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Lamotrigine-Induced Neutropenia in a Woman With Seizure Disorder

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Abstract-Lamotrigine is an anticonvulsant medication belonging to the phenyltriazine class that modulates calcium and potassium channels and inhibits voltage-sensitive sodium channels. Additionally, lamotrigine inhibits dihydrofolate reductase. The U.S. Food and Drug Administration has approved the medication for the maintenance treatment of bipolar type I disease and seizure disorder. Various case reports has reported hematologic adverse effects with lamotrigine therapy.[1–8] Here we have described a 24-year-old seizure disorder patient who developed neutropenia while on lamotrigine.

Case Report

Mrs A, a 24-year-old Indian woman presented to Medicine Department at SMS Medical Coolege Jaipur with fever for last 5 days. Fever was high grade (102-103°F) , associated with chills , continuous , decreased on taking Tab PCM , with no diurnal variations associated with generalized weakness and bodyache . Fever was not associated with cough, cold, sore throat, pain abdomen , diarrhea , vomiting, yellowish discoloration of eyes, burning micturition , decreased urine output, neck pain , altered behavior , focal neurological deficit , headache , blurring of vision / double vision / deviation of angle of mouth. There was no history of chest pain , shortness of breath/ palpitations, recurrent oral ulcers , photosensitivity , swollen joints, significant weight loss, and unusual vaginal discharge , local itching or irritation.

The past history revealed that the patient has adult onset seizure disorder and is taking Lamotriginand Clobazam from last 15 days. Systemic examination and clinical examination was normal except that fever was noted in examination.

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The blood test results showed revealed anaemia and progressive leucopenia and neutropenia (white blood cell count was 3000/mm³ on first day, 2200/mm³ on second day and , 1000/mm³ on third day . The ANC was 1342/mm³ on first day, 1170/mm³ on second day and, 300/mm³ on third day). The haemoglobin was 8.2 gm/dl. The fever profile was negative for dengue, Widal and Chikungunya . USG whole abdomen revealed no abnormality except mild splenomegaly.Blood culture was sterile. CECT chest, abdomen and head revealed no abnormality. Autoimmune and Thyroid profile was negative. Bone marrow aspirate revealed small islands of haematopoiesis showing normoblastic erythroid hyperplasia and presence of abundant megakaryocytes however, myeloid series is markedly suppressed S/o Agranulocytosis. Bone marrow aspirate CS revealed Acinetobacter species sensitive to imipenem, and colistin. Urine CS revealed Enterococcus species 100000 CFU/ml which was sensitive to ampicillin, tetracycline, vancomycin, linezolid. In view of continuous fever and neutropenia all viral panel was sent which also came negative.

In view of continuous fever and neutropenia inj Filgrastin was added (for 7 days) and considering diagnosis of drug induced febrile neutropenia Lamotrigine was stopped and Levetiracetam was started in replacement. Patient was taken on Artesunate,Meropenem, Linezolid and Caspofungin.

After 2 days clinical and lab parameter started improving and fever subsided. After completing these treatments, his general appearance remained satisfactory and neutrophil counts remained within normal limits. He was discharged on the 7th day.

Discussion- Published reports of lamotrigine-induced neutropenia[1–4] and agranulocytosis[5–8] have demonstrated normalization of blood counts with drug discontinuation alone. In our case, there was a definite association between lamotrigine therapy and neutropenia. The brief normalization of blood counts following stopping lamotrigine was noted.

Although the mechanism of action of lamotrigine-induced hematologic abnormalities is unknown, a combination of immunoallergic, direct medullary toxicity, and granulopoiesis-inhibiting effects has been suggested.[1] There are also reports on lamotrigine-associated macrocytic anemia,[9] leukopenia,[10–12] and thrombocytopenia,[12] which suggest a common possible mechanism involving enzymatic inhibition of dihydrofolate reductase by lamotrigine. It is plausible that one or more of the above pathophysiologic mechanisms were

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involved in our patient. With the normalization of blood counts with discontinuation alone, we did not attempt a bone marrow aspiration.

Conclusion- Based on the clinical course, we concluded that the leukopenia and neutropenia are associated with lamotrigine. Monitoring of WBC should be kept in mind when administering lamotrigine.

References

1. Lambert O, Veyrac G, and Armand C. et al. Lamotrigine-induced neutropenia following two attempts to increase dosage above 50 mg/day with recovery between episodes. Adverse Drug React Toxicol Rev. 2002 21:157–159. [DOI] [PubMed] [Google Scholar]
2. Damiani JT, Christensen RC. Lamotrigine-associated neutropenia in a geriatric patient [letter] Am J Geriatr Psychiatry. 2000;8:346. [PubMed] [Google Scholar]
3. LeDrew K, Phillips L, and Hogan M. et al. Lamotrigine-induced neutropenia [letter]. Can J Psychiatry. 2005 50:242. [DOI] [PubMed] [Google Scholar]
4. Normann C, Hummel B, and Scharer LO. et al. Lamotrigine as adjunct to paroxetine in acute depression: a placebo-controlled, double-blind study. J Clin Psychiatry. 2002 63:337–344. [DOI] [PubMed] [Google Scholar]
5. Solvason HB. Agranulocytosis associated with lamotrigine [letter] Am J Psychiatry. 2000;157:1704. doi: 10.1176/appi.ajp.157.10.1704. [DOI] [PubMed] [Google Scholar]
6. Fernandez-Galan M, Martin-Nunez G, and Castellanos F. et al. Lamotrigine-induced agranulocytosis [letter]. Med Clin (Barc). 2000 115:759. [DOI] [PubMed] [Google Scholar]
7. de Camargo OA, Bode H.. Agranulocytosis associated with lamotrigine [letter] BMJ. 1999;318:1179. doi: 10.1136/bmj.318.7192.1179a. [DOI] [PMC free article] [PubMed] [Google Scholar]
8. Fadul CE, Meyer LP, and Jobst BC. et al. Agranulocytosis associated with lamotrigine in a patient with low-grade glioma [letter]. Epilepsia. 2002 43:199–200. [DOI] [PubMed] [Google Scholar]

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9. Cocito L, Maffini M, Loeb C. Long-term observations on the clinical use of lamotrigine as add-on drug in patients with epilepsy. Epilepsy Res. 1994;19:123–127. doi: 10.1016/0920-1211(94)90022-1. [DOI] [PubMed] [Google Scholar]

10. Kilbas S. Lamotrigine-induced leucopenia [letter] Epileptic Disord. 2006;8:317. [PubMed] [Google Scholar]

11. Nicholson RJ, Kelly KP, Grant IS. Leucopenia associated with lamotrigine [letter] BMJ. 1995;310:504. doi: 10.1136/bmj.310.6978.504b. [DOI] [PMC free article] [PubMed] [Google Scholar]

12. Ural AU, Avcu F, and Gokcil Z. et al. Leucopenia and thrombocytopenia possibly associated with lamotrigine use in a patient [letter]. Epileptic Disord. 2005 7:33–35