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Quantitative evaluation of trigger points ın Fibromyalgia and Myofascial Syndromes by using Ultrasonography

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General Note
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ABSTRACT

Aim:
MFS and FS are the most common muscle pain syndromes. In this study, we compared the diameters of the trigger points in FS patients with the ones in MFS patients by using US.

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Method:
The study included 23 MFS patients and 24 FS patients who had come to Physical Therapy and Rehabilitation outpatient clinic Marc 2015 and June 2015 with neck pain complaining. During the clinical examinations, trigger points were detected around the neck area in both patient groups. We asked the patients' pain complaints using a VAS for the last week. P<0.05 value is supposed to be significant difference as statistically.

Results:
In our study, the mean age of the patients who were diagnosed with FS was41.87±14.6 years. The mean age of patients in the MFS group was 47.60±16.9 years and the VAS mean value was 4.13±1.9 cm. The mean of the trigger points area value was detected as 10.2±6.7 mm^2. We found a statistically significant difference between the trigger point area values of FS and MFS patients (p=0.000). A statistically significant difference was also found between VAS result values of FS and MFS patients (p=0.001). Spearman correlation analysis was done between VAS value and trigger point area, VAS value was statistically correlated with trigger point area (p= 0,03).

Conclusion:
In our study, we found that the trigger point area is significantly larger in the FS patients compared to MFS patients, using the US evaluation and the one-week VAS values were significantly higher in FS group.

Keywords: myofascial syndrome, fibromyalgiasyndrome, triggerpoint, ultrasonography

Abbreviations: MFS-Myofascial pain syndrome/ FS-fibromyalgia syndrome/US- ultrasonography/ VAS-visual analogous scale

1. INTRODUCTION

Myofascial pain syndrome (MFS) and fibromyalgia syndrome (FS) are the most common muscle pain syndromes. MFS presents a more localized characteristics because it occurs in the trigger points. The presence of the trigger points can be detected during clinical examination. On the other hand, FS is characterized by the occurrence of more widespread anatomic points which are called tender points (1).

Although FS and MFS have a few common clinical characteristics, including the inconveniences caused by both illnesses, there is an insufficient amount of objective data that shows the quantitative characteristics of these two diseases (2). Today, ultrasonographic (US) examination is more common. Ellipsoidal hypoecogenic regions in the muscle can be visualized by using US (Figure 1).

Even though these two diseases are different entities, they can be simultaneously seen in the same person. In FS patients, we usually see trigger points during clinical examination. These do not include other tender points. In this study, we compared the diameters of the trigger points in FS patients with the ones in MFS patients by using US.

2. MATERIALS AND METHODS

The study included 23 MFS patients and 24 FS patients who had come for Physical Therapy and Rehabilitation outpatient clinic between Marc 2015-June 2015 with neck pain complaining. Patients with systemic infection, inflammation and malignancy were excluded. During the clinical examination, trigger points were detected around the neck area in both patient groups. We asked the patients' pain complaints using a visual analogous scale (VAS) for the last week. E saote my lab 70 US measured the diameters of the trigger points at 7.5 Mhz frequency with a linear probe, and the largest diameter was recorded.

The statistical analysis was performed using IBM SPSS for Windows, version 21.0 software (IBM Corporation, Armonk, NY, USA). Descriptive data were presented in mean ± standard deviation (SD) and median scores. The Mann-Whitney U test was used to analyze abnormally distributed data. The Spearman's correlation analysis was used to analyze the level of the correlation between

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the variables. The coherence of variables to normal contribution (normality) was analysed by Kolmogorov-Smirnov test. A *p* value of <0.05 was considered statistically significant.

The ethical approval for the study was obtained from the Inonu University Ethic Committee (2015-58). A written informed consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.

3. RESULTS

In our study, the mean age of the patients who were diagnosed with FS were 41.87±14.6 years. The mean VAS value was detected as 6.29±2.2 cm and the mean trigger point area value was detected as 34.9±9.8 mm^2. The mean age of patients in the MFS group was 47.60±16.9 years and the mean VAS value was 4.13±1.9 cm. The mean trigger point area value was detected as 10.2±6.7 mm^2. The distribution of characteristics of these groups is shown in Table 1.According to the results of this study, there were significant differences between the trigger point area values of FS and MFS groups (p=0,000) (Table 2). According to the results of this study, there were significant differences between the VAS values of FS and MFS groups (p=0,001) (Table 3). Spearman's correlation analysis was done between VAS value and trigger point area, VAS value was statistically correlated with trigger point area (p= 0,03), (Table 4).

Table 1 Characteristic distribution of FS and MFS groups

	FS (N=24) X±SD	**MFS (N=23) X±SD**
Age (year)	41.87±14,6	47.60±16.9
VAS (cm)	6.29±2,2	4.13±1,9
Trigger point area (mm^2)	34.9±9,8	10.2±6,7

Abbreviations: FS: Fibromiyalgia syndrome; MFS: Miyofascial syndrome; VAS: Visual analog scale

Table 2 Mann-Whitney U results of the trigger points of the FS and MFS groups

Group	N	Mean Rank	Mean Total	U	P
FS	24	34,02	816,50	35,500	0,000
MFS	23	13,54	311,50		

Abbreviations: FS: Fibromiyalgia syndrome; MFS: Miyofascial syndrome.

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Table 3 Mann-Whitney U results of the VAS values of the FS and MFS groups

Group	N	Mean Rank	Mean Total	U	P
FS	24	30,42	730,00	122,000	, 0,001
MFS	23	17,30	398,00		

Abbreviations: FS: Fibromiyalgia syndrome; MFS: Miyofascial syndrome; VAS: Visual analog scale

Table 4 Spearman's Correlation analysis

	VAS N=47	Trigger point area N=47
Spearman correlation	0.303	1
P value	0.03	

Abbreviations: VAS: Visual analog scale

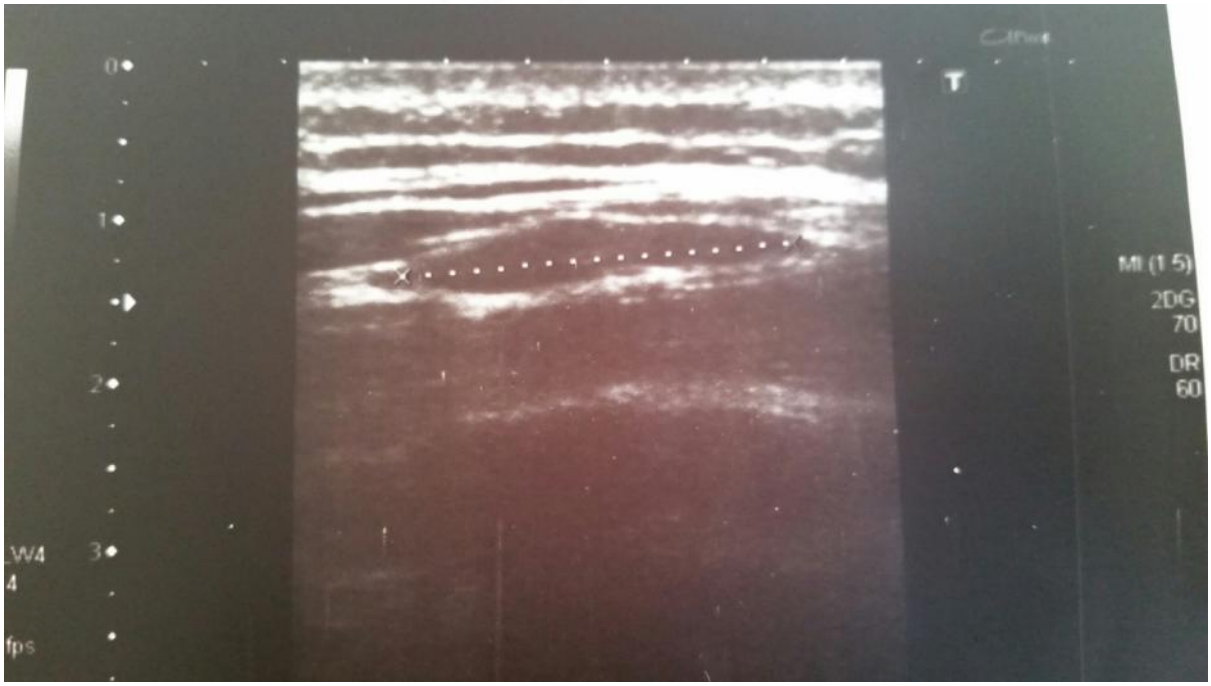

Figure 1 Trigger points seen as ellipsoidal hypoechogenic area in the muscle with ultrasonography.

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4. DISCUSSION

FS and MFS are two different soft tissue syndromes. MFS can be seen either by itself or together with other pain syndromes. FS is a disease resulting from a dysfunction of the neuroendocrine axe and/or limbic system. While there are diffuse, non-specific soft tissue pain and tender points in FS; MFS is characterized with intra-muscular trigger points and taut bands which are reflexive in pattern. The etiology of the tender points is unknown, and localized therapy is ineffective in treating them. However, trigger points are found inside of the taut bands of the skeletal muscles, and they usually respond to localized therapy. It is believed that trigger points develop because of trauma, overuse or elongated muscle spasms (3).

Trigger points are detected more in muscles which are related to body posture, such as the neck, shoulders and pelvic girdle. Additionally, these trigger point scan cause stress headaches, tingling, temporomandibular joint pain, movement limitations or other pain. The resistance which is sensed more than it is and palpation of hypersensitive nodules belongs to muscle fibrils are typical physical evidences in the examination. The palpation of these points causes local fasciculation and reflexive pain in the affected region (4).

Besides attaching an importance to newly developing areas, such as defining pain sensitivity and brain imaging in FS; a lot of new approaches have been developed to quantify physical and biochemical characteristics of the taut bands and trigger points in MFS (2). These trigger points were found to be related to altered vegetative responses and abnormal blood flux against micro-circulation (5,6). In addition, it was shown that pro-inflammatory substances increased in these areas after analysis of the trigger points with micro-dialysis (7). The presence of the trigger points can be detected using clinical criteria, but US, magnetic resonance (MRI) and other micro-analytic techniques can better evaluate these stigmatic lesion characteristics and quantify them (2).

In a study which was performed with infrared tomography by Cojocaru[1] et al. these trigger point areas were observed as high-temperature areas which are surrounded by low temperature regions because of low blood flux rate. Muro-Culebras A[8] et al. morphologically compared these trigger points in FS patients and healthy individuals, and they found that the hypoechoic areas have a larger diameter in the FS group. Our study found this, too. In our study, we found that trigger point area diameters were significantly larger in the FS patients compared to MFS patients, by using US evaluation. In addition, pain complaints of the patients were higher in the FS group, but the diameter of the trigger point was found positively correlated with VAS value. There is not enough data explaining the association between pain complaints and trigger point area diameters. Beyond these, we should also have considered other factors (age, sleep disorder, depresyon, medication etc...) which may effect pain level. The limitation of our study is small sample size and concomitant disorders that may effect pain level are not taken into considered.

It is important to differ these two different medical conditions (4). FS treatment requires a multidisciplinary treatment strategy which includes physiotherapy, oral medication (duloksetin, gabapentin, pregabalin) and a medium exercise program. However, MFS is characterized with reflexive pain, muscle dysfunction and trigger points which respond to manual treatment methods, such as ischemic compression and specific extension techniques (9-12).These trigger points can be effectively treated using techniques such as spray, extension, and manipulation (4).

FS decreases the quality of life and the ability to workof the young and active women population. Quantitative evaluation and treatment of these trigger points can help these patients adapt and live a more normal life. This technique will also be useful for the trigger point evaluation of the MFS patients.US is a technique of choice for both technical and practical reasons: US allows close observation of the needle, it is useful in dynamic studies, and in making a pathological diagnosis. Also, no radiation is used, it is low-cost and portable (13,14).

5. CONCLUSION

Although FS and MFS have a few similar clinical characteristics, such as similar inconveniences, and have similar physical examination results, there is an insufficient amount of objective data that show the quantitative characteristics of these two diseases. In our study, by US evaluation, we found that trigger point areas and one-week VAS values are positively correlated, and significantly larger in the FS patients compared to MFS patients. Quantitative evaluation of the myofascial trigger points by using US are very beneficial in diagnosis, injection therapy, and in follow-up.

SUMMARY OF RESEARCH

Fibromiyalgia syndrome and myofascial syndrome are two different diseases frequently seen in pain clinics. Also we may seen them in one patient concurrently. We only have subjective parameters and scales in evaluation of these diseases. İn recent years by using

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musculoskeletal ultrasonography we able to get quantitative information about rheumatismal diseases. İn the literature researches about ultrasonographic evaluation of trigger points lacks. In our clinical trial we give information about trigger points seen in these two disease group. We only found one trial similar to us. Additionally, we found significance association with visual analog scale and trigger point diameter.

FUTURE ISSUES

Besides attaching an importance to newly developing areas, such as defining pain sensitivity and brain imaging in FS; a lot of new approaches have been developed to quantify physical and biochemical characteristics of the taut bands and trigger points in MFS. Ultrasonographic evaluation of trigger points will be used more commonly for MFS and FS patients in clinic practice.

DISCLOSURE STATEMENT

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