. Further studies including pain evaluation are recommended.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean ± SD Pre intervention(cm)</th>
<th>Mean ± SD post intervention(cm)</th>
<th>Z Value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>1.9±0.81</td>
<td>3.13±0.58</td>
<td>2.37</td>
<td>0.028</td>
</tr>
<tr>
<td>Group B</td>
<td>1.7±0.79</td>
<td>4.43±0.71</td>
<td>2.21</td>
<td>0.018</td>
</tr>
</tbody>
</table>

**CONCLUSION**

Both Temporo mandibular joint mobilization and home exercise programme are beneficial but Temporo mandibular joint mobilization is more effective in increasing maximal mouth opening than home exercise program in subjects with Oral sub mucosal fibrosis.

**REFERENCES**


