fortune Journals

Research Article

ARCHIVES OF CLINICAL AND MEDICAL CASE REPORTS

ISSN: 2575-9655

Transfusion-dependence Anemia in a Middle-Age Woman under long-lasting therapy with Eslicarbazepine and Quetiapine: A Case Report and Drug-related Erythroid Toxicity review

Paula Gili Herreros[1], Juan José Gil-Fernández[1,2*], Francisco José de Abajo Iglesias[3], Julio García-Suárez[1,2]

Abstract

Antiepileptic and antipsychotic drugs are related with the development of different hematological toxicities both in short and long-term therapies. We present a case report of a patient with secondary structural focal epilepsy and behavioral disorder under prolonged therapy with eslicarbazepine and quetiapine who developed a 3-year long-lasting severe and recurrent hyporegenerative transfusion-dependent anemia. Recombinant-human erythropoietin and corticosteroids were successfully used in each relapse of severe anemia. Eslicarbazepine was first gradually replaced by lacosamide with hematological improvement and after a new relapse quetiapine was also replaced by paliperidone. After complete discontinuation of both eslicarbazepine and quetiapine a 1-year lasting therapy-free sustained hematologic recovery has been achieved without further relapses. This is the first case in the literature to directly associate eslicarbazepine, as previously carbamazepine, with erythroid toxicity and also points to quetiapine for central hematological toxicity. Our clinical observation underscores the importance of considering drugs as a possible cause of anemia in patients under prolonged antiepileptic and antipsychotic therapies especially in combination regimens.

Keywords: Transfusion; Erythroid toxicity; Eslicarbazepine; Quetiapine; Antiepileptics.

Introduction

Antiepileptic drugs (AEDs) are essential for controlling seizures in patients with epilepsy. In prolonged AED therapies, anemia can appear as an adverse effect with a prevalence ranging from 2% to 25%. The most commonly associated drugs with anemia include sodium valproate, carbamazepine and phenytoin [1]. We present the case of a 47-year-old patient with psychomotor retardation and focal epilepsy of structural etiology, undergoing long-term treatment with two AEDs (eslicarbazepine and brivaracetam). She was referred to the Hematology department for investigation of severe hyporegenerative anemia requiring multiple red blood cell transfusions (RBC).

Materials and Methods

This is a case study with follow-up in the Hematology department from July 2022 to May 2025. A systematic literature review was conducted of observational studies, clinical trials, and case reports of anemia related to AEDs. Medical databases such as PubMed, Scopus, and Medline were utilized, using the following key words: “anemia”, “eslicarbazepine”, “quetiapine”, “antiepileptics”, “eosinophilia”.

Affiliation:
[1]Hematology Department, Príncipe de Asturias University Hospital, Alcalá de Henares, Madrid, Spain

[2]School of Medicine, Alcalá de Henares University, Madrid, Spain

[3]Pharmacology Unit, Biomedical Sciences Department, School of Medicine, Alcalá de Henares University, Madrid, Spain

***Corresponding Author**
Juan José Gil-Fernández, Hematology Department, Hospital Universitario Principe de Asturias, Alcalá de Henares, Madrid, Spain

Citation: Paula Gili Herreros, Juan José Gil-Fernández, Francisco José de Abajo Iglesias, Julio García-Suárez. Transfusion-dependence Anemia in a Middle-Age Woman under long-lasting therapy with Eslicarbazepine and Quetiapine: A Case Report and Drug-related Erythroid Toxicity review. Archives of Clinical and Medical Case Reports. 10 (2026): 11-15.

Received: December 22, 2025
Accepted: January 03, 2026
Published: January 22, 2026

Herreros PG, et al., Arch Clin Med Case Rep 2026
DOI:10.26502/acmcr.96550743

Case Report

The patient is a 47-year-old female with focal epilepsy secondary to meningitis at infancy with bifrontal and temporal residual damages with psychomotor retardation and behavioral disorder receiving long-lasting treatment with eslicarbazepine (800 mg daily, since april 2012), quetiapine (200 mg daily, since December 2011) and Brivaracetam (50 mg daily, since February 2017). She was admitted to the Internal Medicine department in May 2022 for severe hyporegenerative anemia with hemoglobin (HB) level of 6.8 g/dl following a SARS-CoV-2 infection, requiring red blood cell (RBC) transfusions. At that time, anemia was considered as a consequence of a chronic inflammation associated with COVID-19 disease. Two months later, she was readmitted with a profound isolated sympthomatic anemia with a HB level of 3.6 g/dl and reticulocytes <10.000/mm^3 with the rest of hematological parameters within normal range. This prompted a consultation with the Hematology Department. A complete digestive and hematological study was conducted without relevant findings (Table 1). Recombinant Human (rH)-Epoetin-Alfa (Binocrit-R) 40.000 UI, subcutaneously (SC) weekly, later increased to 60.000 UI and biweekly transfusions were started with progressive improve of HB level up to 10.5 gr/dl, then with a slowly tapering of rH-Epoetin-Alfa.In September 2022, a slight decrease of HB level to 9 g/dl with marked reticulocytopenia < 10.000/mm3 was observed and dexamethasone 20 mg weekly was initiated, with subsequent tapering and full recovery reaching an HB level of 13.7 gr/dl. In May 2023, a second major drop of HB level to 6 g/dl occurred accompanied by reticulocytopenia and moderate eosinophilia of 1.38 x10e9/l. RBC transfusions were required together with restarting rH-Epoetin-Alfa at high doses of 60.000 UI SC weekly and prednisone 30 mg daily with fast resolution of eosinophilia, full recovery of reticulocytes and progressive recovery of anemia reaching an HB level of 13.9 gr/dl on 09/01/2023 (Figure1). In the context of the diagnostic workup for unexplained hyporegenerative anemia, a late-onset immune-mediated erythroid toxicity of the bone marrow secondary to eslicarbazepine was suspected. Consequently, we recommended that the neurologist consider substituting eslicarbazepine with an alternative antiepileptic agent. Eslicarbazepine was then progressively discontinued from 08/02/2023 until full suspension on 09/30/2023 and replaced by lacosamide (from 50 mg twice daily until final dose of 150 mg twice daily), leading to full recovery of HB and reticulocytes which allowed us to progressively discontinue both rH-Epoetin-Alfa and prednisone. Nonetheless, 4 months after eslicarbazepine discontinuation (in January 2024), a new anemic episode occurred with an HB level of 5.2 g/dl with eosinophilia of 0.52 x10e9/l. Then, RBC transfusions were resumed with rH-Epoetin-Alfa at high doses of 60.000 UI SC weekly and prednisone 30 mg leading to a fast recovery of HB until 14.0 gr/dl on 05/08/2024. After that a with gradual withdrawal of rH-Epoetin-Alfa and prednisone. A final anemic episode occurred in July 2024, with a HB level of 6.5 g/dl and reticulocytopenia, prompting another round of treatment with rH-Epoetin-Alfa at high doses of 60.000 UI SC weekly and prednisone 30 mg. At this point we asked the Psychiatry department to discontinue quetiapine treatment, given its possible contribution to anemia and quetiapine was completely discontinued on 8/11/2024 and Paliperidone was started on 09/05/2024 from 3 mg daily until a final dose of 12 mg daily. The HB levels have maintained stable between 13.9 and 14.4 gr/dl without needing of further therapy in the last 10 months after complete discontinuation of both eslicarbazepine and quetiapine (Figure1).

Table 1: Complementary studies at the beginning of follow-up.

Complementary studies			Result
Complete blood count	Hb (g/dL)*		3.6
	Abs Reticulocytes (x10^3/µl)*		1000
	Platelets (x10^3/µl)*		430
	Leukocytes (x10^3/µl)*		4.8
	PB smear		Hypochromatic red series with moderate anisocytosis. No blasts. No dysplasia
Complete biochemistry	Hemolytic parameters	LDH (U/l)	119
		Total bilirubin (mg/dl)	0.41
	Autoimmunity (ANA, ENA, AntiDNA)		Negative
	Serologies (HBV, HCV, HIV, B19 parvovirus, EVB, CMV)		Negative

Citation: Paula Gili Herreros, Juan José Gil-Fernández, Francisco José de Abajo Iglesias, Julio García-Suárez. Transfusion-dependence Anemia in a Middle-Age Woman under long-lasting therapy with Eslicarbazepine and Quetiapine: A Case Report and Drug-related Erythroid Toxicity review. Archives of Clinical and Medical Case Reports. 10 (2026): 11-15.

Herreros PG, et al., Arch Clin Med Case Rep 2026
DOI:10.26502/acmcr.96550743

Bone marrow studies	Aspirate	Hyperplastic bone marrow, with relative erythroid hypoplasia without clear dysplastic data
	Biopsy	Hypercellular marrow, with a predominance of immature forms of the erythroid series with little component of mature elements
	Myeloid panel by NGS o BM cells	No myeloid pathologic mutations detected
NGS congenital anemias		No mutations detected
Karyotype PB		Normal female karyotype (46XX)
CT body		Subcentimeter mediastinal, bilateral hilar, and retroperitoneal lymphadenopathy. Pseudonodular thickening of the gastric walls, to be assessed with gastroscopy
Gastrocolonoscopy		Gastric polyps, possible chronic gastritis and intestinal lymphangiectasia

Hb: hemoglobin. Abs: absolute. PB: peripheral blood. BM: bone marrow. NGS: next-generation sequencing. CT: computed tomography.
*Normal reference values: Hb (g/dL): 12-16. Abs Reticulocytes (x10³/µl): 22-132. Platelets (x10³/µl): 150-400. Leukocytes (x10³/µl): 4.5-11.

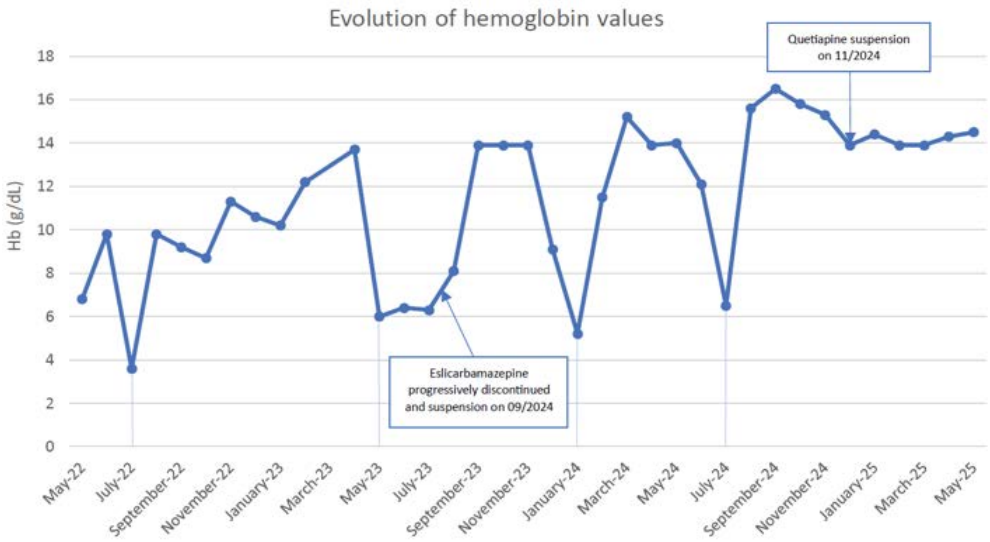

Figure 1: Evolution of hemoglobin values.

Discussion

Our case describes a severe hyporegenerative anemia likely associated with prolonged use of eslicarbazepine, an unusual finding that has not been previously reported in the literature. Eslicarbazepine, a voltage-gated sodium channel blocker (VGSC), shares structural similarities with carbamazepine and oxcarbazepine but differs in its metabolism, avoiding the formation of toxic epoxides like CBZ-10,11-epoxide [2, 3]. Pharmacological and clinical studies have highlighted the favorable profile of eslicarbazepine in terms of neurological tolerability and common side effects (drowsiness, dizziness, nausea), with no significant reports of hematologic toxicity in clinical trials or patient series (2). However, its structural similarity to carbamazepine warrants consideration of shared pathogenic mechanisms. Carbamazepine has previously been implicated in cases of severe erythroid suppression, both via immune-mediated mechanisms and direct marrow toxicity after long-term therapies [4].

In the current clinical case, a temporal pattern consistent with immune-mediated toxicity is observed, marked by reticulocytopenia, eosinophilia, and a favorable response to corticosteroids and drug discontinuation. This pattern is reminiscent of the "erythroid sequestration or erythroid arrest" phenomenon induced by carbamazepine, a rare but well-documented event characterized by selective inhibition of bone-marrow erythropoiesis in the absence of pancytopenia [4, 5]. Given that eslicarbazepine is not metabolized to reactive epoxide compounds like its analogue CBZ, the observed hematologic toxicity may be attributed to an idiosyncratic immune-allergic mechanism rather than

direct toxicity, which aligns with the clinical evolution of the case [1]. The absence of other identifiable causes in the hematological studies, the response to immunosuppression and recovery after drug withdrawal support this hypothesis. Our case underscores the need to expand pharmacovigilance for eslicarbazepine, particularly in patients on prolonged treatments with comorbidities, as well as to consider its potential erythroid-suppressive effect when unexplained anemias occur during treatment.

Quetiapine is an atypical antipsychotic drug and its dibenzothiazepine structure has dopamine-2 (D2) receptor antagonism just like any other antipsychotic-active drugs. Quetiapine shows structural similarities to clozapine and olanzapine, that are typical antipsychotics drugs with well-known hematological side effects with cases of pancytopenia related with clozapine, quetiapine and risperidone reported in the literature. There are also case reports that suggest development of agranulocytosis, leucopenia, neutropenia, thrombocytopenia and thrombotic thrombocytopenic purpura associated with quetiapine [6-11]. Most of hematological side effects caused by psychotropic drugs were explained by different pathophysiological mechanism such as active or toxic metabolite formation, bone-marrow suppression or bone-marrow cells destruction by immune cells [12, 13]. Psychotropic drugs including atypical antipsychotics as quetiapine affect mostly to platelets and leucocytes. On the contrary, the isolated effect of quetiapine over erythrocytes is most limited with a case of quetiapine-induced autoimmune hemolytic anemia in a pediatric patient [14] and in our knowledge, there are no case reports in literature relating quetiapine with isolated bone-marrow erythroid toxicity. Quetiapine has also been associated with peripheral-blood eosinophilia [15] among other medications (allopurinol, vancomycin, lamotrigine, carbamazepine, trimethroprim-sulfamethoxazole) or viral reactivation (e.g. HHV-6, CMV, EBV) implicated in Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) as recently comprehensive revised by Kroshinsky D et al.[16].

Thus, a drug-induced immune-mediated toxicity related to quetiapine is considered a possible mechanism. The presence of eosinophilia supports this hypothesis, suggesting an immunological involvement (possibly mediated by a Th2-type response with generation of interleukine 5) in the suppression of erythropoiesis. The presence of numerous erythroblasts in the bone marrow examination, combined with the improvement of the anemia following steroid administration, suggests an immunological mechanism contributing to the pathophysiology of the anemia. Furthermore, two episodes of anemia occurred even after the discontinuation of eslicarbazepine and when considering the overall clinical course, it remains entirely possible that Quetiapine alone was responsible for the anemia.

Conclusion

To the best of our knowledge, this is the first case of severe transfusion-dependent anemia associated with eslicarbazepine and also relates quetiapine with isolated bone-marrow erythroid toxicity. Nevertheless, anemia is a common complication in patients treated with antiepileptics, especially in those undergoing long-term and combined therapies of antiepileptic and antipsychotic drugs. This case highlights the importance of monitoring the hematological side effects of antiepileptic and antipsychotic drugs in long-term treatments.

Contributions to the Work

Paula Gili Herreros: formal analysis, research, methodology, validation, writing, review, and editing.

Juan José Gil Fernández: formal analysis, research, methodology, validation, writing, review, and editing.

Francisco José de Abajo Iglesias: validation, writing, review, and editing.

Julio García-Suárez: validation, writing, review, and editing.

Acknowledgments

All authors are active members of the Spanish Society of Hematology (SEHH).

Funding

This work was supported by the Wiley agreement with the University of Alcalá.

Conflict of Interest

Juan José Gil Fernández: fees from Johnson & Johnson, Bristol Myers Squibb, GlaxoSmithKline, Sanofi, and Amgen.

Paula Gili Herreros, Francisco José de Abajo Iglesias, and Julio García Suárez have no relevant financial relationships to disclose.

Data Availability Statement

The data sets used in this study are available on reasonable request to the corresponding author. Access to the data requires prior approval in accordance with institutional and ethical guidelines.

Ethical Statement

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Human Ethics and Consent to Participate: All patient data were anonymized prior to analysis to ensure privacy and confidentiality. This descriptive study did not involve any direct intervention

orinteraction with the patient. In accordance with applicable regulations, ethical approval and informed consent were not required.

References

1. Padda J, Khalid K, Syam M, et al. Association of Anemia With Epilepsy and Antiepileptic Drugs. Cureus 13 (2021): 19334.
2. Almwith L, Soares-da-Silva P. Eslicarbazepine acetate (BIA 2-093). Neurotherapeutics (2004): 88-96.
3. Asconapé JJ. Some common issues in the use of antiepileptic drugs. Semin Neurol 22 (2002): 247-256.
4. Medberry CA III, Pappas AA, Ackerman BH. Carbamazepine and erythroid arrest. Drug Intell Clin Pharm 21 (1987): 439-441.
5. Shander A, Javidroozi M, Ashton ME. Drug-induced anemia and other red cell disorders: a guide in the age of polypharmacy. Curr Clin Pharmacol 6 (2011): 295-303.
6. Iraqui A. A case report of pancytopenia with quetiapine use. Am J Geriatr Psychiatry 11 (2003): 694.
7. Huynh M, Chee K, Lau DH. Thrombotic thrombocytopenic purpura associated with quetiapine. Ann Pharmacother 39 (2005): 1346-1348.
8. Mathews M, Muzina DJ. Atypical antipsychotics: new drugs, new challenges. Cleve Clin J Med 74 (2007): 597-606.
9. Ruhé HG, Becker HE, Jessurun P, et al. Agranulocytosis and granulocytopenia associated with quetiapine. Acta Psychiatr Scand 104 (2001): 311-314.
10. Cowan C, Oakley C. Leukopenia and neutropenia induced by quetiapine. Prog Neuropsychopharmacol Biol Psychiatry 31 (2007): 292-294.
11. Arslan FC, Aykut DS, Ince C, et al. Neutropenia and thrombocytopenia induced by quetiapine monotherapy: a case report and review of literature. Bull Clin Psychopharmacol 26 (2016): 319-323.
12. Erdogan S. Hematological side effects of atypical antipsychotic drugs. Curr Approach Psychiatry 1 (2009): 255-279.
13. Flanagan RJ, Dunk L. Haematological toxicity of drugs used in psychiatry. Hum Psychopharmacol 23 (2008): 27-41.
14. Asiye Arici, Hatice Altun, Can Acipayam. Quetiapine Induced Autoimmune Hemolytic Anemia in a Child Patient: A Case Report. Clin Psychopharmacology and Neurosci 16 (2018): 501-504.
15. Liming Chen, Pei Tan, Xiaolin Tan. Case report of eosinophilia induced by quetiapine. Shanghai Arch Psychiatry 27 (2015): 374-377.
16. Kroshinsky D, Cardones ARG, Blumenth KG. Drug Reaction with Eosinophilia and Systemic Symptoms. N Engl J Med 391 (2024): 2242-2254.

Citation: Paula Gili Herreros, Juan José Gil-Fernández, Francisco José de Abajo Iglesias, Julio García-Suárez. Transfusion-dependence Anemia in a Middle-Age Woman under long-lasting therapy with Eslicarbazepine and Quetiapine: A Case Report and Drug-related Erythroid Toxicity review. Archives of Clinical and Medical Case Reports. 10 (2026): 11-15.