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Comparison of Local Anesthetic Injection and Exercise Therapy Results in Patients with Chronic Cervical Myofascial Pain Syndrome

Kronik Servikal Miyofasyal Ağrı Sendromlu Hastalarda Lokal Anestezik Enjeksiyonu ve Egzersiz Tedavisi Sonuçlarının Karşılaştırılması

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ABSTRACT

Objective: The study was planned to evaluate patients with chronic cervical myofascial pain syndrome treated with lidocane injection and exercise and to compare the efficacy of treatments.

Material and Method: The study included 73 patients (40 females, 33 males) aged between 25 and 65 years, who had been treated with exercise and lidocane injection due to the diagnosis of myofascial pain syndrome in our clinic 6 months ago, and volunteered to participate in the study. The mean age of the participants in the exercise group (n=38) was 44.16±10.63 years. The age of the participants in the lidokayn injection group (n=35) was 42.20±11.63 years. The exercise group was given stretching exercises for the neck and upper back muscles, and strengthening exercises for the neck muscles, 3 sets of 10 times a day. On the other hand, to the Lidokayn injection group participating in the study, 2 ml of 1% lidocaine was applied locally to the trigger points according to the injection technique defined by Travell and Simons. Patients' pain Visual Analogue Scale. pressure pain threshold Algometer, muscle spasm Palpable Muscle Spasm Scoring, cervical normal joint movement (CROM), disability level Neck Disability Scale, depression status Beck Depression Scale, anxiety status Beck Anxiety Inventory and quality of life SF-36 Short Form-36 scales. . Statistical significance level is ($p<0.05$).

Results: The results of lidocaine ejection and exercise are similar in the treatment of MAS. We think that exercise therapy is more feasible in the treatment of MAS because it is non-invasive, easily applicable and more economical.

Keywords: Exercise, Lidocain, Myofascial pain syndromes

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ÖZET

Amaç: Çalışma lidokayn enjeksiyonu ve egzersizle tedavi edilmiş kronik servikal miyofasyal ağrı sendromlu hastaları değerlendirmek ve tedavilerin etkinliğini karşılaştırmak amacıyla planlandı.

Materyal ve Metot: Çalışmaya ortalama 6 ay öncesinde kliniğimizde miyofasyal ağrı sendrom tanısı nedeniyle egzersiz ve lidokayn enjeksiyonu tedavisi almış, çalışmaya katılmaya gönüllü olan, 25 ve 65 yaş aralığında 73 hasta (40 kadın, 33 erkek) dahil edildi. Egzersiz grubundaki (n=38) katılımcıların yaşları ortalaması 44,16±10,63 yıldı. Lidokayn enjeksiyon grubundaki (n=35) katılımcıların yaşları ise 42,20±11,63 yıldır. Egzersiz grubuna daha önce günde 3 set 10'ar kez olmak üzere boyun ve üst sırt kaslarına germe, boyun kaslarına kuvvetlendirme egzersizleri verildi. Çalışmaya katılan Lidokayn enjeksiyonu grubuna ise daha önce tetik nokta üzerine lokal olarak %1'lik 2 ml lidokain, Travell ve Simons'un tanımladığı enjeksiyon tekniğine göre tetik noktalara uygulandı. Hastaların ağrısı Görsel Analog Skalas. basınç ağrı eşiği Algometre, kas spazmı Palpabl Kas Spazmı Skorlaması, servikal normal eklem hareketi (CROM), özür düzeyi Boyun Özür Ölçeği, depresyon durumu Beck Depresyon Ölçeği, kaygı durumu Beck Kaygı Ölçeği ve yaşam kalitesi SF-36 Short Form-36 ölçekleri ile değerlendirilmiştir. İstattistiksel anlamlılık düzeyi ($p<0.05$) tir.

Bulgular: Katılımcıların sonuçları karşılaştırıldığında ağrı algısı, kas spazmı, hareket açıklığı, depresyon, kaygı ve özür durumu genel yaşam kalitesi açısından gruplar arasında istatistiksel olarak anlamlı fark bulunmadı ($p>0,05$).

Sonuç: MAS tedavisinde Lidokayn ejeksiyonu ve egzersiz uygulamasının sonuçları benzerdir. Egzersiz tedavisinin non-invaziv, kolayca uygulanabilir ve daha ekonomik olması nedeniyle MAS tedavisinde daha edilebilir olduğunu düşünüyoruz.

Anahtar Kelimeler: Egzersiz, Lidokayn, Miyofasyal Ağrı Sendromu

1. Introduction

Sedentary life routine and musculoskeletal disorders as a result of rapidly developing technology increase the myofascial pain syndrome (MPS) of the society nowadays [1]. There are different prevalence and incidence values of MPS in the studies and it is more prevalent in female gender between 27.5-50 years of age [2]. Although the etiology of MPS is not clear, the causes of this syndrome are chronic muscle injuries caused by cumulative trauma, acute traumas, muscle fatigue, environmental and psychological stress, and the presence of genetic factors [3]. There is no clear pathology a result of investigations on trigger points characterized by MPS [4]. The symptoms of myofascial pain syndrome originating from a trigger point resulted from a sudden overload or repeated micro-trauma are muscle spasm, limitation of movement, loss of muscle strength, depression, sleep disturbance and autonomic dysfunctions [5].

Trigger points, the most important among the clinical symptoms of MPS, are the 2-5 mm diameter sensitive points which are in the skeletal muscle or multiple muscle at the same time and in which pressure and pain occurs. Taut bands, which are referring to the shortened, hardened and increased tonus of muscle fiber, are the definite objective finding in the examination of MPS [6].

The treatment of painful trigger points may vary; however, the primary aim of treatment is to relieve pain and increase muscle strength at the same time, to regain joint range of motion and to provide suitable posture [7]. Pharmacological treatment such as muscle relaxants, pain relievers and non-steroidal anti-inflammatory drugs as well as interventional applications such as therapeutic local anesthetic, botulinum toxin, steroid injections and dry needling, can be recommended. In addition, noninvasive methods such as hot-cold applications, electrotherapy methods, physical therapy modalities and / or massage and stretching, range of motion are also important in the treatment and treatment is usually administered as a combination of these methods. This study, it is aimed to evaluate the clinical results of patients with chronic cervical MPS who were treated with local anesthetic injection or exercise, and to determine the effectiveness of the treatments and the most appropriate treatment for MPS.

2. Material and Method

Patients diagnosed with MPS according to Simons et al diagnostic criteria were included to this retrospective study. 392 patients aged 25-65 years who were diagnosed with chronic cervical myofascial pain syndrome and received local anesthetic injection and exercise therapy at Yalvac District State Hospital Physical Therapy and Rehabilitation Unit between March 2015 and March 2016 were invited to participate in the study. Since the most common treatment modalities for MPS patients in the clinic were exercise and local anesthetic injections, patients with MPS who were treated with these methods were preferred in the study. In the literature, exercise was frequently preferred as secondary therapy in MPS treatments. In our study, exercise group was preferred to determine the effectiveness of exercise alone in acute conditions. Patients diagnosed with MPS in our clinic may reject injection therapy. In this case, the exercise therapy is given and they are asked to keep an exercise log. In this way, it is seen whether they do their exercises regularly and the process is archived in the diaries of the patients.

The patients diagnosed with MPS were included in the study. The patients included in the treatment were those who were treated with a local anesthetic injection or home program, did not use any corticosteroids, and had not undergone any previous medical operation or treatment. However, he also had Turkish reading and comprehension skills. Patients who did not accept to participate in the study, did not exercise regularly for any reason, did not complete the evaluations, and received additional treatments were determined as exclusion criteria in the study (Figure 1).

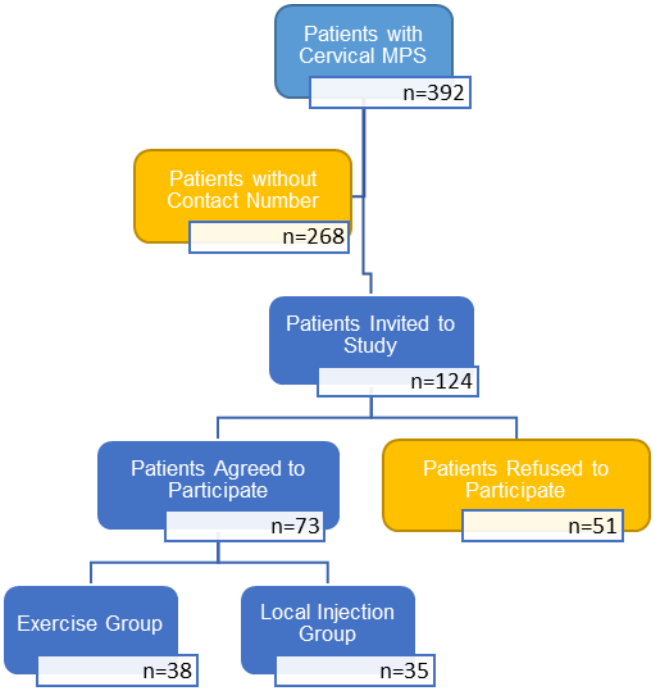

Figure 1: Working flow chart

The demographic data of the participants who signed the consent form after being informed and agreed to participate in the study were recorded with a form.

Visual Analogue Scale (VAS) was used to evaluate the pain severity of the patients. The scale consists of a 10 cm straight line . A score of 0 indicates no pain, and a score of 10 indicates unbearable pain. Patients were asked to mark their pain in activity and resting states. Palpable Muscle Spasm Scoring was used with palpation of the tender point to evaluate the muscle spasm status of the patients[8]. A universal goniometer was used to evaluate the normal range of motion in the neck joint. Flexion, extension, lateral flexion and rotation movements of the neck were measured and the results were recorded. The Neck Disability Scale (DCS) was used for neck disability status. This scale is used to evaluate cervical region disability in patients and consists of 10 items with different parameters and 6 answer options [9]. Beck depression scale (BDS) was used to evaluate the depressive status of the patients. The scale consists of 21 questions that individuals need to answer considering their last week [10]. The Beck anxiety Scale (BAS) was used to evaluate the anxiety status of the patients. The scale consists of 21 questions that include specific symptoms of individuals' anxiety [11]. SF-36 (Short form 36) quality of life questionnaire was applied to evaluate the quality of life of the patients who accepted to participate in the study. The scale was grouped under 8 titles consisting of 36 items. The main titles of the scale are; general health, activities of daily living, physical health, mental health, social activities and pain status [12]. In order to determine muscle sensitivity, pressure pain threshold should be measured and this measurement gives more reliable results by device rather than manual measurement. In addition, a digital algometer was used to determine the pressure pain threshold of the participants.

Patients who were diagnosed with myofascial pain syndrome by applying to the physical therapy and rehabilitation clinic were called by the physiotherapist and invited to the study and formed the exercise group of the study. Neck and upper back muscles as a home exercise program for the patients included in the exercise group; stretching and strengthening exercises for m.trapezius, deep neck flexor muscles and neck extensor muscles were taught. The exercises were shown to the patients by the physiotherapist practically in front of the mirror and it was confirmed whether the patients did the exercises appropriately. The patients were told that they should do the exercises in the home program at least 3 days a week, 3 times with 10 repetitions a day. A brochure for the description of the exercises was also given to the patients. The average follow-up time of patients was $X = 5 \pm 1.2$ months.

The injection group of the study was formed by the patients who received treatment with injection of 2 ml of lidocaine locally on the trigger point from multiple points by experienced physician (same physician administrated the treatments to all patients) according to the method of injection determined by Travell and Simons (minimum 2, maximum 4) [13]. The average follow-up time of the patients was $X = 5 \pm 2.9$ months.

SPSS 16.0 version was used to analyze and compare the evaluation methods. As a result of the Shapiro Wilk test, the t test was applied to the groups with normal distribution in independent group. Comparison of depressive symptoms and neck disability levels of the groups were performed by Independent groups t-test analysis and comparison of the general life quality of the groups were performed by Independent groups t-test analysis. $p \leq 0.05$ were considered statistically significant.

3. Results

Descriptive data of the patients were given in table 1. While the age of participants in the exercise group ($n = 38$) was 44.16 ± 10.63 years, the age of the participants in the injection group ($n = 35$) was 42.20 ± 11.63 years.

In the local anesthetic injection group, 20 patients (57.1%) were female and 15 (42.9%) were male. In the exercise group, 18 (47.7%) were male and 20 (52.6%) were female (Table 1).

Table 1: Demographic characteristics of participants

Variables	Local injection group (n=35) X±SD	Exercise group (n=38) X±SD	t	p*
Age(year)	42.20±11.63	44.16±10.63	0.75	0.45
Size(cm)	164.49±7.95	164.79±9.6	0.14	0.88
Weight(kg)	73.31±12.77	79.26±13.35	1.94	0.05
BMI(kg/m^2)	27.23±5.26	29.29±5.30	1.67	0.09
Male	42.9%	52.6%		
Female	57.1%	47.4%		
Occupation				
Civil Cervant	28.6%	15.8%		
Self Employed	17.1%	28.9%		
Housewife	42.9%	42.1%		
Retired	11.4%	13.2%		
Educational Attainment				
Primary School	11.4%	5.3%		
Middle School	22.9%	34.2%		
High School	34.3%	42.1%		
University	31.4%	18.4%		

Independent groups t-test analysis *p<0.05 BMI: Body Mass Index

When palpable muscle spasm data of the participants in the local anesthetic injection and exercise group were examined, 4 (10.5%) of the exercise group received 1 point, 23 (60.5%) received 2 points and 11 (28.9%) received 3 points. In the local anesthetic injection group, 11 (32.4%) received 1 point, 20 (57.1%) received 2 and 4 (11.4%) received 3 points (Figure 2).

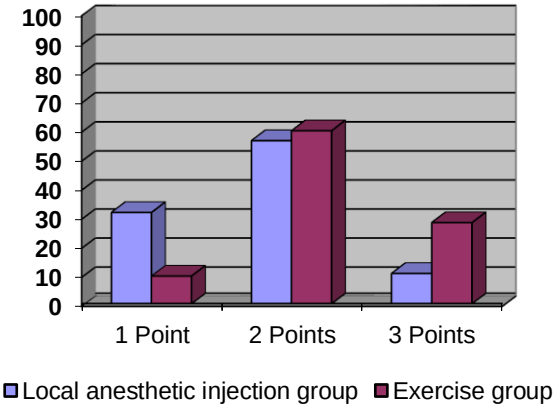

Figure 2: Distribution of palpable muscle spasm values of groups

There was no statistically significant difference in pain, cervical normal joint range of motion, pressure pain threshold, depressive and anxiety symptoms, disability levels and general life quality among the participants in the local anesthetic injection and exercise group (p> 0.05) (Table 2, 3, 4)

Table 2: Comparison of pain perception and active joint range of motion in groups

Variables	Local injection group (n=35) X±SD		Exercise group (n=38) X±SD		t	p*
	Min-max	X±SD	Min-max	X±SD		
Resting Pain (VAS) (cm)	1.2-6.5	3.18±1.23	1-6.1	2.65±1.21	-1.861	0.67
Activity pain (VAS) (cm)	3.9-9.6	6.64±1.33	3.2-9.4	6.60±1.49	-0.138	0.89
Pressure pain threshold	5.3-12.1	8.43±1.89	5.2-11	7.92±1.69	-1.206	0.23
ROM total	275-320	299.97±12.16	272-318	296.84±11.46	-1.131	0.26

p>0.05, Independent Groups t-test
VAS: Visual Analogue Scale
ROM: Range of Motion

Table 3: Comparison of depressive symptoms and neck disability levels of the groups

Variables	Local injection group (n=35) X±SD		Exercise group (n=38) X±SD		t	p*
	Min-max	X±SD	Min-max	X±SD		
BDS	7-40	22.11±8.48	10-45	21.92±8.30	-0.09	0.92
BAS	10-39	20.71±7.60	5-37	20.18±7.81	-0.29	0.77
NDS	7-29	16.85±4.27	9-34	18.47±4.81	2.18	0.65

p*<0.05, Independent Groups t-test
BDS: Beck Depression Scale
BAS: Beck Anxiety Scale
NDS: Neck Disability Scale

Table 4: Comparison of the general life quality of the groups

Variables	Local injection group (n=35) X±SD		Exercise group (n=38) X±SD		t	p*
	Min-max	X±SD	Min-max	X±SD		
General Scale of Life Quality (SF-36)						
Physical function (FF)	40-90	55.14±9.58	15-90	49.34±19.73	-3.68	0.12
Physical role limitation (FRL)	0-100	49.28±28.75	0-100	41.44±30.90	-1.11	0.26
Role emotion (RE)	0-100	41.90±27.22	0-100	36.83±30.79	-0.74	0.46
Energy level (EL)	30-75	48.85±10.85	20-75	48.42±13.20	-0.15	0.87
Mental well-being (MWB)	36-76	57.62±11.21	20-80	53.47±14.83	-1.34	0.18
Social function (SF)	25-100	53.71±17.29	12.5-75	48.02±14.09	-1.54	0.12
Pain (PH)	22.5-77.5	44.28±16.56	22.5-90	48.31±16.81	1.03	0.30
General health (GH)	30-70	48.57±10.88	25-75	47.36±13.98	-0.40	0.68

p*<0.05, Independent Groups t-test
SF-36: Short Form -36

4. Discussion and Conclusion

In the literature about the treatment of MPS, there are studies reporting that exercise should be given as an adjunctive therapy to treatments such as local injections, dry needles and electrotherapy methods. However, this study, we administered only injection treatment for one group and only exercise therapy for the other group with the thought that the exercise therapy should be the primary treatment modality. We found that the clinical results of our patients who received injection and exercise therapy were similar. Thus, we found that exercise alone could be given as the main treatment method for MPS patients rather than as an adjunct to any treatment and there was no difference in approximately 8 months results of the patients.

Musculoskeletal system pain is one of the reasons of major morbidity [14]. MPS is also a major cause of musculoskeletal pain. The main aim of the treatment is to reduce pain and make the effect permanent as soon as possible. Invasive and non-invasive methods related to MPS treatment have been repeatedly compared with different parameters and evaluation methods, and there are some studies which is accepted in general that invasive methods provide early and long-term improvement in treatment, and exercise therapy should be given as a secondary therapy in addition to any treatment for MPS treatment [15]. However, in our study, contrary to these studies; when we compared local anesthetic injection therapy and noninvasive exercise therapy with a minimally invasive method, we found that our patients benefited from both treatment methods and the results of clinical recovery were similar.

Previously, resting and inactivity were recommended in the treatment of chronic pain for years, but over the years it was replaced by physical activity and exercise programs, considering the effectiveness of exercise in reducing pain severity, and the specific benefits of improving physical and mental health. In Cochrane examinations, there are studies stating that pain can be controlled by exercise to determine the effect of exercise programs and physical activity on pain severity, quality of life, function and use of healthcare service as well as the side effects and exercise-related damages in reducing chronic pain in adults, as far as studies stating that exercise programs and physical activity are not effective [16]. However, it was stated in this study that exercise has positive effects on physical function and it was reported that the studies were small and medium scale and larger sample and long term follow up results were required to be taken. In spite of this confusion in the literature about chronic pain treatment, our study supports studies showing the effectiveness of exercise.

When compared to lidocaine injection and physiotherapy modalities, dry needling, ultrasound and stretching exercises in the treatment of MPS in terms of efficacy of therapies, a statistically significant difference couldn't be found, but it was seen to be effective when compared to placebo [17, 18,19] In a recent study, it was reported that both lidocaine injection into trapezium muscles and correction of biomechanical factors had positive effects on pain relief for MPS patients who did not benefit from physiotherapy [20]. In our study, it was shown that local anesthetic injection could be used effectively in MPS treatment, but both treatment modalities in which clinical results were not different with exercise treatment, were found to provide pain relief, increase functionality and quality of life, and reduce disability. The mean follow-up period of our patients was consistent with the literature, and it was determined in the examination that our patients were not receiving any additional treatment during this period (including medical therapy as analgesic and muscle relaxants).

Exercise therapy was added to both treatment program under the control of both physiotherapist and home program as well as each treatment program in comparison with the studies. [21]. Stretching and posture exercises mostly preferred for MPS treatment as well as therapeutic and protective effects have an important role in the treatment due to having the same long-lasting effects of passive stretching which is the only exercise that can be tolerated by the trigger points which was increased in sensitivity [22]. According to Travell and Simons, the patient with MPS who has a trigger point to provide full joint range of motion and continuous relaxation should be given passive stretching exercises in the form of a home program especially by creating awareness. Whereas Hayden reported that it could be more effective with other conservative methods compared to the application of exercise alone in decreasing pain and increasing function [23]. Recent Cochrane review has shown that the use of strengthening and endurance exercises for cervical-scapulothoracic and shoulder may be of moderate benefit in reducing pain and improving function. However, it emphasized that new studies should be performed to determine the optimal dosage by stating that no beneficial effects can be expected only if stretching exercises are

used [24]. Based on the findings of our study, we think that exercise therapy can be used effectively in the treatment of MPS alone.

Both treatment modalities have similar effects. Therefore, we think that exercise therapy is a preferable method since it is both easy and cost-effective to use and it is a non-invasive method. In addition, exercises should be added to each treatment in order to increase the effectiveness of the treatments administered, to be sustainable, to decrease their tension, to regain muscle flexibility and to decrease the frequency of recurrences. The fact that the participants in the study consisted of patients with MPS diagnosis only in the neck and shoulders, being done the reliability of validity of all the scales used in the study and the use of objective evaluation method such as algometric measurement were among the strengths of our study.

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Conflict of Interest: There is no conflict of interest between the authors.

Declaration of Ethical Code

In this study, we undertake that all the rules required to be followed within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with, and that none of the actions stated under the heading "Actions Against Scientific Research and Publication Ethics" are not carried out.

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