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CASE REPORT
OLGU SUNUMU

Oral Isotretinoin Intake and Thyroiditis: Exploring the Association of a Rare Side Effect

Oral İzotretinoin Alımı ve Tiroidit: Nadir Bir Yan Etki İlişkisini Araştırmak

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ABSTRACT

Isotretinoin has been widely used to treat severe and resistant acne. While it has many beneficial effects, it is not without undesirable consequences. Most commonly, hypothyroidism has been reported as an adverse effect on the thyroid hormone pathway, which is an infrequent presentation of isotretinoin intake. In this report, we present the case of a 21-year-old woman who had taken oral isotretinoin for severe acne vulgaris for one month and subsequently complained of palpitations. On physical examination, tachycardia was noted. Laboratory tests and imaging results were consistent with thyroiditis. After discontinuing isotretinoin treatment, all symptoms and laboratory test results improved within one month. Hyperthyroidism is a rare adverse effect associated with isotretinoin treatment. Therefore, it is recommended to closely monitor thyroid function tests at more frequent intervals during the course of isotretinoin treatment.

Keywords: Isotretinoin, thyrotoxicosis, thyroiditis

ÖZ

İzotretinoin şiddetli ve dirençli akne tedavisi için yaygın olarak kullanılmaktadır. Birçok faydalı etkisi olmasına rağmen, istenmeyen sonuçlar olabilmektedir. İzotretinoin kullanımına bağlı tiroid hormon aksı üzerinde en sık hipotiroidizm advers etki olarak rapor edilmiştir. Bu vaka bildiriminde, şiddetli akne vulgaris için bir ay boyunca oral izotretinoin alan 21 yaşındaki çarpıntı şikayeti olan bir kadın hasta sunulmaktadır. Fizik muayenede taşikardi saptanmıştır. Laboratuvar testleri ve görüntüleme sonuçları tiroidit ile uyumludur. İzotretinoin tedavisi kesildikten sonra, tüm semptomlar ve laboratuvar test sonuçları bir ay içinde düzelmiştir. Hipertiroidizm, izotretinoin tedavisi ile ilişkili nadir bir advers etkidir. Bu nedenle, izotretinoin tedavisi sürecinde tiroid fonksiyon testlerinin daha sık aralıklarla yakından izlenmesi önerilir.

Anahtar Kelimeler: İzotretinoin, tirotoksikozis, tiroidit

INTRODUCTION

Isotretinoin is a curative treatment for moderate acne. Nevertheless, despite the established efficacy of isotretinoin in the treatment of acne, there exists a multitude of unforeseen adverse effects, including but not limited to allergic reactions, tinnitus, gastrointestinal disturbances, impaired nocturnal visual perception, photosensitivity, exacerbation of acne, and instances of palpitations, as reported in the literature (1,2). Fatigue, headache, mouth and eye dryness, and skin exfoliation are some of the frequent but disturbing adverse effects. Patients often tolerate these side effects in pursuit of improved skin health. However, some biological adverse effects have been reported, which can disrupt the functionality of the human body (3,4). Many of these effects have been observed during isotretinoin treatment (5).

As isotretinoin is fat-soluble and distributes to various tissues, numerous side effects can arise depending on the organs affected (6). Among these, the thyroid gland has been identified as a potential target. Hypothyroidism is a common occurrence in the reported cases (3), while thyrotoxicosis, a condition where there are elevated levels of thyroid hormones in the blood due to damaged thyroid cells, is a rare but serious complication.

While many groups of medications have been associated with thyrotoxicosis, there are not enough case reports linking it to isotretinoin use. Therefore, this case report provides valuable insights beyond current expectations.

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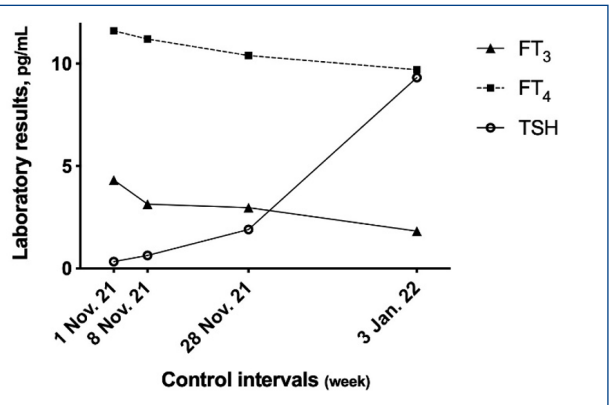
CASE REPORT

A 21-year-old female patient presented with severe acne vulgaris that had been refractory to treatment since 2018. She had previously received tetracycline and azithromycin therapies without success. In October 2021, the patient began taking oral isotretinoin, a dermatologist prescribed. Prior to initiating the treatment, the patient underwent a series of laboratory tests, including assessments of liver and kidney function, thyroid function, and a complete blood count, all of which yielded normal results. Isotretinoin was initiated by the dermatologist at an initial dosage of 10 mg once daily (below the recommended dose for acne treatment) and was increased to twice daily after one week.

However, during the third week of treatment, the patient experienced severe palpitations, fatigue, hair loss, and headaches. A physical examination revealed a pulse rate of 116 bpm and sweaty skin but no objective hair loss. On November 1, 2021, thyroid function tests were conducted, which revealed low levels of thyroid-stimulating hormone (TSH) = 0.07 mIU/L, (normal range 0,35-4,94), slightly elevated levels of free thyroxine (FT4) = 1.16 ng/dL, (normal range 0,61-1,12), and elevated levels of free triiodothyronine (FT3) = 4.32 pg/mL, (normal range 1,71-3,71), indicating a diagnosis of T3-T4-thyrotoxicosis. A radioactive iodine uptake study was also performed, which showed no nodules but revealed suppressed parenchyma. No nodules or volume enlargement were reported in the thyroid ultrasonography. Regrettably, the patient did not experience any significant improvement in her acne formation.

Subsequent to the discontinuation of isotretinoin treatment, thyroid function tests were repeated on November 8, 2021. The patient's complaints had resolved, and the TSH level had increased to 0.13 mIU/L, while the FT4 level had slightly decreased to 1.12 ng/dL. At the last control on November 28, 2020, the patient's thyroid function tests showed normal euthyroid status with a TSH level of 0.39 mIU/L and an FT4 level of 1.04 ng/dL. The patient's thyroid function was normal in the last control test in January 2021, with a TSH level of 1.91 mIU/L. The effect of thyroid cell damage on laboratory results over time is detailed in **Figure 1**.



FT$_3$, free triiodothyronine; **FT$_4$**, free thyroxine; **TSH**, thyroid-stimulating hormone

Figure 1. Variations in thyroid function test results during the presentation of the side effect and discontinuation of isotretinoin therapy.

DISCUSSION

The focus of this discussion is to consider the potential adverse effects of isotretinoin when prescribed. There have been many reports of side effects related to isotretinoin use, and the relationship between isotretinoin and autoimmune disorders is well known. In particular, gastrointestinal system problems are the most common unwanted presentations of isotretinoin intake (7). Popescu (2011) demonstrated that irritable bowel syndrome (IBS) is the leading complaint caused by isotretinoin (7). Conversely, the risk of IBS is dose-dependent, and discontinuation of treatment can lead to patient recovery. Gursoy (2012) drew our attention to several synchronous side effects of isotretinoin use (8), including autoimmune thyroiditis and ocular myasthenia gravis, which developed in the third week of isotretinoin use. Moreover, further medication was needed to recover from both complications, such as botulinum toxin A, prednisolone, and anti-thyroid treatment. In a case report, a higher level of TSH was noticed, as expected, in a young patient with complaints of menorrhagia and weight gain after isotretinoin use for 6 months (3). In another case reported by Minuk et al. (4), thyrotoxicosis was revealed in a young man who complained of fatigue and heat intolerance and had taken isotretinoin treatment for a month.

The common point in all these cases is that patients received drug treatments for at least one month, and the side effects occurred indirectly. Sometimes isotretinoin directly damages tissues, and local adverse effects may happen at that time. In their review, Brezezinski et al. (2017) identified the local and systemic adverse effects of using isotretinoin. Dermal complaints were numerically higher than the other systems (9). A housewife with serious hoarseness during isotretinoin treatment recovered three weeks after discontinuing isotretinoin (10). In most cases, the side effect disappears after the treatment is stopped. Some of them require further medication.

Like these uncommon reports, our case report is a result of the destruction of the thyroid gland by isotretinoin. Our patient had complaints within three weeks after starting the treatment. Although the laboratory tests were compatible with the early stages of thyrotoxicosis, she was symptomatic and had to perform the tests. If the tests were done later, an obvious thyrotoxicosis could be detected. Our case was presented with hyperthyroidism rather than hypothyroidism, which is not a common side effect. All of the cases had been taking isotretinoin for at least three weeks, so there should be an accumulation time for triggering the clinical or biochemical damages.

These clinics may also consider the possibility that the increased prevalence of hypothyroidism in isotretinoin treatment could be attributed to chronic destruction of the thyroid gland, leading to its impairment. Furthermore, during the process of destruction, some patients might manifest evident hyperthyroidism, while others may present with subacute clinical features.

We may have rushed to do the initial tests after starting the isotretinoin treatment, but the presence of the patient's hyperthyroid clinic made us perform the tests earlier. In conclusion, isotretinoin still maintains its reputation for having beautiful skin without a knife. However, humanity can exacerbate the immune system for the sake of beauty. Both clinicians prescribing isotretinoin and patients should be alert for this potential risk. Therefore, it would be appropriate to repeat laboratory tests monthly.

ETHICAL DECLARATIONS

Informed Consent: The patient signed the informed consent form.

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