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Research Article / Araştırma Makalesi

Telogen Effluvium Tanısı Alan Hastalarda Tiroid Fonksiyon Bozukluklarının ve Vitamin Eksikliğinin Etiyolojik Rolü

The Etiological Role of Thyroid Dysfunction and Vitamin Deficiency in Patients with Telogen Effluvium

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Abstract: Telogen effluvium (TE) is one of the most common forms of non-scarring alopecia. This study aims to examine the proportion of vitamin B12 deficiency, vitamin D deficiency, iron deficiency, and thyroid dysfunction in patients with TE. This retrospective observational study reviewed the records of 151 patients with TE who were admitted to our hospital from January 2016 to December 2019. The histories, medications and laboratory findings of the patients regarding etiology were evaluated. Ferritin, vitamin B12, vitamin D, TSH, sT4 of the patients were recorded. The median age of 151 patients was 29 (18 – 67). 22% of patients had vitamin B12 deficiency, 34% had a folic acid deficiency, 93.5% had vitamin D deficiency, and 68.5% had iron deficiency and 22.5% were anemic. While 117 (77.5%) of the women were premenopausal, 34 (22.5%) were postmenopausal. There were 23 (15.2%) patients with thyroid dysfunction, 2 had subclinical hyperthyroidism, 2 had hypothyroidism, and 19 had subclinical hypothyroidism. Study findings were obtained in our study that vitamin D and vitamin B12 deficiency, iron deficiency, and thyroid dysfunction may be associated with TE.
Keywords: Hyperthyroidism, hypothyroidism, iron defficiency, vitamin B12, vitamin D, telogen effluvium

Özet: Telojen effluvium (TE), skarlaşmayan alopesi'nin en yaygın formlarından biridir. Bu çalışma TE'li hastalarda B12 vitamini eksikliği, D vitamini eksikliği, demir eksikliği ve tiroid fonksiyon bozukluğu oranlarını incelemeyi amaçlamaktadır. Bu retrospektif gözlemsel çalışmada Ocak 2016-Aralık 2019 tarihleri arasında hastanemize başvuran 151 TE'li hastanın kayıtları gözden geçirilmiştir. Etiyolojiye yönelik hastaların öyküleri, ilaçları ve laboratuvar bulguları değerlendirilmiştir. Hastaların ferritin, B12 vitamini, D vitamini, TSH, sT4, sT3, tiroid otoantikorları (anti-TPO, anti-tiroglobulin, TSH reseptör bloker antikoru) hastane sisteminden kaydedildi. 151 hastanın ortanca yaşı 29 (18-67) idi. Hastaların% 22,0'sinde B12 vitamini eksikliği,% 34,0'ünde folik asit eksikliği,% 93,5'inde D vitamini eksikliği,% 68,5'inde demir eksikliği ve % 22,5'i anemik idi. Kadınların 117'si (% 77,5) premenopozal iken 34'ü (% 22,5) menopoz sonrası idi. Tiroid fonksiyon bozukluğu olan 23 (% 15,2) hasta, 2'sinde subklinik hipertiroidi, 2'sinde hipotiroidi ve 19'unda subklinik hipotiroidi vardı. Çalışmamızda D vitamini ve B12 vitamini eksikliği, demir eksikliği ve tiroid fonksiyon bozukluğunun TE ile ilişkili olabileceğine dair bulgular elde edilmiştir.
Anahtar Kelimeler: Hipertiroidizm, hipotiroidizm, demir eksikliği, B12 vitamini, D vitamini, telogen effluvium

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1. Introduction

Telogen effluvium (TE) is one of the most common forms of non-scarring alopecia (1). TE is a diffuse-style hair loss that occurs approximately three months after a triggering event and is usually self-limited, lasting about six months (2). Hair loss in TE is generally less than 50% of scalp hair (1).

Fever infections (tuberculosis, typhoid), major surgery, emotional stress, traumas, oral retinoids, antithyroid drugs, anticonvulsants, thyroid dysfunction, chronic kidney failure, liver failure, iron deficiency, zinc deficiency, malnutrition, autoimmune diseases are included in TE etiology (1, 2). To clarify the etiology, it is recommended to conduct appropriate laboratory examinations after a comprehensive anamnesis to exclude endocrine, nutritional and autoimmune disorders (1, 2).

Although many previous studies have shown a relationship between TE and vitamin-mineral deficiencies, especially vitamin D, ferritin, vitamin B12, folate, and zinc, some studies report otherwise (3, 4). Thyroid dysfunction (especially hypothyroidism) also plays a role in TE etiology (1).

In this study, we aim to investigate the relationship between TE and thyroid dysfunction and vitamin deficiency in our center. Accordingly, we wanted to examine the proportion of vitamin B12 deficiency, vitamin D deficiency, iron deficiency, and thyroid dysfunction in patients with TE.

2. Material and Methods

This retrospective observational study reviewed the records of 151 patients with TE who were admitted to our hospital from January 2016 to December 2019. The institutional ethical review board approved the study. Inclusion criteria were age ≥ 18 years, applying for hair loss, admitting dermatology outpatient clinic with TE ICD diagnosis code, and having at least one thyroid function test (TSH, free T4), serum vitamin D, vitamin B12 tests. Exclusion criteria were the reason for hair loss other than TE is stated in the patient anamnesis, inadequate data about patients, having cancer, usage of chemotherapy.

ICD-10 diagnostic codes searched Telogen Effluvium from the hospital automation system. The diagnosis of TE was confirmed by examining the outpatient clinic notes of the patients found with this method. The etiology of the patients' history information, medications, and laboratory findings were conducted. Age, gender, comorbidity, drugs, hemoglobin, leukocyte, neutrophil, ferritin, vitamin B12, vitamin D, TSH, sT4 of the patients were recorded. The rate of thyroid dysfunctions and vitamin deficiencies was determined.

This study was appoved by Dr Abdurrahman Yurtaslan Oncology Training and Research Hospital Ethical Committee (No:2020-07/692, date: 08/07/2020).

Statistical Analysis

Data were analysed using IBM SSPS Statistics for Windows v. 20.0 software (IBM Corp., Armonk, NY). Qualitative variables were expressed as frequencies and percentages; quantitative variables as median (IQR or interquartile range). The conformity of numerical data to a normal distribution was assessed using the Kolmogorov-Smirnov test.

3. Results

The median age of 151 patients was 29 (18 – 67). When the known comorbidities of the patients were examined, 11.9% had Diabetes Mellitus (DM), 9.9% had hypertension (HT), 7.9% had hypothyroidism, and 7.9% had bipolar disorder, and 62.4% of the patients were non-smokers, Table 1).

Laboratory findings of the patients were shown in Table 2. 22% of patients had vitamin B12 deficiency, 34% had a folic acid deficiency, 93.5% had vitamin D deficiency, and 68.5% had iron deficiency and 22.5% were anemic (Table 3). While 117 (77.5%) of the women were premenopausal, 34 (22.5%) were postmenopausal. There were 23 (15.2%) patients with thyroid dysfunction, 2 had subclinical hyperthyroidism, 2 had hypothyroidism, and 19 had subclinical hypothyroidism.

Table 1. Demographic and clinical features of patients

	n:151
Age, median (range)	29 (18 – 67)
Comorbidity, n (%)	
DM	18 (11.9)
HT	15 (9.9)
Hypothyroidism	12 (7.9)
Bipolar disorder	12 (7.9)
Absence	94 (62.4)
Smoking, n (%)	
Active	35 (23.2)
Ex-smoker	10 (6.6)
Never	106 (70.2)
DM, Diabetes Mellitus; HT, Hypertension.	

Tablo 2. Laboratory findings of patients

	n:151
Hemoglobin	12.6 ± 1.16
MCV	82.5 ± 10.15
Platelet	284 ± 70.0
Leukocyte	7.12 ± 1.94
Neutrophil	4.09 ± 1.52
Lymphocyte	2.32 ± 0.65
Vitamin B12	305 ± 138.3
Folic acid	6.06 ± 2.92
Vitamin D	11.7 ± 7.22
TSH	3.4 ± 6.29
sT4	1.15 ± 0.19
MCV, Mean corpuscular volüme; TSH, Thyroid stimulating hormone	

Table 3. Vitamin deficiency, iron deficiency, and thyroid disfunction rates

	n:151 (%)
Vitamin B12 deficiency	35 (23.2)
Folic acid deficiency	57 (38.0)
Vitamin D deficiency	143 (97.3)
Iron deficiency	134 (88.7)
Thyroid dysfunction	23 (15.2)

4. Discussion and Conclusion

In this study, the clinical and laboratory features of patients who were followed-up with TE diagnosis in our center were examined. The majority of patients had vitamin D deficiency and iron deficiency.

In vitamin D deficiency, symptoms such as pain and myalgia are seen especially in the musculoskeletal system (5). Vitamin D has also been shown to play a role in the growth of mature hair follicles (4). Studies have shown that there may be a relationship between serum vitamin D level and TE (6, 7). In the study where Rasheed et al. investigated the relationship between vitamin D level and hair loss, they showed that serum vitamin D level was low in those with TE or female type hair loss compared to the control group (7). In their study, which included 63 TE patients, Karadağ et al. showed that serum vitamin D levels were lower in TE patients than in the control group (8). Vitamin D deficiency is a common condition in the community (9). In a meta-analysis, it was stated that 64.7% of Turkish women had vitamin d deficiency (9). In this study, serum vitamin D deficiency was present in more patients (97.3%) compared to vitamin D deficiency observed in the community (9).

There are limited studies on the relationship between vitamin B12 levels and hair growth. Özden et al. found vitamin B12 deficiency as 2% in those with diffuse-type hair loss. In the study where Ertug et al. evaluated the laboratory findings of patients with TE, serum vitamin B12 level was shown to be lower in patients with TE compared to the control group. In our study, serum vitamin B12 deficiency was found in 23.2% of patients. These results suggest that there may be a relationship between serum vitamin B12 and TE. Although it is included in various supplements that have been tried in TE treatment, there is no study to reveal the relationship between folic acid and TE. In presented study, folic acid deficiency was found to be 0.6%.

Studies are showing that iron deficiency and iron deficiency anemia plays a role in TE etiology (8, 10). In the study conducted by Karadağ and colleagues, anemia was detected more in TE patients compared to the control group (8). As a result of the regression analysis, it has been shown that anemia can be an independent risk factor for TE (8). In addition, the ferritin level of TE patients was found to be significantly lower compared to the control group in the same study (8). Deloche et al. showed that iron deficiency was a risk factor for hair loss in the study they included 5110 patients (10). Small studies that iron replacement can be effective in TE's treatment also support that iron deficiency may be a risk factor for TE (8, 11). In this study, 22.5% of patients were anemic. Iron deficiency was present in 88.7% of the patients. It was thought that anemia and iron deficiency may be one of the important risk factors for TE.

One of the skin manifestations of hypothyroidism is the changes that occur in the hair (dry, thin, and shedding hair) (12). Studies support the relationship between thyroid dysfunction and diffuse-type hair loss, although its mechanism remains to be fully understood (13). Hypothyroidism causes increase in number of telogen hair, explaining increased hair loss (14). Poonia et al. detected subclinical hypothyroidism in 11% of patients in their study, including 100 diffuse-type hair loss patients (78% with a diagnosis of TE) (13). The exclusion of patients with known hypothyroidism in this study may have reduced the proportion of patients with hypothyroidism (13). In the current study, 23 (15.2%) patients with thyroid dysfunction were present. Of these patients, 2 had subclinical hyperthyroidism, 2 had hypothyroidism, and 19 had subclinical hypothyroidism. Eight of the patients with subclinical hypothyroidism were taking levothyroxine with the diagnosis of hypothyroidism.

Our study had some limitations. The generalizability of the findings obtained is controversial since the absence of a control group and the retrospective design of the study. The absence of follow-up and treatment

information of patients prevented us from showing the role of vitamin deficiency and thyroid dysfunction accused etiologically.

In conclusion, findings were obtained in our study that vitamin D and vitamin B12 deficiency, iron deficiency, and thyroid dysfunction may be associated with TE. Conducting prospective studies in which laboratory findings will be compared with the control group, and follow-up and treatment information may be useful in clarifying TE's etiology.

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