Cureus
Part of SPRINGER NATURE

Open Access Case Report

# Bupropion-Associated Hyponatremia: A Case Report and a Review of the Literature

Baraa A. Albarakati [1], Amani S. Almwled [2], Alhanouf S. Alharthi [2]

1. Psychiatry, King Fahd Armed Forces Hospital, Jeddah, SAU 2. Psychiatry, King Abdullah Medical City, Makkah, SAU

**Corresponding author:** Baraa A. Albarakati, baraakati@gmail.com

**Review began** 10/12/2026
**Review ended** 11/09/2026
**Published** 11/12/2026

© **Copyright** 2026
Albarakati et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**DOI:** 10.7759/cureus.119555

## Abstract

Hyponatremia is a known complication of antidepressants, but its association with bupropion is not well-documented. This report presents a rare case of hyponatremia following bupropion initiation in Saudi Arabia, contributing to the sparse literature on this adverse drug reaction. A 47-year-old Afghan woman with a history of depression and other medical conditions developed severe hyponatremia, characterized by confusion and a seizure, approximately 30 days after initiating bupropion 150 mg daily. Investigations showed a serum sodium concentration of 108 mmol/L and serum osmolality of 238 mOsm/kg. Bupropion was discontinued, and treatment included 0.9% and 3% sodium chloride with serial sodium monitoring. Her confusion subsequently resolved, and serum sodium was 132 mmol/L at psychiatric reassessment. Clinical features included female sex, immobility, and a history of hyponatremia during selective serotonin reuptake inhibitor treatment. The review of similar cases suggests a pattern of symptoms and recovery linked to bupropion, underscoring its potential role in triggering hyponatremia. This case study and literature review emphasize the importance of considering bupropion as a possible cause of hyponatremia, especially in patients with multiple risk factors. It calls for increased vigilance and sodium level monitoring in these patients.

**Categories:** Psychiatry
**Keywords:** adverse drug reaction, antidepressants, bupropion, delirium, electrolyte imbalance, hyponatremia

## Introduction

Hyponatremia, defined as a serum sodium concentration below 135 mmol/L, is a common electrolyte disturbance in clinical practice [1]. Its manifestations range from mild or nonspecific symptoms to confusion, seizures, and impaired consciousness, depending on its severity and rate of development [2]. Marked reductions in serum sodium, particularly to 120 mmol/L or lower, may be accompanied by severe neurological manifestations [2]. Hyponatremia has also been associated with increased mortality; a meta-analysis reported a relative risk of 2.60 (95% confidence interval, 2.31-2.93), although this association does not establish causation [3]. Potential contributors include medications, excessive water intake, renal or hepatic disease, and endocrine disorders [2].

Antidepressant-associated hyponatremia has been described across several drug classes, including selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors, and tricyclic antidepressants [4,5]. Drug surveillance data have identified hyponatremia during psychopharmacological treatment [6], while observational studies have reported an increased risk associated with serotonergic antidepressants, particularly in older patients [7,8]. Escitalopram-associated severe hyponatremia has also been described in case reports [9]. Reports involving other antidepressants, including lofepramine, indicate that this adverse event is not confined to SSRIs [5,10].

Bupropion primarily inhibits norepinephrine and dopamine reuptake. Hyponatremia has been reported during bupropion treatment, but the evidence is comparatively limited, and the underlying mechanism remains uncertain [11]. We describe severe symptomatic hypotonic hyponatremia occurring approximately one month after bupropion initiation in a 47-year-old woman with substantial medical comorbidity and previous episodes of hyponatremia during escitalopram treatment. The case highlights the importance of evaluating medication exposure alongside other potential contributors to hyponatremia.

## Case Presentation

A 47-year-old Afghan woman with major depressive disorder and generalized anxiety disorder presented with confusion and reduced consciousness approximately one month after starting bupropion. The patient was treated at King Abdullah Medical City, Makkah, Saudi Arabia. Her medical history included cervical meningioma resection approximately 17 years earlier, with subsequent quadriplegia and a longstanding tracheostomy. She also had a history of right breast cancer treated with modified radical mastectomy and systemic anticancer therapy, which had been complicated by poor tolerability and acute respiratory distress syndrome.

**How to cite this article**
Albarakati B A, Almwled A S, Alharthi A S (November 12, 2026) Bupropion-Associated Hyponatremia: A Case Report and a Review of the Literature. Cureus 18(11): e119555. DOI 10.7759/cureus.119555

Her depressive and anxiety symptoms predated her cancer diagnosis and worsened during subsequent medical treatment. She had received escitalopram for several years, with the dose previously titrated to 15 mg daily. There was no reported history of smoking, alcohol use, or other substance use.

During an earlier admission, she presented with confusion and hyponatremia, which was clinically considered hypovolemic. Escitalopram was discontinued as a possible contributor despite her previous long-term exposure. Approximately two months after discharge, her family restarted escitalopram at 5 mg daily. After two days of re-exposure, she was readmitted with severe hyponatremia, a serum sodium concentration of 102 mmol/L, and a Glasgow Coma Scale score of 7, indicating markedly impaired consciousness [12]. She required intensive care admission and serial sodium measurements. Her serum sodium concentration was 128 mmol/L at discharge.

Escitalopram was subsequently replaced with mirtazapine 15 mg nightly. She received mirtazapine for approximately two months and reported some improvement in depressive symptoms, but constipation and urinary retention limited tolerability. Mirtazapine was therefore replaced with bupropion 150 mg daily.

Approximately one month after starting bupropion, her family brought her to the emergency department because of confusion and reduced consciousness. She experienced one seizure in the emergency department, which terminated after administration of midazolam 2 mg. During the subsequent examination, she was conscious but disoriented to time, place, and person.

Investigations demonstrated a serum sodium concentration of 108 mmol/L and serum osmolality of 238 mOsm/kg, consistent with hypotonic hyponatremia. Thyroid-stimulating hormone was 0.430 mIU/L. Recorded serum creatinine concentrations ranged from 0.18 to 0.22 mg/dL. Blood urea nitrogen was <5 mg/dL on three measurements and 5 mg/dL on a subsequent measurement. Hypocalcemia and hypomagnesemia were also reported. Urinalysis was negative, and chest radiography showed no interval change. Her listed medications at presentation were bupropion, a proton-pump inhibitor, enoxaparin, and calcium carbonate.

Initial management included 500 mL of 0.9% sodium chloride and 100 mL of 3% sodium chloride. Serum sodium was monitored every eight hours. The admitting team considered hypovolemic versus euvolemic hyponatremia, with bupropion identified as a possible contributing medication. Bupropion was discontinued.

The psychiatry team assessed the presentation as hypoactive delirium in the setting of hyponatremia and recommended withholding psychotropic medications during acute medical stabilization. Documented serum sodium concentrations during treatment included 131 and 126 mmol/L. Over the following days, her confusion resolved and she became able to participate in a psychiatric interview. Serum sodium was 132 mmol/L at that assessment. Serum sodium measurements are summarized in Table *1*; the general adult reference range is 135-145 mmol/L [13].

| Clinical stage | Serum sodium (mmol/L) |
|---|---|
| At presentation | 108 |
| During inpatient treatment | 131 |
| During inpatient treatment | 126 |
| Psychiatric reassessment after resolution of confusion | 132 |

**TABLE 1: Selected serum sodium measurements during the current episode.**

General adult serum sodium reference range: 135–145 mmol/L [13]. Measurements are grouped by clinical stage.

Persistent depressive symptoms, including suicidal ideation, were elicited after her confusion resolved. Mirtazapine was restarted at 7.5 mg daily, with mild improvement in depressive symptoms reported. Antidepressant therapy and acute treatment are summarized in Table *2*.

| Medication or treatment | Dose | Reported clinical effect |
|---|---|---|
| Escitalopram: initial treatment | Previously titrated to 15 mg daily | Discontinued as a possible contributor to an earlier episode of hyponatremia |
| Escitalopram: re-exposure | 5 mg daily | Severe hyponatremia after two days of re-exposure; serum sodium was 102 mmol/L |
| Mirtazapine: initial treatment | 15 mg nightly | Some improvement in depressive symptoms; constipation and urinary retention limited tolerability |
| Bupropion | 150 mg daily | Severe symptomatic hyponatremia approximately one month after initiation; discontinued as a possible contributor |
| Midazolam | 2 mg | Seizure terminated after administration |
| Sodium chloride, 0.9% | 500 mL initially | Administered during acute management of hyponatremia |
| Sodium chloride, 3% | 100 mL initially | Administered during acute management of hyponatremia |
| Mirtazapine: reintroduction | 7.5 mg daily | Mild improvement in depressive symptoms |

**TABLE 2: Antidepressant therapy, acute treatment, and reported clinical effects.**

The reported outcomes reflect the clinical course during treatment and do not establish the individual causal effect of each medication.

## Discussion

This case describes severe symptomatic hypotonic hyponatremia occurring approximately one month after bupropion initiation in a patient with previous episodes of hyponatremia during escitalopram treatment. The temporal relationship and improvement following bupropion withdrawal and medical treatment support a possible medication-associated event. However, improvement occurred alongside active correction of the electrolyte disturbance and does not establish bupropion as the sole cause.

Several features of this patient are relevant to risk assessment. Female sex, low body mass index, severe physical illness, and a previous history of hyponatremia have been reported as risk factors for antidepressant-associated hyponatremia [5]. Our patient was female and had substantial medical comorbidity and previous severe hyponatremia. Her earlier episode following escitalopram re-exposure was particularly concerning for susceptibility to recurrent hyponatremia.

Published case reports provide additional evidence of a possible association between bupropion exposure and hyponatremia. Bagley and Yaeger described a case in which the association was supported by recurrence on rechallenge [14]. Kim et al. reported severe hyponatremia in a 60-year-old man after bupropion was introduced into an existing antidepressant regimen [15]. Kate et al. described a 75-year-old man whose hyponatremia improved after bupropion discontinuation [16]. Wiggins et al. reported hyponatremia and confusion in a 70-year-old woman after bupropion was added to dothiepin and escitalopram; the authors considered a medication interaction a likely explanation [17]. Munjal and Smolin described a 72-year-old woman who developed confusion, lethargy, and worsening hyponatremia during bupropion treatment, with improvement after its withdrawal [11]. These reports support clinical vigilance but do not establish incidence.

The mechanism of hyponatremia during bupropion treatment remains uncertain. Noradrenergic stimulation of vasopressin release has been proposed as a possible explanation [11]. A diagnosis of the syndrome of inappropriate antidiuretic hormone secretion (SIADH) requires an appropriate clinical and biochemical assessment, including evaluation of volume status, urine studies, and relevant alternative causes [2]. The low serum osmolality in this case confirmed hypotonic hyponatremia; it does not by itself establish SIADH.

Severe hyponatremia can produce confusion, impaired consciousness, and seizures [2]. In this patient, concurrent hypocalcemia and hypomagnesemia were additional potential contributors. Bupropion, used for major depressive disorder, also has a dose-related seizure risk, which may be increased by hyponatremia. Important contraindications include seizure disorders; current or previous anorexia nervosa or bulimia; abrupt discontinuation of alcohol, benzodiazepines, barbiturates, or antiepileptic drugs; and concomitant monoamine oxidase inhibitor use [18].

Clinically, a previous episode of antidepressant-associated hyponatremia warrants attention when selecting and monitoring subsequent treatment. Baseline sodium measurement and early reassessment after starting or changing an antidepressant are reasonable considerations in susceptible patients, alongside prompt electrolyte assessment if confusion, lethargy, or other neurological symptoms develop [5,11,17]. Such symptoms also warrant assessment in patients without a previous history of hyponatremia.

Mirtazapine may be considered in selected patients because its reported risk appears lower than that of some serotonergic antidepressants, but it is not free of hyponatremia risk [4]. It is a tetracyclic antidepressant used for major depressive disorder, with antagonistic activity at presynaptic α2-adrenergic and serotonin 5-HT2 and 5-HT3 receptors. Relevant adverse effects include somnolence, increased appetite, weight gain, and constipation; concomitant monoamine oxidase inhibitor use is contraindicated [19]. In the present case, its reintroduction also required consideration of previously reported constipation and urinary retention.

Further research is needed to clarify the underlying mechanisms and identify patients most susceptible to this adverse reaction. Prospective cohort studies with baseline and follow-up sodium measurements could help characterize the risk associated with bupropion and compare it with that of other antidepressants.

## Conclusions

This case and literature review highlight bupropion as a potential contributor to severe symptomatic hyponatremia, particularly in patients with previous antidepressant-associated hyponatremia and multiple medical comorbidities. Although the temporal relationship suggests an association, concurrent clinical factors prevent definitive attribution to bupropion alone. Careful assessment of susceptibility factors and serum sodium monitoring should be considered when initiating bupropion in patients at increased risk. Prompt recognition, withdrawal of the suspected medication, and appropriate correction of the electrolyte disturbance are important for recovery.

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Baraa A. Albarakati

**Acquisition, analysis, or interpretation of data:** Baraa A. Albarakati, Amani S. Almwled, Alhanouf S. Alharthi

**Drafting of the manuscript:** Baraa A. Albarakati

**Critical review of the manuscript for important intellectual content:** Baraa A. Albarakati, Amani S. Almwled, Alhanouf S. Alharthi

**Supervision:** Amani S. Almwled

### Disclosures

**Human subjects:** Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

## References

1. Upadhyay A, Jaber BL, Madias NE: Incidence and prevalence of hyponatremia . Am J Med. 2006, 119:S30-5. 10.1016/j.amjmed.2006.05.005
2. Verbalis JG, Goldsmith SR, Greenberg A, Korzelius C, Schrier RW, Sterns RH, Thompson CJ: Diagnosis, evaluation, and treatment of hyponatremia: expert panel recommendations. Am J Med. 2013, 126:S1-42. 10.1016/j.amjmed.2013.07.006
3. Corona G, Giuliani C, Parenti G, et al.: Moderate hyponatremia is associated with increased risk of mortality: evidence from a meta-analysis. PLoS One. 2013, 8:e80451. 10.1371/journal.pone.0080451
4. De Picker L, Van Den Eede F, Dumont G, Moorkens G, Sabbe BG: Antidepressants and the risk of hyponatremia: a class-by-class review of literature. Psychosomatics. 2014, 55:536-47. 10.1016/j.psym.2014.01.010
5. Egger C, Muehlbacher M, Nickel M, Geretsegger C, Stuppaeck C: A review on hyponatremia associated with

SSRIs, reboxetine and venlafaxine. Int J Psychiatry Clin Pract. 2006, 10:17-26. 10.1080/13651500500410216
6. Letmaier M, Painold A, Holl AK, et al.: Hyponatraemia during psychopharmacological treatment: results of a drug surveillance programme. Int J Neuropsychopharmacol. 2012, 15:739-48. 10.1017/S1461145711001192
7. Movig KL, Leufkens HG, Lenderink AW, Egberts AC: Serotonergic antidepressants associated with an increased risk for hyponatraemia in the elderly. Eur J Clin Pharmacol. 2002, 58:143-8. 10.1007/s00228-002-0438-5
8. Movig KL, Leufkens HG, Lenderink AW, van den Akker VG, Hodiamont PP, Goldschmidt HM, Egberts AC: Association between antidepressant drug use and hyponatraemia: a case-control study . Br J Clin Pharmacol. 2002, 53:363-9. 10.1046/j.1365-2125.2002.01550.x
9. Raj R, Jacob A, Venkatanarayan A, Doraiswamy M, Ashok M: Severe symptomatic hyponatremia secondary to escitalopram-induced SIADH: a case report with literature review. Case Rep Nephrol. 2018, 2018:3697120. 10.1155/2018/3697120
10. O'Sullivan D, Oyebode F: Hyponatraemia and lofepramine. Br J Psychiatry. 1987, 150:720-1. 10.1192/bjp.150.5.720b
11. Munjal S, Smolin Y: Bupropion induced hyponatremia in an elderly patient: a case report and review of the literature. Case Rep Psychiatry. 2016, 2016:5103471. 10.1155/2016/5103471
12. Teasdale G, Jennett B: Assessment of coma and impaired consciousness. A practical scale . Lancet. 1974, 2:81-4. 10.1016/s0140-6736(74)91639-0
13. MedlinePlus. Sodium blood test. (2026). Accessed: October 27, 2026: https://medlineplus.gov/ency/article/003481.htm.
14. Bagley SC, Yaeger D: Hyponatremia associated with bupropion, a case verified by rechallenge . J Clin Psychopharmacol. 2005, 25:98-9. 10.1097/01.jcp.0000150232.91995.22
15. Kim CS, Choi JS, Bae EH, Kim SW: Hyponatremia associated with bupropion. Electrolyte Blood Press. 2011, 9:23-6. 10.5049/EBP.2011.9.1.23
16. Kate N, Grover S, Kumar S, Modi M: Bupropion-induced hyponatremia. Gen Hosp Psychiatry. 2013, 35:681.e11-2. 10.1016/j.genhosppsych.2013.04.020
17. Wiggins A, Balasubramanian T, Ferraro A: Hyponatraemia and confusion in a 70-year-old female when bupropion was added to dothiepin and escitalopram. Australas Psychiatry. 2015, 23:507-9. 10.1177/1039856215597534
18. DailyMed: Wellbutrin XL—bupropion hydrochloride tablet, extended release. (2026). Accessed: October 27, 2026: https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm.
19. DailyMed: Mirtazapine tablet, film coated. (2026). Accessed: October 27, 2026: https://dailymed.nlm.nih.gov/dailymed/lookup.cfm.