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Comparison of Clinical Parameters between Upper Back Myofascial Pain Syndrome with and Without Painfully Restricted Shoulder Range of Motion: A Cross Sectional Study

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Abstract
Myofascial pain syndrome (MPS) is a musculoskeletal disorder It is associated with myofascial trigger points. Often the MPS involving upper back presents with painfully restricted shoulder range of motion. Which may influence the overall clinical presentation of the patient's sufferings. Different parameters are used to assess patients with myofascial pain syndrome, like pain, activity, global assessment score, pain free range of motion and composite scoring systems like University of California, Los Angeles (UCLA) score and Constant Murley (CM) score. This cross sectional study has been designed to compare the clinical parameters like pain, global score, activity score, University of California, Los Angeles (UCLA) score and Constant Murley (CM) score between patients with Myofascial Pain Syndrome (MPS) involving upper back, with and without painfully restricted shoulder range of motion. Two groups of patients with diagnosed MPS of upper back region, one with painfully restricted shoulder range of motion and another with normal pain free shoulder range of motion were included in the study. Each group included forty patients. The parameters assessed were pain score, patient's global score, physician's global score, activity score, UCLA score and Constant Murley score. Results were analysed and interpreted using appropriate statistical tests. All parameters demonstrated more severity in patients with painful shoulder range of motion.
Keywords: *Myofascial Pain Syndrome, Painful shoulder ROM, Activity score, UCLA score, Constant Murley score.*

Introduction

Myofascial pain syndrome (MPS) is a very common condition observed among people coming to the outpatient department of Physical Medicine and Rehabilitation. People of different economic and social groups are affected by chronic pain of MPS. Though MPS can occur at any skeletal muscle of body subjected to repeated stress or trauma, it is frequently seen that upper back is one of the most commonly involved areas

in MPS. Muscle groups in neck and upper back develops myofascial pain following common etiological events. Repetitive strenuous activity, over loading injury, faulty posture, muscle trauma, biomechanical abnormality are some of the most common predisposing events that lead to development of chronic Myofascial Pain Syndrome. Mostly, people of active age group working in strenuous jobs for long hours both at home or at workplace commonly suffer from this condition.

Myofascial pain syndrome (MPS) is a common musculoskeletal disorder caused by myofascial trigger points. This painfully disabling disorder can affect any of the skeletal muscles in the body. The pathophysiology of MPS is not yet completely understood. It is observed that affected muscles contain a specific trigger point for pain. The trigger point usually contains a palpable taut band or nodular area within the muscle belly. The taut band is considered to be a sustained band of contracted muscle. These trigger points can be classified as active or latent depending on their clinical characteristics. An active trigger point causes spontaneous pain and is tender to palpation with referred radiating pain. Latent trigger points are tender but not spontaneously painful. It is currently hypothesised that trigger points, which is the most common and characteristic feature of MPS, contain areas of sensitised low-threshold nociceptors (free nerve endings) with dysfunctional motor end plates.[1,2,3,4]

Management of patients with MPS includes the elimination of chronic overuse or stress injury of affected muscles. A patient's posture, biomechanics, and joint function should be analysed carefully to identify any underlying factors that may have contributed to the development of myofascial pain. Commonly used treatment of this disease includes different pharmacological and non pharmacological approaches as necessary. Usual treatment approaches in chronic myofascial pain syndrome includes medications, therapeutic exercises, activity limitations, modalities and interventions.

There are a number of important assessment scales and scorings for Myofascial Pain Syndrome to help document the different aspect of pain, discomfort, disability arising out of chronic suffering of MPS. These assessment scales and scores also help determining the pattern of effective and sustained improvement of MPS after necessary treatment. These scoring also helps in choosing right mode of treatment in different conditions of severity in chronic Myofascial Pain Syndrome. Some of the important assessment tools for pain in MPS are VAS scoring for pain, Numeric Rating Scale pain score, global score for overall complain by both patients and physician. These scales give a quantifiable measure of pain and discomfort associated with MPS. Then there is assessment of Range of Motion. Range of Motion in pain free range assessment gives idea about restriction in daily chores. Upper back MPS most frequently affects pain free Range of Motion of neck[5,6] and shoulder[7,8]. This in turn hampers the active movements that are required in daily occupational, household and other recreational activities. Activity score takes account of the ease or difficulty in the basic and instrumental activities of daily living (BADL and IADL) that is hampered by the chronic MPS. There are a few composite scores also which considers pain, activity, ROM, strength, hand positions and patient satisfactions among other criteria. These composite score helps detect the overall status of the patient rather than just individual pain and disabilities. University of California, Los Angeles (UCLA) score and Constant Murley (CM) score are two such scoring systems that are commonly used as outcome assessment tools for MPS.[9]

There are a number of studies involving Myofascial Pain Syndrome both cross sectional and prospective that talks about the pattern of involvement of different scales and scores indicating pain, ROM, discomfort, activity and overall status of patients.[10, 11]

It is also seen that involvement of pain free range of motion of shoulder joint is not wholesome unlike involvement of pain free range of motion

of neck in chronic MPS. Some patients have restriction of shoulder range of motion due to pain while others have completely normal range of motion. This finding indicates that involvement of shoulder joint may have bigger role to play in pain, discomfort, activity and overall status of the patients of MPS and its eventual outcome after treatment. But there is no definitive study in the literatures which has compared between these two types of patients of MPS regarding difference in the pain, discomfort and activity. So it was our humble attempt to address this lacuna.

Aims and Objectives

The cross sectional study is designed to observe the comparison of clinical parameters like pain, global score, activity score, Constant Murley score and UCLA score between two groups of upper back myofascial pain syndrome patient. One group with painfully restricted shoulder range of motion and another group with normal shoulder range of motion. .

Materials & Methods

This cross sectional Study was conducted in the Department of Physical Medicine & Rehabilitation. N.R.S. Medical College & Hospital, Kolkata.

Approval from the Institutional Ethical Committee for the study and Informed consent from all patients included in the study were obtained. Patients of myofascial pain syndrome involving upper back as diagnosed on the basis of diagnostic features of myofascial pain syndrome[12] [Table 1] attending the Out Patient Department of Physical Medicine and Rehabilitation were selected for the study. Patients with hypothyroidism, anaemia, bone disorders, neuromascular conditions, radiculopathy, trauma, inflammatory conditions, cardiac conditions, generalized fatigue, depression, local or systemic infections, diabetes with its neuropathic complications were excluded from the study.

Patients were selected in two groups based on pain free shoulder range of motion. Group 1 consisted of patients with normal full shoulder range of motion and Group 2 consisted of patients with painfully restricted shoulder range of motion. Forty patients were selected in each group.

All patients were assessed utilising outcome assessment tools[9] [Table 2] as per study protocol. Then resultant data from the assessment were analysed with appropriate statistical tools as applicable like Kolmogorov-Smirnov goodness-of-fit test, Mann Whitney test, Student's unpaired t test, Fisher's exact test and Chi-square test.

Results

Forty patients in each group participated in the study. Mean age of the study population in group 1 was 35.97 years with range of age being 22 to 62 years. In group 2, mean age was 42.33 years with age ranging from 18 years to 60 years. Among those forty patients in group 1, thirty seven were female and only three were male. Similarly, in group 2, thirty six were female and four were male patients. In group 1, all thirty seven female were homemaker and those three male patients were manual workers. In group 2, Thirty three out of total thirty six female patients were homemaker and other three were students. Among those four male patients three were in desk job and one was driver. In group 1, only 8 patients had bilateral involvement and rest 32 had unilateral involvement with 16 patients each having involvement on each side. In group 2, 14 patients had bilateral involvement where as other 26 patients had unilateral involvement. Among them, 16 had involvement on the right side and other 10 had left sided involvement. All patients were right handed.

In rank sum comparison between clinical parameters of both groups [Table 3], statistically significant difference was found between two groups in all parameters. Rank sum comparison showed relatively higher Pain and Global score and lower Activity, UCLA and Constant Murley score in group 2 in comparison to group 1.

Table 1

Diagnostic Features of Myofascial Pain Syndrome

A. Features that must be present to diagnose myofascial pain syndrome
1. Taut band within the muscle
2. Exquisite tenderness at a point on the taut band
3. Reproduction of the patient's pain by stimulating the taut band at the trigger point

B. Features helpful, but not required, for diagnosing myofascial pain syndrome
1. Local twitch response (important to elicit by needling when treating by injection or deep dry needling)
2. Referred pain (common and a cause of many myofascial pain syndromes)
3. Weakness
4. Restricted range of motion
5. Autonomic signs, eg, skin warmth or erythema, tearing, piloerection (goose-bumps)

Table 2

Outcome Assessment Tools

1. Pain
2. Patient's Global score
3. Physician's Global score
4. Level of activity score
5. UCLA score
6. Constant-Murley score
7. Patients Global Assessment
8. Physicians Global Assessment

Table 3: Mann-Whitney U test

Table 3	Rank Sum Group 1	Rank Sum Group 2	U	Z	p-level	Valid N Group 1	Valid N Group 2
Pain Score	1282.000	1918.000	482.0000	-2.9221	0.003	40	40
Pt Global Score	1328.000	1872.000	528.0000	-2.4711	0.013	40	40
Phy Global Sco	1370.000	1830.000	570.0000	-2.0592	0.039	40	40
Activity Score	2106.000	1094.000	254.0000	5.1579	0.000	40	40
UCLA Score	2352.500	857.500	7.5000	7.5750	0.000	40	40
CM Score	2276.000	924.000	84.0000	6.8248	0.000	40	40

Discussion

Mean age of group 1 and 2 were in mid thirty and early forty respectively. This finding may indicate to the fact that MPS is more prevalent in this middle age group person. Persons of these age groups i.e. thirties and forties across gender are most productive at work. They usually take workload far more than children, young adults and elderly people. This may be a reason for them to be more prone to develop the chronic ailments of MPS. This data corresponds with demographic profile in other national[17] and international[7] studies in among patients of Myofascial Pain Syndrome.

In a study conducted by Jaiswal et al[13] on the topic of trigger point injection in MPS the mean age group of the study group was 44.8 years and the range was 21-67 years. Bron et al[11] in their study of in treatment of myofascial trigger point observed the mean age of the study group as 42.8 years.

In our study percentage of female patient was more than 90%. Only seven patients were male among both the group together. It clearly shows an increased likelihood in the incidence of MPS in female population. Any possible influence of reducing bone health in middle age group women cannot be ruled out and needs further evaluation. In their study, Lugo et al[14] got 85% female in total study group. Bron et al[11] and Lee et al[15] in their respective study also found out skewed male female ratio with increased female preponderance much like our study.

Most of the female patients having MPS were house wives with moderate to heavy household activity. This signifies that at least in Indian perspective moderate to heavy intensity of house hold chores in absence of any helping hand put enough physical stress on Indian house wives to produce symptomatic MPS. Total seven patients were involved in some kind of prolonged sitting activity for long hours either due to study or job purpose. That also points out another common cause for development of MPS. It is sitting in same posture with faulty ergonomics.

In our study we observed an increased incidence on right side in right handed persons in group 2, while in group 1, the distribution is same between right and left side. Though increased workload on the predominant side may be a cause to development of MPS, we should not jump to a conclusion as two groups in our study made different observation. Also in group 1, only 8 patients, 20% of the total number had involvement on both sides. But, in group 2, number of patients having bilateral involvement is 14, six more than the number in group 1. May be in cases of MPS where shoulder range of motion gets painfully involved, heavy work load on the other shoulder spreads the disease to the opposite side.

In our study group 1, patients with normal shoulder range of motion fared relatively better in different assessment tools. Not only pain and discomfort but also in activity, global score and other overall composite scores like UCLA score and Constant Murley score. But, patients in group 2 with painful shoulder range of motion fared poorly in all the parameters of the study..

This difference between two groups stresses under the fact that shoulder pain and range of motion in patients with MPS is an important indicator of the severity of the condition and may be of the eventual outcome.

Conclusion

In our cross sectional comparative study in patients of MPS between two groups of study population having either normal or painfully restricted range of motion of shoulder joint, we found that patients with normal range of motion of shoulder joint presents with relatively less pain and discomfort and better activity and overall lifestyle. This highlights the fact that shoulder pain and range of motion is an important presentation in MPS whose presence or absence may determine the severity of symptoms and sufferings from the disease.

Sample size of our study was small and there was no control group to compare for the effectiveness of the treatment. Another study with larger sample size and with a control group may help to validate our inferences. A longitudinal study with similar group may help validate our hypothesis that presence of shoulder involvement plays a crucial role in severity and eventual outcome of Myofascial Pain Syndrome.

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