AJPR
Avicenna Journal of Pharmaceutical Research
Avicenna J Pharma Res. 2025;6(1):78-80
DOI: 10.53208/ajpr.6.1.78
http://ajpr.umsha.ac.ir



Case Report

Management of Chorea-Athetosis-Dystonia in a 67-Year-Old Male with Acute Myeloid Leukemia (AML) and Parkinson's Disease on Levodopa Therapy

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Article history:
Received: February 7, 2025
Revised: April 16, 2025
Accepted: July 21, 2025
Published: July 27, 2025

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Abstract

Background: Managing overlapping movement disorders in patients with hematologic malignancies is challenging, and levodopa-induced dyskinesias can complicate treatment of comorbid Parkinson's disease.

Methods: Case report of a 67-year-old man with newly diagnosed AML who developed chorea, athetosis, and dystonia while receiving levodopa for comorbid Parkinson's disease. Tetrabenazine was initiated for symptomatic control of the hyperkinetic movements.

Results: Tetrabenazine led to substantial clinical improvement in the hyperkinetic movements, with acceptable tolerability despite the potential dopaminergic interactions.

Conclusion: This case highlights the challenges of managing overlapping movement disorders in patients with hematologic malignancies and suggests that tetrabenazine may be a therapeutic option for levodopa-induced dyskinesias.

Keywords: Acute Myeloid Leukemia, Levodopa-Induced Dyskinesia, Parkinson's Disease, Tetrabenazine

Introduction

Acute Myeloid Leukemia (AML) is an aggressive hematologic malignancy primarily affecting older adults. Neurological complications in AML can arise from direct leukemic infiltration, paraneoplastic phenomena, treatment-related toxicities, or comorbidities. Parkinson's disease (PD), a common neurodegenerative disorder in older adults, is typically managed with levodopa, which can lead to motor fluctuations and dyskinesias (including chorea, athetosis, and dystonia) over time [1].

Tetrabenazine, a vesicular monoamine transporter 2 (VMAT2) inhibitor, depletes presynaptic dopamine and is approved for chorea associated with Huntington's disease. It has also been investigated for levodopa-induced dyskinesias (LIDs) in PD. Its use requires caution in patients receiving dopaminergic therapy due to potential worsening of parkinsonism [2].

Case Presentation

A 67-year-old male with a history of idiopathic Parkinson's disease (diagnosed 5 years earlier, Hoehn and Yahr stage 2.5) presented with fatigue, easy bruising, and pancytopenia. He was on stable levodopa/carbidopa therapy (a total daily dose equivalent of approximately 600–800 mg levodopa,

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[DOI: 10.53208/ajpr.6.1.78]

divided doses) with good control of motor symptoms but occasional mild peak-dose dyskinesias.

Bone marrow biopsy confirmed AML (intermediate-risk cytogenetics). Induction chemotherapy was initiated (e.g., standard "7+3" regimen with cytarabine and an anthracycline). During hospitalization, the patient developed new-onset prominent hyperkinetic movements: orofacial and limb chorea, athetoid writhing movements of the distal extremities, and intermittent dystonic posturing, predominantly affecting the neck and trunk. These movements were most pronounced during "on" periods coinciding with levodopa dosing and significantly impaired daily activities, feeding, and communication.

Neurological consultation considered the movements most consistent with levodopa-induced dyskinesias, potentially exacerbated by metabolic stress, electrolyte shifts, or AML-related factors. Brain magnetic resonance imaging (MRI) showed no acute leukemic infiltration or stroke. No newly introduced medications known to cause or exacerbate abnormal movements (e.g., antiemetics with dopamine-blocking properties) were identified. Reducing the levodopa dose did not improve his symptoms. Increasing the levodopa dosing frequency did not improve the dyskinesias and resulted in worsening rigidity and bradykinesia; therefore, the previous regimen was resumed.

Tetrabenazine was started at a low dose (12.5 mg once daily) and titrated gradually to 25 mg three times daily, with close monitoring of parkinsonian symptoms and mood. Within 1–2 weeks, there was a substantial reduction in choreiform and athetoid movements, estimated to be approximately 50%–70% based on serial neurological examinations and patient-reported improvements in feeding, communication, and activities of daily living. Dystonic features also lessened. Levodopa dosing was maintained with minor adjustments to avoid worsening "off" periods. The patient tolerated tetrabenazine well, with only mild transient somnolence and no clinically apparent exacerbation of parkinsonism or depressive symptoms.

A hematologic response to AML therapy was achieved, and the patient was discharged with plans for consolidation therapy. Follow-up outpatient monitoring continued for both oncology and neurology care.

Discussion

This case illustrates the complex interplay between neurodegenerative disease, dopaminergic therapy, and acute medical illness. Levodopa-induced dyskinesias are a well-recognized complication of long-term PD treatment, often manifesting as choreiform or choreoathetoid movements. In the setting of AML, additional factors such as systemic inflammation, anemia, and treatment-related factors may contribute to abnormal movements [3].

Tetrabenazine's mechanism—reversible VMAT2 inhibition leading to dopamine depletion—makes it effective for hyperkinetic disorders but necessitates careful titration in PD patients to balance dyskinesia control against worsening bradykinesia or rigidity. Literature supports its use in LIDs, with studies showing meaningful reduction in peak-dose dyskinesias. [4, 5]

Potential challenges include psychiatric side effects (depression, suicidality), sedation, and interactions with levodopa. In this patient, benefits outweighed risks with multidisciplinary oversight. Alternatives like amantadine, deutetrabenazine, or valbenazine could be considered for better tolerability profiles in future cases. [1]

Limitations of this report include its single-case nature and lack of objective quantification using a validated dyskinesia scale, such as the Abnormal Involuntary Movement Scale (AIMS) or Unified Dyskinesia Rating Scale (UDysRS), to quantify precision of treatment response assessment. Long-term outcomes in the context of ongoing AML therapy remain to be seen.

Conclusion

Tetrabenazine can be an effective adjunct for managing severe chorea-athetosis-dystonia in patients with PD on levodopa, even in the presence of concurrent AML. Close monitoring is essential. This case emphasizes the need for integrated neurologic and oncologic care in older patients with multiple comorbidities.

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