

Original Article

Frequency of Myofascial Trigger Point in upper trapezius muscle and its associating factors among Physical therapist in Karachi, Pakistan: A cross-sectional survey.

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Abstract

Background: Myofascial Pain Syndrome (MPS) is the most familiar painful musculoskeletal condition often caused by Myofascial Trigger Point (MTrP). The study objective was to determine the frequency of MTrP in the upper trapezius muscle and investigate its associating factors among physical therapists.

Methodology: A multi-center cross-sectional study was conducted over 258 male and female physical therapists between 20 to 45 years of age with at least 4 working hours/day. The participants filled a self-structured questionnaire, and bilateral upper trapezius MTrP was identified through the investigator's physical assessment. SPSS version 22.0 was used for statistical analysis. Frequencies and percentages were calculated for all categorical variables. Pearson chi-square test was used to compare the association of MTrP with age group, gender, and workplace. A p-value < 0.05 was considered significant.

Results: Out of 258 samples, 70.5 % (n=182) were found to have MTrP in the upper trapezius muscle. Within our group, the overall frequency of latent MTrP, i.e. 71.4 %, was higher than active MTrP. Poor ergonomics of the workplace, lack of maintaining ideal posture, sleep deprivation, and emotional/psychological stress were the most rated associated factors.

Conclusion: Our study provides preliminary evidence suggesting a high-frequency rate of MTrP in the upper trapezius muscle. This study also suggested a few associated factors which are the cause of developing MTrP. These factors may be useful for developing guidelines for the risk factors and intervention of upper trapezius pain.

Keywords

Myofascial Syndrome, Trigger Point, Poor Ergonomics, Musculoskeletal Disorder, Active Trigger Myofascial Trigger Point.



Introduction

MPS has been identified as a painful musculoskeletal condition often associated with MTrP¹. So far, MTrP is a poorly diagnosed and ineffectively treated source of muscle pain reported in health care settings with point prevalence 10 %-18 % and lifetime prevalence 30 %-50 %^{2,3}. The prevalence of MTrP has been increasing in recent years. MTrP was found more frequent in the trapezius muscle⁴. MTrP is characterized as distinct and local hypersensitive points found in a taut band of a skeletal muscle. On compression, these points are painful, and they produce reproducible pain familiar to patient pain pattern, tenderness, and muscle weakness⁵.

Trigger points can be differentiated into two types on the presence of their clinical features. If the pain produces at rest, tender to palpation with a referred pain pattern similar to the patient's pain complaint, it is an active trigger point⁶. Furthermore, if the localized compression does not produce an instinctive nature pain but may restrict movement or cause muscle weakness, it is called a latent trigger point⁷.

Besides, the formation of MTrP also results from several associating factors, i.e. Macro trauma (contusions, sprain, and strain), microtrauma (chronic repetitive muscle overloading or overuse), mechanical overload (poor posture, poor workplace ergonomics, etc.), degeneration (ageing, bones degeneration with loss of myofascial flexibility), nerve root compression, psychosocial stress, chronic infection, nutritional deficiency, endocrine, and metabolic deficiencies^{3,8}.

Prior literature has proved that the frequency of various musculoskeletal disorders is high among health care professionals⁹. Physiotherapy is a part of the rehabilitation of treating patients manually in offices and clinics. The therapist often applies excessive force in a static uncomfortable position while handling the patient. Furthermore, physiotherapists also may routinely perform activities such as transferring depending on patients, assisting patients in gait, providing

manual resistance, assisting with mat activities, and lifting heavy and cumbersome equipment. Other risk factors include lack of reporting their injury, treating themselves independently, extended clinical hours, and treating many patients in one shift¹⁰. These factors influence the progress of musculoskeletal disorder that is more often myofascial^{11,12}. Musculoskeletal discomfort among physiotherapists disturbs the productivity, performance, treatment quality, and individual's health also. The physiotherapists have to be pain-free, healthy, and comfortable to maintain work efficiency^{13,14}.

However, physiotherapists suffering from musculoskeletal pain often change the way they work, which may adversely affect the quality of treatment¹⁵. However, such surveys have been performed previously to find the prevalence, management, and comparison of MTrP among those who have already neck pain and shoulder pain^{3,16}. To the best of our knowledge, no study determined the frequency of MTrP in particularly upper trapezius muscle and its associating factors among physical therapists in the local community³. Therefore, the primary purpose of this study was to determine the frequency of MTrP in upper trapezius muscle and to investigate its associating factors among physical therapists, which may be useful in developing the guidelines for the risk factors and intervention approach of upper trapezius pain

Methodology

A cross-sectional study was conducted from October to December 2016 in multi-center well-known physiotherapy out-patient departments around Karachi. The study was approved by the institute of physical medicine & Rehabilitation, Dow University of Health Sciences. A total of 258 participants were voluntarily recruited after explaining the study protocol and informed consent. In this study, the participant must be physical therapists of age between 25 to 45 years with at least 4 working hours/day. A self-designed questionnaire was directed amongst those who fulfilled the inclusion criteria. The individual physical examination was performed to identify the

MTrP of bilateral upper trapezius muscle by researchers manually.

Data was entered and analyzed using SPSS version 22.0; frequencies and percentages were calculated to determine the frequency of MTrP, location, types, and common factors. Pearson chi-square test was used to see the association of MTrP with age group, gender, and workplace. A p-value < 0.05 was considered significant. A pie chart was used to show the frequency of MTrP, and a bar

chart was used to show the percentages of MTrP location and its types.

Results

In the present study, 258 participants were enrolled, and out of them, 70.5 % were observed with MTrP (Graph 1), 71.4 % MTrP participant found with the type of Latent MTrP, and 38.5 % found with the Right location, whereas 46.7 % participants found with the bilateral location of MTrP (Graph 2).

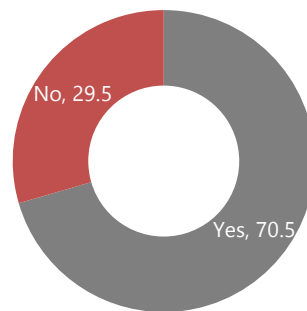
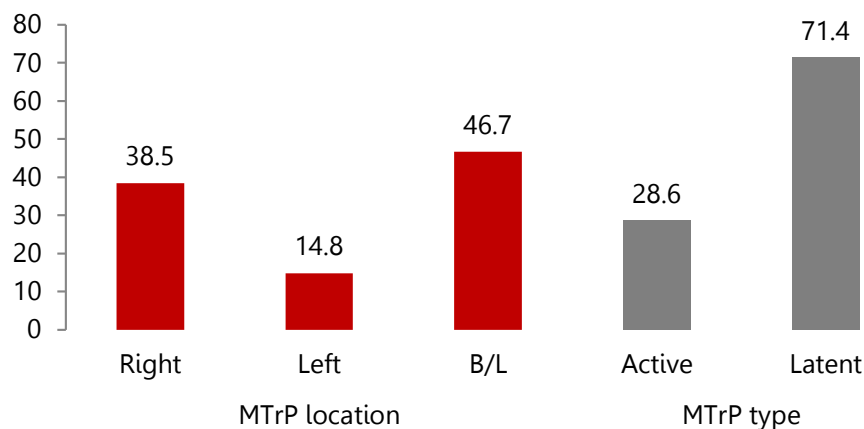


Figure 1: Prevalence of MTrP Cases (n=258)



*B/L: bilateral location

Figure 2: Bar Chart for MTrP Location and Types (n=182)

MTrP was found commonly in 74.02 % of male participants. 90.91 % from 41-45 years old were suffering from MTrP. 73.59 % had Hospital as a workplace. However, there was no significant association of MTrP found with gender, age group, and workplace (Table 1).

Table 1: Association of MTrP with Gender, Age and workplace.

Characteristics		Total (n=258)	MTrP presence				p-value
			No (n=76)		Yes (n=182)		
			n	%	n	%	
Gender	Male	127	33	25.99	94	74.02	0.22
	Female	131	43	32.83	88	67.18	
Age	25-30	150	47	31.34	103	68.67	0.38
	31-35	71	19	26.77	52	73.24	
	36-40	26	9	34.62	17	65.39	
	41-45	11	1	9.1	10	90.91	
Workplace	Hospital	212	56	26.42	156	73.59	0.07
	Home-based services	9	5	55.56	4	44.45	
	Health care center	27	12	44.45	15	55.56	
	Others	10	3	30	7	70	

*p<0.05 was considered significant.

Around 58.2 % participants of MTrP complained for neck pain, 37.4 % participants ranked their pain at moderate level, 50 % participant said dull nature of pain, 65.93 % participants said yes for local pattern of pain, 41.2 % participants reported as last pain was less than one hour, 38.5 % agreed that physiotherapy makes pain better, 56.6 % participants reported worse pain while working, 22.0 % participants marked 'often' for headache due to pain, 44.5 % participants reported 6-8 working hours, 40.7 % participants said they never take rest during work, 34.1 % participants agreed that pain often affect their working efficiency, 58.8 % participants agreed that ergonomics of their workplace was designed according to their physique, only 13.7 % participants maintained their ideal posture during treating patients, 83.5% participants had less than 6 hours sleep, 42.9 % participants going thorough emotional stress, 24.2 % participants said yes for suffering from nutritional deficiency and 7.1 % participants suffered from hormonal and chronic deficiency (Table 2).

Table 2: Common Factors associated with MTrP.

Common Factors of MTrP		N	%
Do you feel any discomfort/pain in the neck or shoulder?	No pain	41	22.5
	Shoulder pain	35	19.2
Grade your pain	Neck pain	106	58.2
	N/A	41	22.5
	Mild	66	36.3
	Moderate	68	37.4
Nature of pain	Severe	7	3.84
	N/A	41	22.5
	Sharp	13	7.1
	Throbbing	6	3.3
	Burning	0	0
	Dull	91	50

	Constant	11	6
	Achy	19	10.4
	Other	1	0.5
What is the pattern of your pain?	N/A	41	22.57
	Local	120	65.93
	Referred	21	11.5
Duration of symptoms (Last)	N/A	41	22.5
	No symptoms	13	7.1
	<1 hour	75	41.2
	>4 hours	20	11
	1-4 hours	14	7.7
	Continuous all-day	19	10.4
What makes the pain better?	N/A	41	22.5
	Rest	59	32.4
	Medication	12	6.6
	Physiotherapy	70	38.5
What makes the pain worse?	N/A	41	22.5
	Rest	3	1.6
	Movement	27	14.8
	Work (physiotherapy)	103	56.6
	Other	8	4.4
Does your pain cause headaches?	N/A	41	22.5
	Never	77	42.3
	Often	40	22
	Mostly	21	11.5
	Always	3	1.6
Duration of working hours/day?	4-6 hours	41	22.5
	6-8 hours	81	44.5
	8-10 hours	39	21.4
	>10 hours	21	11.5
How often you take rest intervals during working hours?	Never	74	40.7
	Every 2 hours	67	36.8
	Every 3 hours	10	5.5
	Every 4 hours	10	5.5
	Other	21	11.5
Does your pain affect your work efficiency?	N/A	41	22.5
	Never	28	15.38
	Often	62	34.1
	Mostly	35	19.2
	Always	16	8.8
Does the ergonomics of your workplace is designed according to your physique?	Yes	75	41.2
	No	107	58.8
Do you maintain an ideal posture while treating patients?	Never	41	22.5
	Often	50	27.5
	Mostly	66	36.26
	Always	25	13.7

How much sleep do you take daily?	<4 hours	17	9.3
	4-6 hours	152	83.5
	>6 hours	13	7.1
Are you going through any emotional/psychological stress?	Yes	78	42.9
	No	104	57.14
Are you suffering from any nutritional deficiency?	Yes	44	24.2
	No	138	75.82
Are you suffering from any hormonal deficiency?	Yes	13	7.1
	No	169	92.85
Any chronic infection?	Yes	13	7.1
	No	169	92.85

Discussion

Our study provides preliminary evidence suggesting a high-frequency rate of MTrP in upper trapezius muscle among physical therapists. According to obtained results, out of 258 samples, 70.5 % of subjects (n=182) were found to have MTrP in upper trapezius muscle, both active and latent MTrPs. The overall frequency of latent MTrP within our group was higher than active MTrP, i.e. 71.4 % (from 182 subjects with trigger point). The comparative latent MTrP data prevalence of 71.4 % was higher than a previous study examining MTrPs in the upper trapezius, in which 220 healthy volunteers were examined for the prevalence of latent MTrP. The result shows that latent MTrPs were prevalent in all triceps surae (13 % to 30 %), left upper trapezius (23 %) and right upper trapezius (20 %) ¹⁶. Whereas, in a few more similar studies, the results were almost the same as our study ⁸. In one of which, 20 subjects with mechanical neck pain and 20 matched healthy control participants were taken to observe the differences in the presence of MTrP in the upper trapezius, sternocleidomastoid, levator scapula, and suboccipital muscles between patients presenting mechanical neck pain and control healthy subjects, the result shows the 70 % prevalence of MTrP in the upper trapezius ⁷. Whereas in another study, 154 subjects were examined for the presence of latent MTrPs in scapular positioning muscles including the upper trapezius, the result shows that out of 154 subjects 89.8 % had at least one latent MTrP in the scapular positioning muscles and

78.8% of them were having latent MTrPs particularly in the upper trapezius ¹⁷.

Almost all our participants with neck pain (58.2 %) presented MTrPs in the upper trapezius. Most of these trigger points were active as subjects were familiar with the location and the quality of the referred pain elicited by pressure applied during physical examinations for MTrP. In our participants, the higher rate of MTrP in the right upper trapezius than left upper trapezius shows that the dominant side is more prone to develop MTrP in a physical therapist. Although the bilateral presence of MTrP is more common in this study, that is 46.7 %.

Total 56.6 % of participants reported worsening of pain while working. One study has resulted as a physiotherapist job requires transferring dependant patients, assisting them in gait training, providing manual resistance in some patients, assisting with MET activities, and lifting heavy and cumbersome equipment that all are responsible for developing MTrP ¹⁸. 38.5 % agreed that treating their pain with physiotherapy techniques makes their pain better. 22.0 % of samples marked 'often' for headache due to pain.

In some previous studies, it has been proposed that tension-type headache may originate, at least to some extent, from referred pain from MTrPs located in the head, neck, and shoulder muscles ¹⁹. It is also concluded in another study that myofascial trigger point can be an important mechanism that causes cervicogenic headaches ²⁰. It is observed from the questionnaire that 44.5 % of samples

reported 6-8 working hours. 36.8 % of samples said they take rest every two hours during working.

The current study has several features making it a strong observational survey, as it is the first of its kind and comprised qualified physiotherapists. The response rate of 100 % is also a notable feature even though it was a multi-center study. However, the study is a valuable sample of the physical therapist in Karachi. This study's results can be used for future studies to explore the broader population's prevalence ratio.

Conclusion

The study concludes that the frequency of MTrP in the upper trapezius muscle is very high among physical therapists. The results of this study also determined some of the most rated associating factors for the physical therapist's poor ergonomics of workplace, sleep deprivation, and emotional/psychological stress. These factors may be useful for developing guidelines for the risk factors and intervention of upper trapezius pain. Thus, specific strategies should be considered to reduce the probability of MTrP.

Conflicts of Interest

None.

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