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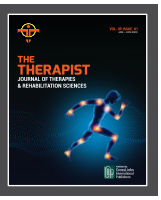

Original Article

Prevalence of Trapezius Trigger Points in Young Healthy Individuals

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ABSTRACT

MTrPs are labelled as hard, discrete, and palpable nodules in a taut band of skeletal muscle. It can be further divided into 2 forms, if it is spontaneously painful (i.e., active trigger points) or painful only on compression (i.e., latent trigger points). **Objectives:** To determine the frequency of active and latent trigger points of trapezius in healthy individuals and to find out its association with gender. **Methods:** A cross sectional survey was conducted from April 2018-August 2018 after getting approval from the ethical committee of Riphah College of Rehabilitation Sciences. The sample size was 323 which were selected by non-probability (convenient sampling) technique. Data were collected through self-structured questionnaire which also included trigger points assessment form. The data were analyzed using SPSS 24. **Results:** The mean age of participants was 23.60±4.6years with 60(19.8%) males and 243(80.2%) females. The trapezius trigger point 2 was found more active on right side (TT2Rt side) in 91(30%) and left side (TT2Lt side) 57(18.8%). While the same was more latent in 75(24.8%) on right side (TT2Rt side) and 86(28.4%) on left side (TT2Rt side) among the participants. There was no significant association between active trigger points and gender (p>0.245), as well as the association between latent trigger point and gender was not significant (p>0.740). **Conclusions:** The frequency of trapezius trigger point is less in healthy individuals whereas the majority of the young individuals have at least one or two active or latent trigger points. There was no significant association of both active and latent trigger points with gender.

INTRODUCTION

Myofascial trigger point (MTrPs) is demarcated as hyperirritable point which is situated inside a tight or inflexible band of skeletal muscle [1, 2]. As the muscle contracts or compression is applied, the spot appears to cause discomfort and becomes more painful with characteristic referred pain is presented [3]. Previous literature suggests incidence of MTrPs is very common in general population, and the prevalence is approximately thirty percent of pain patients referring to primary health care [4]. There are two types of myofascial trigger points present in muscle: active and latent. Active trigger points are concomitant with spontaneous local and referred pain [5]. They may also be associated with other symptoms such as weakness, paresthesia, or temperature changes. On the other hand, latent trigger points only induce local or referred pain when palpated and direct pressure is applied to them [6]. Latent trigger points may become activated by a variety of stimuli, including poor posture, overuse, or muscle imbalance. However, both active and latent trigger points cause loss of range of motion and weakness, which can result in limited function [7]. Furthermore, active MTrPs identified in a particular area of the body are collectively considered as a myofascial pain syndrome (MPS). Myofascial pain syndrome (MPS) is a common skeletal muscle disorder associated with regional muscle pain and tenderness, related to presence of myofascial trigger points [8, 9]. However latent MTrPs, like active MTrPs; following applied pressure might lead to allodynia at

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the trigger point site and hyperalgesia away from the MTrP and linked with peripheral and central sensitization. Both active and latent MTrPs show motor, sensory and autonomic components. Although latent MTrPs are prevalent in healthy persons and those having musculoskeletal pain, could be a source of sensory-motor dysfunction and develop into active MTrPs [9]. The clinical features which are used for the diagnosis of myofascial trigger points are localized pain due to overload or overuse of muscle, palpable band of muscle fibers are present, jump sign is present when pressure is applied on trigger point and at last range of motion is reduced due to muscle pain [10]. The signs and symptoms for trigger points include muscle weakness, muscle tightness muscle stiffness and limited range of motion [11]. Trapezius is a relatively superficial, triangular and flat muscle of upper back that extends from skull's base to lower thoracic spine and insert on the lateral third of clavicle, acromion process and spine of scapula [12]. There are three fibers of trapezius named as upper, middle, and lower trapezius. The role of trapezius muscle is to elevate and depress the scapula and helps in rotation of shoulder girdle [13]. A study by Celik and Kaya on healthy subjects has shown that there is a close relationship between the presence of trigger points and depression levels in healthy people [14]. Manoharlal *et al.*, conducted research on university students in 2016 which showed greater percentage of myofascial trigger points in both left and right upper trapezius. They also concluded that university students were more prone to develop trigger points in upper trapezius, neck extensor and levator scapulae [15]. The study Celik and Kaya indicated that although there is no significant difference between dominant and non-dominant side, muscle strength is lower significantly in subjects who have trigger points in comparison with healthy subjects [14]. Myofascial trigger points are related with a high symptom burden and a detrimental effect on both physical and psychosocial functioning [16]. Young population usually do not find nuisance about good neck postures and maintain static postures during performing activities specially while using electronic devices, so there exist higher chances of developing myofascial trigger points which may decrease their quality of life [17]. Thus, proper assessment and identification of myofascial trigger points in this population along with postural guidance and some exercises can eventually help in decreasing physical stress and improving quality of life [18]. So, the primary aim of current study was designed to explore the frequency of active and latent trigger points of trapezius in healthy individuals and secondary aim was to find out the its association with gender.

METHODS

A cross sectional survey from April 2018- August 2018 was conducted after the approval from ethical review committee of Riphah College of Rehabilitation Sciences. Participants were selected by non-probability convenient sampling technique with a sample size of 323 calculated through Rao-software calculator while assuming student population of 2000 at 95% confidence interval and 5% error of margin. Data were collected from both graduate and undergraduate students from the department of Riphah college of Rehabilitation and allied health sciences. Both genders, with the age of 18 to 35 years were included in the study. Individuals having inflammatory arthritis, cervical spondylolisthesis, and spinal stenosis were excluded from the study. All subjects signed mandatory consent form to ensure their participation in the research project. The participants were assessed according to the assessment form which consists of demographic data of participants including their age, gender, and dominant hand. Active and passive trapezius stretch was performed on both sides, finding normal and painful. Active trapezius stretch was performed by the individuals which was explained to them by the researcher. Passive trapezius stretch was performed by the researcher. Five trapezius trigger points were then assessed on both the right and left side to find out the active, latent and absent points. All the five trapezius trigger points were then palpated by the researcher and noted down on the assessment form. Analysis was carried out on 303 participants as twenty participants refused to participate in the current study. Descriptive statistics were carried, for categorical variables frequency and percentage and for numerical variable Mean±SD was calculated. Chi square test was used to find the association. p value <0.05 considered significant. The data were analyzed using SPSS 24.0.

RESULTS

The mean age of total participants was 23.60±4.6 years. Out of 303, 60 (19.8%) were male and 243(80.2%) were females. The majority were right-handed 291(96.0%), while 12(4.0%) were left-handed. Among the participants, the normal active and passive stretch on right was 209(69%) and 189(62.4%) respectively. The ratio of normal to painful was 6:4 which is shown in Table 1.

Variables	Frequency (%)
Active trapezius right stretch	
Normal	209 (69%)
Painful	94 (31%)
Active trapezius left stretch	
Normal	198 (65.3%)
Painful	105 (34.7%)

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Passive trapezius right stretch	
Normal	189 (62.4%)
Painful	114 (37.6%)
Passive trapezius left stretch	
Normal	162 (53.5%)
Painful	141 (46.5%)

Table 1: Ratio of normal to painful stretch of Left and Right side

The trapezius trigger point 1 of right side (TT1Rt side) was found to be active in 85(28.1%) participants and the trapezius trigger point 1 of left side (TT1Lt side) was found active in 54 (17.8%) participants. The trapezius trigger point 2 of right side (TT2Rt side) was found active in 91(30%) participants, while the trapezius trigger point 2 of left side (TT2Lt side) was found active in 57(18.8%) participants. The trapezius trigger point 3 of right side (TT3Rt side) was found active in 51(16.8%) participants and the trapezius trigger point 3 of left side (TT3Lt side) was found active in 31(10.2%). The trapezius trigger point 4 of right side (TT4Rt side) was found active in 40(13.2%) participants while the trapezius trigger point 4 of left side (TT4Lt side) was found active in 21 (6.9%) participants. The trapezius trigger point 5 of right side (TT5Rt side) was found active in 39(12.9%) participants and the trapezius triggers point 5 of left side (TT5lt side) was found active in 10(3.3%) participants. The details of latent and absent trigger points of both right and left sides are mentioned in Table 2 & 3.

Variables	n (%)	TTI RT SIDE	TT2 RT SIDE	TT3 RT SIDE	TT4 RT SIDE	TT5 RT SIDE
Active	Frequency (%)	85 (28.1%)	91 (30%)	51 (16.8%)	40 (13.2%)	39 (12.9%)
Latent	Frequency (%)	57 (18.8%)	75 (24.8%)	53 (17.5%)	55 (18.2%)	43 (14.2%)
Absent	Frequency (%)	161 (53.1%)	137 (45.2%)	199 (65.7%)	208 (68.6%)	221 (72.9%)

Table 2: Frequency of active, latent and absent trigger points on Right side

Variable	n (%)	TTI RT SIDE	TT2 RT SIDE	TT3 RT SIDE	TT4 RT SIDE	TT5 RT SIDE
Active	Frequency (%)	54 (17.8%)	57 (18.8%)	31 (10.2%)	21 (6.9%)	10 (3.3%)
Latent	Frequency (%)	63 (20.8%)	86 (28.4%)	52 (17.2%)	41 (13.5%)	35 (11.6%)
Absent	Frequency (%)	186 (61.4%)	160 (52.8%)	220 (72.6%)	241 (79.5%)	258 (85.1%)

Table 3: Frequency of active, latent and absent trigger points on Left side

The association between gender and active trigger points using chi square test was not significant (p>0.245), while the association between gender and latent trigger points was found to be p>0.740 (Table 4 & 5).

Active trigger points										p-value
Gender	0	1	2	3	4	5	6	7	10	
Male f (%)	17(5.6%)	11(3.6%)	13(4.3%)	9(3.0%)	5(1.7%)	4(1.3%)	1(0.3%)	0(0.0%)	0(0.0%)	0.245
Female f (%)	84(25.4%)	47(12.9%)	58(19.1%)	28(9.2%)	20(6.6%)	2(0.7%)	2(0.7%)	1(0.3%)	1(0.3%)	

Table 4: Association between gender and Active trigger points

Latent trigger points										p-value
Gender	0	1	2	3	4	5	6	7	10	
Male f (%)	22(6.6%)	12(4.0%)	12(4.0%)	9(3.0%)	5(1.7%)	1(0.3%)	0(0.0%)	1(0.3%)	0(0.0%)	0.740
Female f (%)	77(25.4%)	33(12.9%)	47(15.5%)	31(10.2%)	23(7.6%)	15(5.0%)	8(2.6%)	2(0.7%)	1(0.3%)	

Table 5: Association between gender and latent trigger points

DISCUSSION

This study was conducted to find out the prevalence of myofascial trigger point in healthy individuals. MTrPs are local spots that have increased sensitivity to compression and result in characteristic referred sensations, discomfort, tenderness, muscle dysfunction and sympathetic hyperactivity. The myofascial trigger points are divided in to active and latent on both right and left side. This is supported by some previous studies of Bron *et al.*, and Grieve *et al.*, which were conducted to find out the frequency of active and latent myofascial trigger points in neck, shoulder pain and in non- specific neck and shoulder pain. In these studies, most prevalent muscle recognized of having MTrPs is the trapezius [9, 19]. This study showed that the frequency of overall trapezius trigger point is less in healthy individuals whereas the majority of the adults have at least one or two active and latent trigger points. This is supported by the study of Cimbiz *et al.*, on trigger point evaluation in university students where participants were divided in to two groups with myofascial pain syndrome (MPS) and without myofascial pain syndrome (MPS). They observed that general evaluation score, fatigue, and number of TrPs in control group were lower than MPS groups. Additionally, they found almost four TrPs in MPS group however one or no TrPs were found in control

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group. The highest prevalence of TrPs were observed on the trapezium muscle [20]. The majority of participants had more frequency of absent trigger points on both left and right sides. Lucas *et al.,* in their study on healthy participants to find out prevalence of latent trigger points LTrPs in scapular positioning muscles also concluded that out of one hundred and fifty-four healthy participants 89.8% had minimum one LTrPs in the scapular positioning muscles [21]. This study indicates that trapezius trigger points 1 and 2 are more active and latent on both sides which is in concurrent with the result of the study by Sacramento *et al.,* conducted to find out the presence of latent myofascial trigger points and determination of pressure pain thresholds on children and young adults in which the major number of latent myofascial trigger points were found in trapezius located on upper back affecting 13 adults on dominant side [22]. Another study conducted by Manoharlal *et al.,* in their work on university students showed greater percentage of myofascial trigger points were present in left and right upper trapezius [15]. In the current study there was no significant association found between gender and myofascial trigger points (active and latent) on left and right sides. A study done by Grieve *et al.,* also concluded that there was no noteworthy association of gender and latent myofascial trigger point occurrence in left or right upper trapezius [9].

CONCLUSIONS

It is concluded that the frequency of trapezius trigger point is less in healthy individuals whereas most of the young individuals have at least one or two active or latent trigger points. Moreover, active and latent trigger points have no association with gender.

Authors Contribution

Conceptualization: MK
Methodology: FB
Formal analysis: FB, SKK
Writing-review and editing: HA, FB, SKK. HR, AGS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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