

CASE REPORT

Baclofen-induced excessive perspiration: A case report and review of literature

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Key Clinical Message

This report highlights an unexpected baclofen side effect, a medication known for its safety profile. The rarity of excessive perspiration as a side effect distinguishes this case from typical baclofen adverse reactions. Documenting uncommon reactions is vital for physicians to broaden their awareness of baclofen's side effects and improve care.

KEYWORDS

baclofen, GABA type B receptor, hyperhidrosis, side effects

1 | INTRODUCTION

Baclofen has been a widely used medication indicated for conditions such as flexor spasms, concomitant pain, and multiple sclerosis for over 50 years. This drug is a GABA type B receptor subunit agonist that acts on neurons of the levels of the brain and spinal cord.¹ The mechanism of action as an analgesic medication is not fully understood, however, it is hypothesized that it causes an increase of inhibitory activity that is sufficient to disrupt the neuronal activity cascade that leads to disruption of nociceptive pathways which is necessary for the development of neuropathic pain.² Common adverse effects of Baclofen include transient sedation,

confusion, muscle weakness, vertigo, and nausea³ hypothermia⁴ and hyperpyrexia when administered intrathecally.¹ However, hyperhidrosis is not frequently reported as an adverse effect of Baclofen.¹

The precise etiology of primary hyperhidrosis is unclear however, in contrast, secondary hyperhidrosis is commonly attributed to factors such as, medications like dopamine agonists and antipsychotics, systemic disorders including hyperthyroidism, diabetes mellitus, and Parkinson's disease, as well as tumors like lymphoma and pheochromocytoma.⁵ Regardless of the etiology, excessive perspiration can significantly impact patients, causing considerable distress due to limitations in performing daily tasks, such as gripping the steering wheel for driving.

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This report delves into the case of a 63-year-old woman experiencing excessive perspiration induced by Baclofen.

2 | CASE DESCRIPTION

2.1 | History, examination, investigations, and treatment

This is a case of a 63-year-old woman with a medical history encompassing diabetes mellitus, essential hypertension, Hashimoto's thyroiditis, and chronic back pain stemming from a motor vehicle accident two decades ago and no significant travel history outside the United States. Due to persistent back pain, the patient employs two spinal stimulators and has been using muscle relaxants on a long-term basis. Additionally, she underwent a total hysterectomy with oophorectomy 21 years ago. In October 2022, the patient visited the clinic reporting excessive sweating that commenced a year earlier but intensified recently, describing it as a constant state of being drenched in sweat. She had not experienced such symptoms previously. During the examination, notable findings included hot flashes and vaginal dryness. There were no recent alterations in weight, palpitations, changes in bowel habits, or other hyperthyroidism-related symptoms. The patient's home medications are detailed in Table 1. The symptoms were attributed to the postmenopausal state. The patient was initiated on a daily dose of venlafaxine at 37.5 mg and scheduled for a follow-up appointment in 4 weeks.

During the subsequent visit in November 2022, the patient conveyed that her excessive sweating persisted, and she continued to experience being consistently "soaked in sweat." No discernible side effects were noted. In response, we elevated the dosage of Venlafaxine to 37.5 mg twice daily. The patient had been taking amitriptyline at 25 mg for neuropathy, and we initiated a gradual tapering process while closely monitoring for any emerging

symptoms. The patient was provided with Amitriptyline 10 mg pills. Additionally, a comprehensive set of tests including CBC, CMP, TSH, Free T3, and T4 were conducted, and a follow-up appointment was scheduled for 4 weeks later.

During that examination, the laboratory findings indicated TSH levels at 1.629 mIU/L (within the range of 0.36–3.74), Free T4 at 0.84 ng/dL (within the range of 0.76–1.46), Free T3 at 2.52 pg/mL (within the range of 2.18–3.98), and Hemoglobin at 11.7 mg/dL (within the range of 12.0–15.0). The remaining assessments, including white blood cells (WBC), and peripheral blood smear revealed no abnormalities and liver and kidney functions were within normal limits. Despite the normal thyroid function results, the patient mentioned that she does not regularly consult with an endocrinologist and occasionally adjusts her medication when feeling unwell. It was emphasized to her that her thyroid levels are well-regulated, and she should adhere to her prescribed dosage of Levothyroxine at 112 mcg and Liothyronine at 5 mcg twice daily.

In December 2022, during the subsequent follow-up, the patient's quality of life remained impacted by persistent perspiration. A differential diagnosis was considered, encompassing the possibilities of overusing thyroid medications and the postmenopausal state. Despite ongoing thyroid tests yielding normal results, and the patient's adherence to her thyroid medications, the prescribed Venlafaxine at 37.5 mg twice daily proved ineffective. Consequently, the dosage was escalated to 75 mg twice daily, and a follow-up appointment was scheduled for 4 weeks later.

In January 2023, as hyperhidrosis persisted without improvement, the decision was made to explore alternative possibilities. Consequently, we initiated tests to rule out various differentials. ACTH and AM Cortisol assessments were conducted to investigate potential adrenal pathology, while plasma serotonin levels were evaluated to exclude carcinoid syndrome. Additionally, CBC, CMP, and a peripheral blood smear were performed to assess for blood-related issues, and thyroid function was reassessed with TSH, Free T3, and Free T4 tests. The results revealed a WBC count of 10.1 thousand/ μ L (within the range of 3.8–10.8), Hemoglobin at 13.1 mg/dL (within the range of 11.7–15.5), mildly elevated AM Cortisol at 23.2 mcg/dL (within the range of 4.0–22.0), ACTH at 16 pg/mL (within the range of 6–50), Free T3 at 3.1 pg/mL (within the range of 2.3–4.2), Free T4 at 1 ng/dL (within the range of 0.8–1.8), and TSH at 4.15 mIU/L (within the range of 0.4–4.5). Serum serotonin was below the normal range at <10 ng/mL (within the range of 56–244). Notably, there was no significant recent weight loss. The patient had also not used her thyroid medications for 3 weeks, suspecting them as a potential cause of her symptoms; however, the

TABLE 1 Home medications.

Medication	Dosage
Telmisartan	80 mg daily
Amitriptyline	25 mg daily
Bupropion	150 mg daily
Gabapentin	300 mg daily
Levothyroxine	112 mcg daily
Liothyronine	5 mcg twice daily
Trazadone	50 mg daily
Metformin	1000 mg twice daily
Venlafaxine	37.5 mg once daily
Baclofen	10 mg once daily

hyperhidrosis persisted. The patient was referred for a mammogram, which returned normal results without any detected abnormalities. Furthermore, the patient had undergone a colonoscopy 3 years prior, which also returned normal results without any abnormalities detected.

2.2 | Outcome and follow-up

The patient returned for a follow-up after 2 weeks, expressing persistent dissatisfaction with hyperhidrosis and noting no improvement. Consequently, we opted to discontinue Baclofen, as its association with sweating was mentioned in the medication's information, despite the absence of supportive studies in the literature. The patient was instructed to return for another follow-up in 3 weeks. In February 2023, during the subsequent visit, the patient reported a resolution of sweating and the absence of hot flashes. Consequently, the hyperhidrosis was attributed to the side effect of Baclofen. It is noteworthy to mention that the patient did not exhibit any withdrawal symptoms, likely attributed to her very low dosage. Consequently, a gradual tapering off of the medication was not deemed necessary or recommended.

Before experiencing these symptoms, the patient had been using Baclofen for 5 years without any issues; she had previously tolerated the medication well with no reported side effects. Prior to Baclofen usage, the patient had used cyclobenzaprine for nearly 10 years, discontinuing it due to perceived ineffectiveness. Interestingly, around the time of stopping cyclobenzaprine, she noted mild to moderate sweating. Additionally, it is worth noting that after stopping Baclofen, we tried Tizanidine, which caused a similar problem. However, the subsequent introduction of methocarbamol did not result in comparable side effects and has been continued without any issues for almost 9 months. Lastly, the patient was on three serotonergic drugs (venlafaxine, trazadone, and amitriptyline) which increases concern for development of serotonin syndrome; however, the symptom of excessive sweating ceased only after discontinuing baclofen, indicating baclofen as the primary cause.

3 | DISCUSSION

The patient experienced excessive perspiration as a rare adverse effect associated with taking Baclofen. Typically, this condition is caused by the overstimulation of eccrine sweat glands by cholinergic sympathetic overactivity, leading to excessive acetylcholine release. Impaired negative feedback to the hypothalamus may cause excessive sweating, triggered by medications or systemic disorders

increasing acetylcholine release and sympathetic response.⁵ The patient was worked up for many common causes of hyperhidrosis such as adrenal pathology, hyperthyroidism, and serotonin syndrome, however, the results of these studies were negative. Additionally, the patient underwent age-appropriate screenings for malignancies. After excluding more plausible causes for this symptom, baclofen was withdrawn which led to the cessation of her symptoms. A diagnosis of excessive perspiration secondary to baclofen was made, which was a diagnosis of exclusion. This case report highlights the occurrence of an unlikely adverse effect of baclofen. Commonly reported adverse effects of baclofen include temporary sedation, confusion, muscle weakness, vertigo, and nausea. Uncommon effects involve neuropsychiatric impairment, hypotension, peripheral edema, respiratory problems, seizures, and various other symptoms.¹ However, the frequency of patients experiencing excessive perspiration because of taking baclofen is not easily obtainable—most case studies involving this drug label excessive perspiration as a rare side effect, and often it is not mentioned at all. An extensive review of medical literature does not reveal any documented cases of excessive perspiration attributed to patients taking baclofen. This case report aims to establish literature that notes this adverse effect and serves as a branching point for future studies to study the incidence and prevalence of excessive perspiration.

As previously noted, excessive perspiration proves highly incapacitating, damaging various aspects of individuals' lives, including mental well-being, social interactions, relationships, and employment.⁶ However, unfortunately, there are barriers to these patients obtaining care. The misinformation and societal stigma surrounding sweating, seeing it as unhygienic, creates a barrier that regrettably deters individuals from seeking medical assistance.⁶ Research indicates that the impact of excessive perspiration on quality of life is comparable to that of chronic conditions like rheumatoid arthritis and kidney failure.⁷ Given the significant impact of a condition on a patient's life, especially when not closely linked to commonly used medications, our findings underscore the necessity to address the data gap in this area.

4 | CONCLUSIONS

This case report illustrates the clinical impact of Baclofen-induced excessive sweating, showcasing the infrequency of this adverse effect and underscoring its potential underreporting in existing literature. By presenting a diagnostic challenge and the subsequent resolution upon Baclofen withdrawal, the case report emphasizes the need for increased awareness among healthcare professionals

regarding unusual side effects associated with commonly prescribed medications. The study's significance lies in filling the knowledge gap regarding the incidence and prevalence of excessive perspiration linked to Baclofen, a critical step toward understanding the full spectrum of its effects. This research sheds light on the profound impact of excessive perspiration on patients' lives and advocates for increased awareness, accessibility to treatment, destigmatization, and further investigation into the prevalence of medication-induced perspiration to improve patient outcomes and quality of life.

AUTHOR CONTRIBUTIONS

Othman Farahneh: Conceptualization; methodology; writing – original draft; writing – review and editing. **lois Akpati:** Conceptualization; writing – original draft. **Miguel Alvarez silva:** Conceptualization; writing – original draft. **Ahmad Damlakhy:** Conceptualization; methodology; writing – original draft; writing – review and editing. **Emily Ross:** Conceptualization; data curation; investigation; writing – review and editing.

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The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data used to support this study are included within the article. Further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Not applicable.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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