

LATERAL EPICONDYLITIS OR FIBROMYALGIA TENDER POINT? DIAGNOSTIC PITFALLS AND THE RISK OF UNNECESSARY ESWT

Lateral Epikondilit mi, Yoksa Fibromiyalji Hassas Noktası mı? Tanısal Yanılgılar ve Gereksiz ESWT Uygulama Riski

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ABSTRACT

Objective: This study aimed to determine the frequency of fibromyalgia syndrome (FMS) in patients with lateral epicondylitis (LE) receiving Extracorporeal Shock Wave Therapy (ESWT).

Material and Methods: All patients who received ESWT in the City Hospital Physical Therapy Unit between January 2017 and December 2023 were retrospectively reviewed, and those diagnosed with LE were included. Demographic data such as age, gender, side of epicondylitis, number of ESWT sessions, invoice amount, cost, and presence of FMS were recorded.

Results: A total of 2810 patients were included; 1851 had unilateral and 959 bilateral LE. Among unilateral cases, 71.3% were women, while in bilateral cases, 79.4% were women, showing a significant gender difference ($p < 0.001$). The mean ages of unilateral (46.30 ± 12.73) and bilateral (46.54 ± 11.83) groups did not differ significantly ($p = 0.626$). FMS was found in 0.6% of unilateral and 19.2% of bilateral cases, indicating a significant difference ($p < 0.001$). Both LE and FMS were more common in women and middle-aged patients.

Conclusion: This study is the first to investigate FMS frequency in LE. Bilateral LE patients showed a higher FMS rate compared to the general population. The lateral epicondyle, a common pain site in fibromyalgia criteria, may cause diagnostic confusion, leading to misdiagnosis of LE and unnecessary ESWT. Clinicians should consider FMS, particularly in bilateral cases, and prioritize multidisciplinary fibromyalgia management, including medication, exercise, and lifestyle modification to prevent unnecessary and costly ESWT treatments.

Keywords: Lateral Epicondylitis; Extracorporeal Shock Wave Therapy; Fibromyalgia Syndrome; Prevalence

ÖZET

Amaç: Bu çalışmanın amacı, Ekstrakorporeal Şok Dalga Tedavisi (ESWT) alan lateral epikondilitli hastalarda fibromiyalji sendromu sıklığını belirlemektir.

Gereç ve Yöntemler: Ocak 2017–Aralık 2023 tarihleri arasında Şehir Hastanesi Fizik Tedavi Ünitesi'nde ESWT tedavisi gören hastalar geriye dönük olarak tarandı ve lateral epikondilit tanısı alanlar çalışmaya dahil edildi. Hastaların yaş, cinsiyet, epikondilit tarafı, ESWT seans sayısı, fatura tutarı, maliyet ve fibromiyalji sendromu tanısı kayıt altına alındı.

Bulgular: Toplam 2810 hasta incelendi; 1851'i tek taraflı, 959'u bilateral epikondilit tanısı aldı. Tek taraflı olguların %71,3'ü, bilateral olguların %79,4'ü kadındı ve cinsiyet açısından anlamlı fark bulundu ($p = 0,000$). Yaş ortalamaları benzerdi ($p = 0,626$). Fibromiyalji sendromu tek taraflı olgularda %0,6, bilateral olgularda %19,2 oranında saptandı ve fark anlamlıydı ($p = 0,000$). Her iki hastalığın da kadınlarda ve orta yaşta daha sık olduğu görüldü.

Sonuç: Bu çalışma, lateral epikondilitte fibromiyalji sendromu sıklığını inceleyen ilk çalışmadır. Bilateral olgularda fibromiyalji sıklığı normal popülasyona göre artış göstermiştir. Lateral epikondilit, fibromiyalji tanı kriterlerindeki yaygın ağrı bölgelerinden biridir ve bu durum tanısal karışıklığa yol açabilir. Bazı hastalara fibromiyalji yerine yanlışlıkla lateral epikondilit tanısı konularak gereksiz ESWT uygulanmış olabilir. Klinik değerlendirmede, özellikle bilateral olgularda fibromiyaljinin eşlik edebileceği akılda tutulmalı ve uygun multidisipliner tedavi yaklaşımları öncelikli olarak düşünülmelidir.

Anahtar Kelimeler: Lateral Epikondilit; Ekstrakorporeal Şok Dalga Tedavisi; Fibromiyalji Sendromu; Prevalans

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INTRODUCTION

Lateral epicondylitis (LE) is one of the most common causes of non-traumatic elbow pain, which develops as a result of repetitive stresses due to overuse of the forearm muscles, and is also called tennis elbow (1, 2). It is characterized by pain in the lateral epicondyle of the humerus to which the extensor muscles of the wrist attach, and on the extensor surface of the forearm. This condition occurs as a result of excessive and misuse of the extremity, repetitive wrist movements and microtraumas due to gripping activities (3). It has a prevalence ranging from 1-3% in the general population, and the age of onset is generally between 35-55 years. It is seen in women and more often on the dominant hand side. Typical symptom duration is between 6 and 24 months (4).

Although conservative and surgical treatment methods can be used in the treatment, conservative treatment methods provide improvement in 95% of the cases (5). The main aim of treatment is to relieve pain, regain lost functions and return to normal occupational and daily life activities. Rest, patient education, behavior modification, non-steroidal anti-inflammatory drugs (NSAID), splint and orthosis use, ice application, electrotherapy, massage, manual therapy, stretching and strengthening exercises, Extracorporeal Shock Wave Therapy (ESWT), dry needling, taping, balneotherapy, cryotherapy, steroid injections, platelet-rich plasma (PRP), hyaluronic acid injections and prolotherapy applications are available conservative treatment alternatives include (5).

ESWT is a treatment method for applying high-intensity pressure waves created outside the body to the desired area of the body through an ellipsoid-shaped head. ESWT has been applied in the field of medicine since the 1980s. It is thought that it stimulates angiogenesis by increasing the diffusion of cytokinin from the vessels, and provides an effect by creating neovascularization in the tendon-bone region. It is mentioned that it is an effective treatment for the treatment of patients with resistant LE in many studies (6, 7).

Fibromyalgia syndrome (FMS) is a disease in which widespread pain in soft tissues is the leading role, accompanied by other somatic symptoms, especially fatigue, sleep disorders and tenderness in soft tissues (8). Although it is more common in

women, its prevalence in Turkey was found to be 3.9-5.6% (9, 10). The etiology and pathogenesis of the disease have not been clearly explained yet, and it is thought to be multifactorial. FMS causes physical and emotional deterioration in the patient's quality of life and difficulty in performing activities of daily living. Along with pain, which is the main symptom of the disease, other symptoms also contribute to this condition. Diagnostic criteria for the diagnosis of the disease have changed and developed over the years, but a gold standard diagnostic method has not been established yet. Until the pathophysiology is better elucidated and biomarkers are identified, diagnosis will remain dependent on patient reporting and clinical assessment (11).

The lateral epicondyle region, which is one of the 18 tender points in the ACR (American Rheumatology Society) 1990 FMS Classification Criteria and one of the common pain areas in the ACR 2016 Diagnostic Criteria, may cause diagnostic confusion (12, 13). The diagnostic difficulties of FMS and its potential to be confused with other musculoskeletal diseases were evaluated in a review published in 2014; it was reported that FMS is characterized by widespread pain and tenderness points and can be confused with other localized pain syndromes, which can lead to misdiagnosis and unnecessary treatments (14). Similarly, it was emphasized that the widespread pain and tender points of FMS can be confused with other localized pain syndromes like LE in 2016 (12). It has been reported that myofascial pain syndrome and FMS may cause LE-like symptoms, which increases the risk of misdiagnosis. It has been reported that the risk of failure increases when underlying systemic pain syndromes such as FMS are ignored in evaluating the effectiveness of methods such as ESWT in the treatment of LE (15). Similarly, it has been suggested that the effectiveness of ESWT in LE is limited and that lack of response in some patients may be due to underlying systemic factors such as FMS (16). As a result, patients may have been mistakenly diagnosed with LE and unnecessarily received ESWT treatment, although they actually had FMS. There is no data in the literature on the frequency of FMS in LE. Both FMS and LE are common in middle-aged and women, and therefore they can be seen frequently together. The aim

of this study was to determine the frequency of FMS in patients with LE receiving ESWT treatment and to raise awareness that FMS may cause patients to receive ESWT treatment unnecessarily and cause a very large cost unnecessarily. In addition, this study aimed to contribute to a better understanding of the relationship between lateral epicondylitis and fibromyalgia and to provide a basis for future prospective research.

MATERIAL AND METHODS

Study Design: This retrospective study was undertaken between January 2017 and December 2023. Since the City Hospital where the study was conducted was opened in January 2017, the scanning of the study data started from this date; since the ethical approval was received in January 2024, the data up to December 2023 were scanned. This study was conducted with the approval of the City Hospital No. 2 Clinical Research Ethics Committee (E.Kurul-E2-24-6084) and with the Chief Physician's retrospective study permit letter, in accordance with the Declaration of Helsinki.

Patients: Since the study was retrospective, no sample calculation was made; all patients diagnosed with LE and treated with ESWT in the specified date range were screened. Patients who were examined in the City Hospital Physical Therapy Unit with the diagnosis of LE, who were treated with ESWT, whose contact information could be accessed in the hospital information system, and who regularly attended their sessions were included in the study. Patients whose contact information could not be reached in the hospital data system, who did not attend their sessions regularly, and whose file data were missing were excluded from the study.

Demographic information of patients such as age and gender, epicondylitis side, number of ESWT sessions, invoice amount, cost and whether have diagnosis of FMS were recorded. Patients were classified as those with unilateral LE (group 1); those with unilateral LE plus FMS syndrome (group 2); those with bilateral LE (group 3); and those with bilateral LE plus FMS syndrome (group 4). After obtaining ethical approval and the Chief Physician's retrospective study permit letter, patients' electronic patient card information was accessed; patients who were diagnosed with FMS at repeated intervals by Physical Medicine and

Rehabilitation Polyclinics and who had a drug report issued for FMS treatment were accepted as FMS. Since it was a retrospective study, no consent was obtained from the patients and no contact was made with the patients, but permission was obtained from the chief physician to access the retrospective data. Only patients who received ESWT treatment were included in the study, and it was not evaluated whether the patients received any other physiotherapy or medical treatment. In patients diagnosed with fibromyalgia, the American College of Rheumatology criteria were used, and the diagnosis was confirmed during repeated outpatient follow-up visits. Specifically, the 2016 revised ACR diagnostic criteria were applied for the diagnosis of fibromyalgia.

ESWT: Radial shock wave therapy was applied to the patients with the EMS Swiss DolorClast Master ESWT Device in our study. The treatment was applied to the lateral epicondyle and the painful points around it, at 10 Hz, 1.6 - 1.8 bar, 2000 beats, 2 sessions a week, total of 5 sessions. Ultrasound gel was used to ensure conductivity during the treatment. The application was performed with the patient in a sitting position, shoulder abduction 45, elbow flexed, while supporting the forearm. The use of the same standardized protocol for all patients minimized potential methodological differences in treatment application

Statistical Analysis

All analyses were carried out with SPSS 26.0 (IBM, USA). The findings of the study are expressed as frequency and percentages. Parametric tests were used for normally distributed continuous variables, while non-parametric tests (Mann-Whitney U) were applied for variables that did not meet normality assumptions. Normality analysis was carried out using Kolmogorov-Smirnov test. The variables that did not normally distribute are presented as the median and interquartile range (IQR) with 25-75th percentiles. Descriptive statistics mean and standard deviation (mean±SD) were used for normally distributed variables, mean and minimum-maximum values were used for non-normally distributed variables. Numeric dependent variables with abnormal distribution were compared with the Mann-Whitney U test. Categorical variables were compared using the Chi-Square test.

P< 0.05 was accepted for statistical significance.

RESULTS

A total of 3170 patients were treated with ESWT due to LE between January 2017 and December 2023; 200 of these patients were excluded from the study because they did not complete the ESWT treatment sessions and this would add to the cost expense, and 160 patients were excluded because their past clinical information and electronic patient card could not be accessed. A total of 2810 patients who received ESWT treatment with the diagnosis of LE were included in the study.

While 1851 patients were diagnosed with unilateral epicondylitis, 959 patients were treated with the diagnosis of bilateral epicondylitis. While 1319 (71.3%) of the patients with unilateral epicondylitis were women, 761 (79.4%) of the patients with bilateral epicondylitis were women and there was a significant gender difference between groups, and female gender was more common in bilateral epicondylitis (p: 0.000). The mean age of patients with unilateral epicondylitis was 46.30±12.73 years, while the mean age of patients

with bilateral epicondylitis was 46.54±11.83 years, and there was no significant difference between the groups in terms of mean age (p:0.626). (Table 1).

While 11(0.6) of unilateral epicondylitis patients had FMS, 184(19.2%) of bilateral epicondylitis patients had FMS and there was a significant difference between the groups in terms of FMS frequency, and FMS was more common in bilateral epicondylitis (p: 0.000) (Table 2).

DISCUSSION

We found FMS more common in diagnosed of bilateral epicondylitis patients treated with ESWT compared to unilateral epicondylitis patients and to the general population in our study. We found both LE and FMS more common in women and middle age. This result suggests that fibromyalgia assessment should be considered an integral part of the clinical evaluation, particularly in cases of bilateral epicondylitis.

LE and FMS are two common diseases in women. While no significant difference was found in terms of prevalence in some studies, it was shown that LE is more common in women in some studies (10, 17). 74.02% of the patients participating in our study were

Table 1. Demographic features of unilateral /bilateral lateral epicondylitis alone (group 1, 3) and lateral epicondylitis plus fibromyalgia syndrome patients (group 2, 4)

	Unilateral		Bilateral		p
	LE alone patients Group 1	LE plus FMS patients Group 2	LE alone patients Group 3	LE plus FMS patients Group 4	
Frequency (%)	1840(99.4)	11(0.6)	775(80.8)	184(19.2)	
Gender N (%) Female/N Male (%)	1319(71.3) /532(28.7)		761 (79.4) / 198(20.6)		p<0,0001
Age(mean±SD)	46.30±12.73		46.54±11.83		0.626
Invoice amount (TL) (mean±SD)	83.71±59.756		167.81±67.885		p<0,0001
Cost (TL) (mean±SD)	81.26±41.537		164.45±53.739		p<0,0001
Number of ESWT therapy sessions (mean±SD)	2.97±1.375		3.35±1.109		p<0,0001

LE: Lateral Epicondylitis, FMS: Fibromyalgia Syndrome, SD: Standard Deviation, TL: Turkish Lira, ESWT: Extracorporeal Shock Wave Therapy

Table 2. Distribution of patients according to the presence of fibromyalgia syndrome and lateral epicondylitis

	FMS	
	Alone N (%)	Plus N (%)
Unilateral LE	99.4	0.6
Bilateral LE	80.8	19.2
P value	p<0,0001	

LE: lateral epicondylitis, FMS: Fibromyalgia Syndrome, N: number

women consistent with the literature. After the age of 30, the incidence of LE increases with the decrease in water content and loss of flexibility in the joint capsule, tendon and soft tissues, and the general age of onset is between 35-55 years (4, 18). The age of the patients was between 21 and 65, and the mean age was 46.40 consistent with the literature.

The prevalence in the general population has been reported as 1-3% for LE and 2-3% for FMS (1, 9). While the prevalence of LE in the general population is 1-3%, the prevalence of bilateral epicondylitis is not exactly known, but it constitutes 5-10% of all LE cases. Its prevalence in the general population is between 0.1% and 0.3% and is usually associated with systemic diseases (e.g. diabetes, rheumatoid arthritis, FMS) or heavy occupational loads (19, 20). Contrary to literature, we found that 65.8% of 2810 LE patients who received ESWT treatment had unilateral epicondylitis, 34.2% had bilateral epicondylitis. This difference may be due to the fact that some of the patients diagnosed with bilateral epicondylitis did not have LE and had FMS tender points that mimicked LE.

There is no data in the literature on the frequency of FMS in LE. The one of the basic pathological mechanisms of the disease is enthesitis, inflammation at the points where muscles and tendons attach to bones in ankylosing spondylitis (AS). LE is also considered an enthesopathy, and this common pathological mechanism may contribute to the development of chronic pain in both diseases. FMS is characterized by widespread pain and central sensitization. Chronic pain caused by enthesitis may lead to the development of central sensitization, creating a predisposition to FMS in AS. Similarly, central sensitization may develop in cases where LE becomes chronic, and this may increase the frequency of FMS. Therefore, AS studies examining the relationship between chronic pain caused by enthesitis and FMS provide a good comparison point for investigating the frequency of FMS in patients with LE. Sayın et al., looked at the frequency of FMS in 127 patients with axial spondyloarthropathy and 73 age- and sex-matched control patients and found the frequency of FMS 43 (33.9%) in the axial spondyloarthropathy group and 22 (30.1%) in the control group ($p : 0.58$) (21). Macfarlane et al., investigated the association of FMS in patients

with axial spondyloarthritis from the British Society of Rheumatology Biology Registry in the Ankylosing Spondylitis cohort and found FMS in 311 (20.7%) of 1504 patients who met the 2011 research criteria (22). Both LE and temporomandibular disorders (TMD) are chronic musculoskeletal pain syndromes that begin localized but can eventually cause widespread pain and functional limitations. Studies examining the frequency of FMS in TMD patients provide a meaningful scientific basis for comparison when investigating the frequency of FMS in LE patients, as they reveal common mechanisms such as chronic musculoskeletal pain, myofascial dysfunction, and central sensitization. Erbaşar et al., found the frequency of FMS 60% in patients with temporomandibular joint dysfunction in 2019 (23). They may have found the frequency of FMS to be high because the number of patients was only 25. The prevalence of temporomandibular disorders and FMS was examined in the meta-analysis published in 2023; almost one third of individuals with temporomandibular disorders (32.7%, 4.5%-71.0%) were reported to have FMS (24). Similarly to Macfarlane study, since our patient numbers were similar, we found the frequency of FMS was 19.2% in 959 patients with bilateral epicondylitis who received ESWT treatment in our study. The large sample size in our study and the focus on patients receiving only ESWT can be regarded as methodological strengths compared to similar studies in the literature.

Özçakır found the frequency of FMS to be 25.45% in the presence of clinical carpal tunnel syndrome, and 26% in the presence of carpal tunnel syndrome both clinically and electrophysiologically in her study which she investigated the frequency of FMS in patients presenting with carpal tunnel syndrome symptoms in 2020 (25). The reason for the low frequency of FMS in the study with chronic Achilles tendinopathy, unlike our study, may be the low average age and the low ratio of female. Unlike our study, the reason for the low frequency of FMS in shoulder diseases is the low female gender, shorter average complaint duration, and the fact that FMS tender points are on the trapezius above the shoulders instead of the shoulder head, so it may cause more back pain than shoulder complaints. Similarly to Özçakır's study, we found the frequency of FMS 19.2% in 959 patients with bilateral epicondylitis

who received ESWT treatment in our study. Carpal tunnel syndrome, like bilateral epicondylitis, can mimic FMS, both because it is more common in middle age and women, and because numbness, pain, and weakness mimic FMS symptoms. In our study, we think that the frequency value is more valid because the number of patients is high.

Although there is no data in the literature on the frequency of FMS in LE; Genç et al., investigated the effects of FMS on pain severity, disability and treatment outcomes in patients with chronic LE in 2012. Seventy-eight patients with chronic unilateral epicondylitis and 30 healthy people were included in their study. They found that LE patients with FMS had less improvement and less pain relief at the controls 2 weeks and 3 months after corticosteroid injection compared to those without (26).

The number of sessions and costs of ESWT applications in the treatment of LE vary in the literature. It is seen that ESWT is applied with different protocols in various studies. Bayram and his colleagues applied ESWT for a total of 3 sessions, once a week (27). A total of 4 sessions of ESWT were applied, 2 sessions per week in another study, (28). A total of 3 sessions of ESWT were applied once a week in a study comparing deep transverse friction massage with ESWT (29). These differences show that treatment protocols can vary according to the clinical situation and the preference of the practitioner. We found that the average ESWT session was 3.35 in patients with bilateral epicondylitis, while it was 2.97 in unilateral epicondylitis in our study. This difference may be due to the fact that some patients with bilateral epicondylitis actually had pain related to FMS rather than LE, and received more sessions because their pain did not go away. The cost of ESWT varies depending on the number of applications and the devices used. For example, in one study, the cost of ESWT was stated as 124 TL (29). However, it should not be forgotten that this cost is specific to the period and region in which the study was conducted. In general, it is stated that ESWT is a less invasive and more cost-effective option than surgical interventions (30). In conclusion, the number of sessions and cost of ESWT may vary depending on the applied protocol, clinical situation and regional factors. We found that the average ESWT bill was 167.81 TL in patients with

bilateral epicondylitis, while it was 83.71 TL in unilateral epicondylitis in our study. This difference was caused by patients with bilateral epicondylitis receiving more ESWT sessions, and therefore there was a greater cost loss. Nevertheless, the present findings indicate that fibromyalgia may be an important explanatory factor for treatment failures in lateral epicondylitis.

The limitations of the study include the lack of a healthy control group, the retrospective nature of the study, the lack of specification of the duration of FMS, lack of knowledge of other comorbidities, medications used, smoking and alcohol use, etc., lack of knowledge of the severity of pain, and the inability to evaluate the effect of FMS diagnosis on the effectiveness of ESWT treatment in patients with LE. Future prospective and multicenter studies are required to confirm these findings and to explore causal relationships.

CONCLUSION

Our study is the first to investigate the FMS in LE. While the prevalence of LE in the general population is 1-3%, the prevalence of bilateral epicondylitis is not exactly known, but it constitutes 5-10% of all LE cases, its prevalence in the general population is between 0.1% and 0.3% and is usually associated with systemic diseases (e.g. diabetes, rheumatoid arthritis, FMS or heavy occupational loads (19, 20). We found that 65.8% of 2810 LE patients who received ESWT treatment had unilateral epicondylitis, 34.2% had bilateral epicondylitis, and the frequency of FMS in patients with bilateral epicondylitis was 19.2%, in our study. This difference may be due to the fact that some of the patients diagnosed with bilateral epicondylitis did not have LE and had FMS tender points that mimicked LE. The lateral epicondyle region, one of the common pain areas included in the Fibromyalgia Syndrome Diagnostic Criteria, can lead to diagnostic confusion and patients may have been mistakenly diagnosed with LE despite actually having FMS and may have received unnecessary ESWT treatment. It should be kept in mind that FMS may accompany patients with bilateral LE in particular, patients should first receive a comprehensive multidisciplinary management approach for fibromyalgia, including medication, exercise, lifestyle modification, and supportive therapies, and awareness should be raised about not

using the costly ESWT treatment unnecessarily. Therefore, routine screening for fibromyalgia in patients diagnosed with lateral epicondylitis is recommended in clinical practice.

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