THE EFFECT OF HYPOTHYROIDISM ASSOCIATION ON PAIN AND DEPRESSION IN PATIENTS WITH FIBROMYALGIA

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ABSTRACT

Introduction*: Fibromyalgia syndrome (FMS) is a non-inflammatory disease characterized by chronic widespread pain and sensitive spots of 3 months duration. Chronic musculoskeletal pain and fatigue are common symptoms in hypothyroidism. In this study, we aimed to investigate whether hypothyroidism in patients with fibromyalgia affects the severity and symptoms of fibromyalgia.*

Materials and method*: We conducted a cross-sectional. Ninety FMS patients between the ages of 25 and 65 years were included. The patients were divided into groups with hypothyroidism (60 patients) and without hypothyroidism (HT) (30 patients). Patients diagnosed with FMS according to the American College of Rheumatology (ACR) Fibromyalgia 2013 alternative diagnostic criteria (2013 AltCr). Pain intensity was assessed with Symptom Impact Questionnaire (SIQR) and Pain location inventory (PLI). Patients' depression was assessed by the Beck Depression Inventory (BDI). The quality of life of the patients was assessed by short form-12 (SF-12).*

Results*: SF-12 mental and physical scores of patients with FMS and HT were significantly lower (P: <0.001, P: 007, respectively). Likewise, PLI score and SIQR Symptoms score were statistically significant in FMS and HT group. However, there was no difference between the Beck depression scale scores of the groups.*

Conclusion*: HT affects both quality of life and pain severity negatively in patients with FMS. When planning the treatment of patients with FMS, it should be kept in mind that other systemic diseases other than the disease itself may affect pain and quality of life in fibromyalgia patients.*

Keywords: *Fibromyalgia, hypothyroidism, quality of life, Beck Depression Inventory.*

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Introduction

Fibromyalgia syndrome (FMS) is a widespread and chronic disease characterized by chronic widespread musculoskeletal pain persisting for longer than 3 months and hypersensitivity at some points of the body, which are called sensitive points[(1)].

In FMS patients, physical examination, laboratory findings, and radiological examinations are normal, although there are symptoms such as fatigue, sleep disturbance, headache, irritable bowel syndrome, paresthesia and anxiety[(2)].

The relationship between mental state and FMS is not clear. Depression is the most common psychological problem. In addition, panic and anxiety disorder, obsessive compulsive, neurosis are reported[(3)].

Primer hypothyroidism is an endocrine disorder that can affect the musculoskeletal system[(4)]. Although the etiologic cause is not fully understood, musculoskeletal system pain is common in thyroid diseases[(5)]. Muscle dysfunction has been reported in hypothyroid patients[(6)]. Symptoms such as insomnia, weight gain, chronic fatigue, headache, irritable bowel syndrome, mood disorders and arthralgia in hypothyroidism tend to overlap with fibromyalgia[(7)].

There are close similarities between the findings described in fibromyalgia and autoimmune thyroid diseases, especially hypothyroidism. Hypothyroidism, especially due to chronic autoimmune thyroid disease, is often seen as a symptom of persistent muscle pain, cramps, stiffness, fatigue and weakness[(8)].

A link between these two diseases is still Controversial but thyroid autoimmunity has been found to be more common (30-40%) in FMS patients[9].

Our aim in this study is to investigate the effect of hypothyroidism association on pain severity, quality of life and depression in patients with fibromyalgia.

Materials and methods

Subjects

Ninety FMS patients between the ages of 25 and 65 years were included. The patients were divided into groups with hypothyroidism (60 patients) and without hypothyroidism (30 patients). Patients diagnosed with FMS according to the American College of Rheumatology (ACR) Fibromyalgia 2013 alternative diagnostic criteria (2013 AltCr). The involvement of human subjects in this study was reviewed, approved, and monitored by the Institutional Review Board at the University. Before entry by signed consent, patient volunteers were fully informed of potential risks and benefits of the study as well as their rights as research study subjects. Serum free T3 (sT3), free T4 (sT4) and thyroid stimulating hormone (TSH) levels were measured in the patients and control group (TSH: thyroid stimulating hormone, fT3: free triiodothyronine, fT4: free trocine). Patients with increased TSH levels and low sT4 levels were considered subclinical hypothyroid patients with clinical hypothyroidism, thyroid hormone normal TSH levels increased, and these patients were included in the study.

Patients filled out the form containing age, height, body mass index (BMI), alcohol and cigarette. In the measured blood values; 25-hydroxyvitamin D levels (25OH-D), Erythrocyte Sedimentation Rate (mm/h) (ESR) and serum C-Reactive Protein (mg/dl) (CRP) levels were evaluated.

Clinical measures

Symptom Impact Questionnaire (SIQR) is identical to the Revised Fibromyalgia Impact Questionnaire [FIQR]. 10 separate scores will be collected and the total score will be between 0 and 100. This total score is divided by 2 and the SIQR symptom score is obtained. It consists of 10 individual scores and the range will be between 0 and 100. Divide this summated score by 2 to obtain the SIQR symptom score. Pain location inventory (PLI) consists from jaw, neck, mid-upper back, front of the chest, mid-lower back, upper back, lower back, shoulders, arms, hands, wrists, hips, thighs, knees, ankles, and feet like 28 localizations. The PLI score will be between 0 and 28[10].

Beck depression inventory

Beck Depression Inventory (BDI), developed for the first time by Beck et al., was used to determine the risk of depression and to measure the level of depressive symptoms and the severity of violence. [8]. BDI is a self-reported 21-item measure. Each item consists of 4 cumulants. These scores are ranked by neutral (0 points), the heaviest (3 points) and the highest score is 63. Those with a score of 17 or higher are defined as depression requiring treatment. BDI scores between 10 and 16 indicate mild depression. 26 These scores are 0-9 points (minimal depression), 10-16 points (mild depression) and 17-63 points (cut-off point and above). BDI has been found to be reliable and valid to assess the severity of depression in a Turkish population[11].

Short Form-12

In our study, the quality of life was assessed using a short form health scan (SF-12) with two main domains, a physical component score (PCS) and a mental component score (MCS), and eight scales to assess eight dimensions: physical function, physical role, social role, emotional role, physical pain, general health, vitality and mental health. Scores range from 0 to 100; where "0" indicates the worst case and "100" indicates the best possible case[12]. It is quicker to carry out in a short time and has proven its reliability and reliability for the replacement of the SF-36[13].

Statistical analysis

The calculations were performed using the Statistical Package for Social Sciences for Windows software version 16.0 (SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to confirm that data within the ranges of normal distribution in both groups. A non-parametric test was employed for the variables outside the normal distribution. The comparison of the data between the groups was carried out through the independent-samples t test. Statistical significance was based on a value of $p < 0.05$ with a 95% confidence interval.

Results

Ninety patients with my FMS were included. The mean age of the patients with FMS and HT was

46 ± 8,76 and the mean BMI was 28,84 ± 3,85. The mean age of patients with FMS alone was 44 ± 9.4 and the mean BMI was 46 ± 8.76. BMI was found to be significantly higher in the group with FMS and HT (p:<0.001). However, no significant difference was found between age, gender, smoking and alcohol drinking habits among the groups (Table 1).

Characteristics Mean±SD		FMS		HT and FMS		P
		n(%)	Mean±SD	n(%)		
Age (year)		44±9.4		46±8.76		0.263*
Sex						0.295**
	Female		56(93)		26(87)	
	Male		4(7)		4(13)	
BMI (kg/m²)		25.86±3.32		28.84±3.85		<0.001*
Smoking status						0.549**
	No		50(83)		24(80)	
	Yes		10(17)		6(20)	
Alcohol						0.477**
	No		59(98)		30(100)	
	Yes		1(2)		0(0)	

Table 1: Comparison of groups' demographics.
**: Independent Samples t-Test, **Chi-Square Tests, ESR: Erythrocyte Sedimentation Rate, CRP: C - reactive protein, TSH: Thyroid Stimulating Hormone, fT3: free Triiyodotronin, fT4: Free Thyroxine, SD: Standard Deviation*

When we looked at the laboratory values, there was no significant difference between the groups in terms of ESR, CRP, TSH, fT3, fT4, 25OH-D (Table 2).

Characteristics	FMS(n:60)	HT and FMS (n:30)	P*
	mean ±SD	mean ±SD	
ESR (mm/h)	14±9.32	15±9.31	0.588
CRP (mg/dL)	0.29±0.25	0.3±0.24	0.849
25OH-D (ng/mL)	29.83±11.09	36.49±21.18	0.115
TSH (mIU/mL)	2.36±1.39	1.86±1.4	0.114
fT3 (pg/mL)	4.39±0.64	4.6±0.43	0.067
fT4 (ng/dL)	14.83±2.46	14.01±2.65	0.152

Table 2: Laboratory parameters of patient and control groups.
P: Independent Samples t-Test, SD: Standard Deviation, FMS: Fibromyalgia syndrome, ESR: erythrocyte sedimentation rate, CRP: C-reactive protein, TSH: Thyroid Stimulating Hormone, fT3: free triiyodotronin, fT4: Free Thyroxine*

SF-12 mental and physical scores of patients with FMS and HT were significantly lower (p:<0.001, p:007, respectively). Likewise, PLI score and SIQR Symptoms score were significantly higher in FMS and HT group (p:<0.001, p:<0.001, respectively). However, there was no difference between the Beck depression scale scores of the groups (p: 0,971) (Table 3).

No correlation was found in the correlation analysis between FMS and HT patients with laboratory data and clinical tests (BDS score, SF-12, 2013 AltCr). However, in the analysis of the patients with FMS only, a significant positive correlation was found between TSH and SF-12 mental score (p = 0,002, r = 0,388) (Figure 1).

Testing parameters	FMS(n:60) mean ±SD	HT and FMS (n:30) mean ±SD	P*
BDS score	20.55±4.39	20.6±6.72	0.971
SF-12 mental score	42.62±6.58	35.57±8.73	<0.001
SF-12 physical score	43.09±6.99	38.93±6.14	0.007
PLI score	19.73±2.33	23.27±2.75	<0.001
SIQR Symptoms score	22.83±1.41	29.08±5.12	<0.001

Table 3: Comparison of BDS Score, SF-12, PLI Score and SIQR Symptoms Score.
P: Independent Samples t-Test, SD: Standard Deviation, BDS: Beck Depression Scale, SF-12: Short Form 12, PLI: 2013 Fibromyalgia alternative criteria Pain Location Inventory, SIQR: 2013 Fibromyalgia alternative criteria Symptom Impact Questionnaire.*

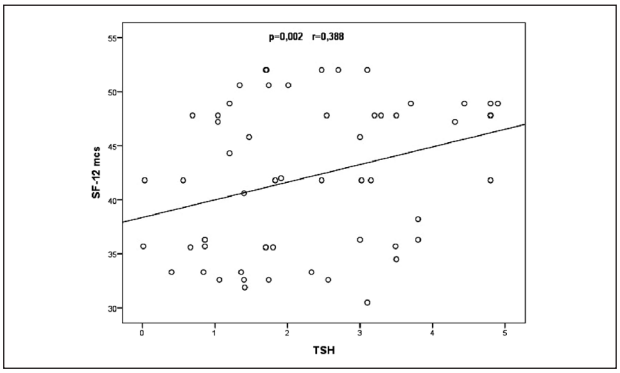

Fig. 1: Correlation between TSH score and SF-12 mental score of patients with FMS only.

Discussion

In this study, we aimed to investigate the effect of hypothyroidism on pain severity, quality of life and depression in patients with fibromyalgia. We found that SF-12 mental and physical scores of patients with FMS and HT were significantly lower, PLI score and SIQR Symptoms score were significantly higher. In patients with FMS only, we found a significant positive correlation between TSH and SF-12 mental score.

With a worldwide prevalence of 5%, the incidence of FMS is much higher in women than in men[14]. In our study, the incidence of FMS in accordance with the literature was higher in females than males.

There are some pathophysiological changes in pain and sensory transmission in the central nervous system of fibromyalgic patients. Elevated substance P levels have also been demonstrated in the CSF of FMS patients[15]. Nociceptive stimulants that normally do not cause pain cause pain in FMS patients. Central sensitization in the central nervous system is implicated in the increased susceptibility to pain in studies conducted by FMS[16, 17].

It is generally thought that FMS is not an inflammatory disorder, since FMS does not show any evidence of inflammatory damage to joints, muscles, or other tissues. Patients with FMS have symptoms resembling the symptoms of rheumatic diseases such as morning prisoners and musculoskeletal pain. Most studies have shown that FMS patients tend to be overweight and have lower quality of life and greater pain sensitivity[18]. In our study, the BMI of patients with FMS was found to be high. However, we found that patients with FMS and HT had a higher BMI than patients with FMS only.

The prevalence of psychiatric conditions such as depression, anxiety, panic disorder, posttraumatic stress disorder was found to be higher in fibromyalgic patients than in other rheumatologic diseases[18]. Previous researches have shown that a third of the patients may have depression, and there is a close relationship between FMS and depression. The prevalence of depression in FMS is up to 80%[19-21]. Depression has been shown to worsen fibromyalgic symptoms[22]. In our study, we also found that the depression scale was higher in patients with FMS[23].

Prevalence of fibromyalgia ranging from 30-40% in autoimmune thyroid dysfunction (ATD) has been determined. On the other hand, people with autoimmune thyroid disease and those with high antithyroid peroxidase have a higher prevalence of fibromyalgia[24].

In a study conducted by Nishioka et al., the prevalence of ATD was found to be higher in FMS patients[25]. However, in a study conducted by Suk JH et al., there was no correlation between serum antithyroid peroxidase titers and fibromyalgia[26]. It has been reported that Hashimoto disease can be observed with rheumatologic findings such as polyarthralgia, myalgia or sicca syndrome. A strong association was found between FMS and thyroid autoimmunity[27].

In the literature, in a study conducted by Pamuk et al. shows that there are no correlation between severity of fibromyalgia symptoms, depression score, and anti-thyroid peroxidase. Otherwise in a study conducted by Dardano et al. shows that there is a correlation between them[28, 29]. In our study, we found that FMS and HT were not higher on depression but beck depression scale was higher.

Bazzichi et al. in his work; Clinical evaluations was assessed by fibromyalgia impact questionnaire (FIQ) and pain intensity by visual analogue scale (VAS). Hashimoto syndrome of thyroiditis and fibromyalgia has been found to be more symptomatic, especially diffuse pain, fatigue, paresthesia, muscle spasms, tension headache, sleep disorder, behavioral disorders[30]. In our study, in the group with HT and FMS, 2013 fibromyalgia alternative criteria Symptom Impact Questionnaire scores were significantly higher than those with fibromyalgia only. In addition, Short form 12 mental score and Short form 12 physical score were significantly lower in the patient group with hypothyroidism and fibromyalgia.

Conclusion

FMS affects both quality of life and pain severity negatively in HT patients. When treating FMS patients one should always consider additional diseases such as HT. More sophisticated studies of etiology should be planned to find out why FMS and HT are more painful and affect quality of life.

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