ORIGINAL ARTICLE

Immediate and Prolonged Effects of Temporomandibular Joint Mobilization on Pain, Range of Motion in Hypo Mobile Temporo-Mandibular Joint

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ABSTRACT

Temporo-mandibular disorder (TMD) is a wide term that covers the issues of the temporo-mandibular joint and its related anatomical structures.
Aim: To compare the immediate and prolonged effects of temporo-mandibular joint mobilization with routine physical therapy on pain, range of motion and jaw deviation in hypo mobile temporo-mandibular joint**.**
Study Design: Randomized control trial.
Methodology: Patients (n=70) with both genders were enrolled in present study that was held at University of Lahore for 6 months. Informed consent was taken from all of them. In this study, patients were divide into 2 group equally on each group. Control group received routine physical therapy only while treatment group received temporo-mandibular joint along with received routine Physical therapy. Data analyzed by SPSS 20.0v.
Results: There is clinically significant difference in reduction of pain and improvement in range of motion and jaw deviation of temporomandibular joint in both groups and in between both groups over the time with treatment with either method. But Mobilization of temporomandibular joint showed immediate, early and marked improvement in all variables as compare to Routine Physical Therapy Technique alone.
Conclusion: This study concluded that both physical therapy interventions i.e TMJ joint mobilization and Routine Physical therapy showed significant clinical improvement in reduction of pain and Maximal mouth opening of the Individuals effected by temporomandibular joint disorder. But TMJ Mobilization showed marked and early improvement over time as compare to routine Physical therapy intervention.
Keywords: Functional disability, Physical therapy and Temporo-mandibular joint.

INTRODUCTION

Temporo-mandibular joint (TMJ) disorders also known as temporo-mandibular joint syndrome, comes under a group of disorders affecting the temporomandibular joint muscles of mastication and the surrounding structures.[1,2] The temporo-mandibular joint disorders depicts the symptoms of fascial pain, limited mouth opening due to oral sub mucosal fibrosis and is the common cause of facial pain which comes on the second number after tooth ache which cause facial pain. Mostly adult population is affected with TMJ disorder and occur more commonly in females as compare to males in between 20-40 years of their age[3]. The reasons behind this affected age group of females is still unclear and need further researches to evaluate the affecting factors temporomandibular disorders[4].

Interior insanity depicts conditions where there are primary changes inside the joint. This can be brought about by direct injury, like a hit to the jaw or falling on the jawline, indirect trauma, like a whiplash injury, long haul gripping or granulating, weighty or hard biting or delayed times of mouth opening, like a dental methodology or an overall sedative. Plate dislodging with decrease[4-6].

To improve the TMJ discomfort and ROM different physical therapy interventions have been widely used such as TMJ mobilization technique, soft tissue release, and Cold spray technique, stretching of cervical muscle, KT tape application, proprioceptive neuromuscular facilitation and muscle energy technique etc.[5] Although the treatment effect of different Physical techniques on mouth opening (TMJ ROM) and pain in TMJ has been evinced in these studies, but still it cannot be determined which Physical technique is better in improving the Mouth opening and relieving TMJ discomfort because the results of different studies varies with each other. Most of the work in these studies was done on Jaw pain but not linked to Jaw deviation as well along with difficulty in mouth opening, but there is need to be more research work on difficulty in mouth opening along with jaw deviation and associated TMJ pain[6].

This study would be an addition to evidence with a different population having entirely different lifestyle. If proved effective, this may be a guideline for setting clinical practice guidelines for temporomandibular joints as part of multidisciplinary team approach[7]. This may be helpful as part of service to community in reducing overall impairment and quality of life in patients with temporomandibular joint disorder[8].

The objective of the study was to compare the immediate and prolonged effects of temporo-mandibular joint mobilization with routine physical therapy on pain, range of motion and jaw deviation in hypo mobile temporo-mandibular joint**.**

METHODOLOGY

Patients (n=70) with both genders were enrolled fulfilling the inclusion and exclusion criteria through purposive

sampling in present study that was held at University of Lahore for 6 months. Informed consent was taken from all of them. In this study, patients were divide into 2 group equally on each group. Control group received routine physical therapy session which consists of Hot pack and TENS application along with soft tissue release while treatment group received temporo-mandibular joint along with same routine physical therapy session. Both groups received total of 12 sessions on alternate days for 4 weeks. Measurement of pain and ROM and jaw deviation was taken before and after 1st session, after completion of second week and after completion of 4 weeks. Patient of both genders of age between 20-40 years having pain in TMJ able to comprehend command and willing to participate in the study were included in the study. Patients who have or had Fracture surrounding TMJ, undergone any surgical procedure for TMJ , Dislocation or subluxation of TMJ or with any neurological disorder having malignancy or referred pain of cervical spine were excluded from the study.

Statistical analysis: The data was analyzed using SPSS 20, Statistical Package for Social Sciences. The demographics was presented in frequency/ percentage or mean standard deviation, according to type of variable i.e. categorical or continuous respectively. If the data found as normally distributed than paired samples t-test and/or repeated measure ANOVA for comparisons of means at pre/post intervals of measurements was applied. P-value < 0.05 was considered significant.

RESULTS

Mean age of the patients included in the study is 25.45± 3.98 years in treatment group while mean age of the control group patients is 27.88±4.32 years as shown in table-1. The percentage of male patients in treatment group was 71.4 % while in control group was 57.1%. The percentage of female patients in treatment group is 28.6 % while in control group is 42.9% as shown in table-2.

42.9% patients had symptoms for less than 1 week, 34.3% had duration for more than 1 week while 22.9 % had symptoms for almost 1 month in treatment group as shown by table-3.

There was significant difference in pain in both groups over the time with treatment with either method of treatment as shown in table-5. Similarly, (table-5) there was significant difference in improvement of ROM of TMJ in both groups over the time with treatment with either method of treatment. Significant difference was also find in between the groups with p value <0.001.over the time as well.

In treatment group 42.9% had right side affected TMJ while 40% had left sided affected TMJ and 17.1% patients had bilateral affected as shown in table-4.

Table-1: Age Distribution Of The Patients Having Restricted Mouth Opening (n=70)

Age	Treatment group RPT+MOB	Control group RPT
N	**35**	**35**
Mean (years)	25.45	27.88
SD	3.98	4.32
Minimum	20	20
Maximum	34	34

Table-2: Gender Distribution of Patients in Treatment Groups

	RPT+MOB	RPT	Total
Male	25(71.4%)	20(57.1%)	45
Female	10(28.6%)	15(42.9%)	25
Total	35	35	70

Table-3: Duration of Symptoms in Treatment Groups

	RPT+MOB	RPT	Total
<1 Week	15(42.9%)	15(42.9%)	30
>1 Week	12(34.3%)	9(25.70%)	21
Almost 1 Month	8(22.9%)	11(31.41%)	19
Total	35	35	70

Table-4: Effected Side in Treatment Groups

	RPT+MOB	RPT	Total
Right	*15(42.9%)*	*15(42.9%)*	*30*
Left	*14(40%)*	*10(28.57%)*	*24*
Bilateral	*6(17.1%)*	*10(28.57%)*	*16*
Total	*35*	*35*	*70*

Table-5: Descriptive statistics for Pain & Range of Motion in Treatment Groups

<1 Week	RPT+MOB		RPT		p-value[(b)]
	Mean	SD	Mean	SD	
>1 Week	7.08	.65	6.37	1.33	0.015
Almost 1 Month	4.22	1.19	5.45	1.33	<0.001*
Total	2.22	1.21	4.54	1.57	<0.001*
	<0.001		<0.001		
<1 Week	32.08	8.823	31.57	10.69	*0.826*
>1 Week	35.85	6.91	37.14	7.97	*0.460*
Almost 1 Month	46.57	7.15	40.62	8.26	*0.002**
Total	***<0.001***		***<0.001***		

(a) Wilcoxon Signed Rank Test **(b)** Mann Whitney U test, *****Statistically Significant.

DISCUSSION

Although several mobilizations joint techniques are in practice for the management of TMJ disorders as well as different routine physical therapy maneuvers leading to increased ROM of TMJ along with pain management but still there is still ambiguity regarding the most effective and less time consuming method for management of TMJ disorders.[3] This study was conducted to find out the immediate effects of TMJ mobilization in comparison with Routine physical therapy treatment for improving ROM of joint as well as pain reduction due to affected joint[9]. The findings of current study direct that both TMJ mobilization Technique and Routine Physical therapy treatment improves the ROM, Jaw deviation as well as reduce the discomfort caused by TMJ disorders. TMJ mobilization improve the joint clicking, altered chewing or changes in the patient's ability of mouth opening while routine physical therapy which include TENS, hot pack and soft tissue release improves the biomechanical function of the of the fascia surrounding the joint, contractile component of the muscles relaxes which improves flexibility and increase the elasticity of the non-contractile component surround the TMJ. Thus, our study demonstrated that TMJ pain, patient mouth opening and jaw deviation improves more significantly in TMJ joint mobilization as compare to routine physical therapy alone.[10] The results of current study are very much consistent with the study done by Jay Sata et al to check the Effectiveness of Conventional Treatment in comparison with Temporomandibular Joint Mobilization Temporomandibular Joint Disorders. they concluded that TMJ mobilization along with traditional physical therapy manoeuvres is more effective in decreasing pain and improving ROM of TMJ than traditional physical therapy

interventions alone in individuals with temporomandibular disorders[11].

Another randomized controlled trial done by Aysenur Besler Tuncer et al to check the Effects of manual therapy and home based physical therapy in individuals affected with temporomandibular disorders summarize that the home based traditional physical therapy has a clinically significant results on pain and as well as pain-free maximum mouth The result of this study are consistent with a study done by Joanna et al in 2019 which concluded that myofascial release reduce the muscle strain which is considered as fundamental driver of the sicknesses. Which ultimately cause anatomic constructions inside the vertebral supply route groove[12].

The result of this study are also similar with a study done by Mirjam and coworkers on effects of manual therapy for temporomandibular dysfunction in 2018 in which they focus on soft tissue release. Their study discussed positive effects in terms of Visual analogue sclae, Pressue Pain Threshold and Maximal mouth opening. Although their study described that Myofascial discharge has a solid viability in lessening the indications of intense agony but doesn't show clinically huge changes in mouth opening of the patients Maximal Mouth Opening[13]. Activation/control showed good changes in Maximal Mouth Opening more significantly improving the adequacy of mouth scope of movement in the treatment of the momentary torment manifestation, anyway doesn't support in the long haul. The method for the individual treatment of patients depends on the indications tended to, altogether improving the adequacy of the scope of movement of the mouth in the treatment of joint activation/control, and treatment of agony by myofascial discharge.[14] The results of our study are similar with the study done by Wagner and co-workers on efficacy of musculoskeletal manual approach for the treatment of temporomandibular joint. Their study concluded that musculoskeletal manual methods are significantly improve the mouth opening and pain management as compare to moderate medicines for TMJ disorders[15].

The present study data analysis and results demonstrated that TMJ mobization shows more improvement in mouth opening which is also explained by a randomized control trial done by Breanna and co-workers on push Joint Manipulation to the TMJ in participants with complaint of Temporomandibular disorder[16]. In another study TMJ mobilization was found to be more effective in improving TMJ ROM and pain reduction which was done by Raymond et al on effective management of temporomandibular dysfunction in 2017. In that study they focused on, non-thrust activation and high-speed, low intensity push control methods to the TMJ as well as upper cervical vertebras as compare to soft tissue release on muscles of mastication i.e pterygoid and back, peri-articular connective tissues[17].

CONCLUSION

This study concluded that both physical therapy interventions i.e TMJ joint mobilization and Routine Physical therapy showed significant clinical improvement in reduction of pain and Maximal mouth opening of the Individuals effected by TMJ disorder. But TMJ Mobilization showed marked and early improvement over time as compare to routine Physical therapy intervention.

Author's contribution: NA &AUR: Overall supervision, write up and literature review. AM &SN: Statistics application analysis literature review, help in write up. WL &TL: Literature review help in write-up.

Acknowledgements: I am thankful to Allah and my colleagues who made it possible for me.
Conflict of interest: **None**
Funding: **None**

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