

Carbidopa/levodopa for the treatment of ataxia secondary to hypoxic-ischemic encephalopathy: A Case Report

Kavita Nadendla, MD¹, Anisa Tatini, MD¹, Alexander Shustorovich, DO¹, Nancy Yeh, MD²

¹Johns Hopkins School of Medicine, Department of Physical Medicine and Rehabilitation, Baltimore, Maryland

²Kennedy Krieger Institute, Baltimore, Maryland

Introduction

- Levodopa is considered the gold standard of treatment of Parkinson's disease.¹
- Generated motor symptoms of Parkinson's disease are associated with the loss of dopaminergic neurons in the basal ganglia.^{1,2}
- Studies have shown that hypoxic-ischemic events differentially affect the dopaminergic systems of the brain.³
- Pediatric leukoencephalopathies and hypoxic-ischemic encephalopathy (HIE) affecting the cerebellum and basal ganglia are characterized by ataxia and extrapyramidal movements.⁴
- From anecdotal reports, carbidopa/levodopa may be an effective treatment.^{5,6}

Case Description

- A 4-year-old adopted male with unknown medical and family history underwent elective ophthalmologic surgery for strabismus repair.
- He emerged agitated from anesthesia, thus additional fentanyl was administered.
- Six hours after surgery, his parents were unable to wake him. He was admitted to the PICU for end-organ dysfunction from suspected opioid intoxication.

- Head CT showed an atrophic right cerebellar hemisphere, representing a chronic, possibly perinatal, infarct. Brain MRI was consistent with acute/subacute HIE with basal ganglia involvement.

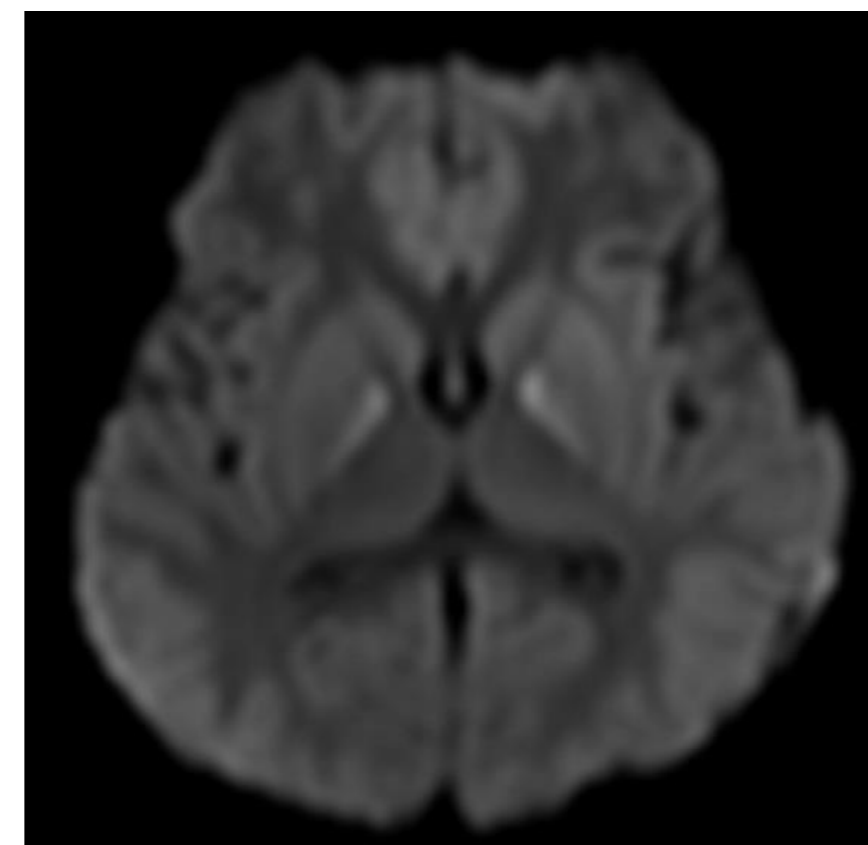


Fig 1. DWI demonstrates restricted diffusion in bilateral globus pallidi.

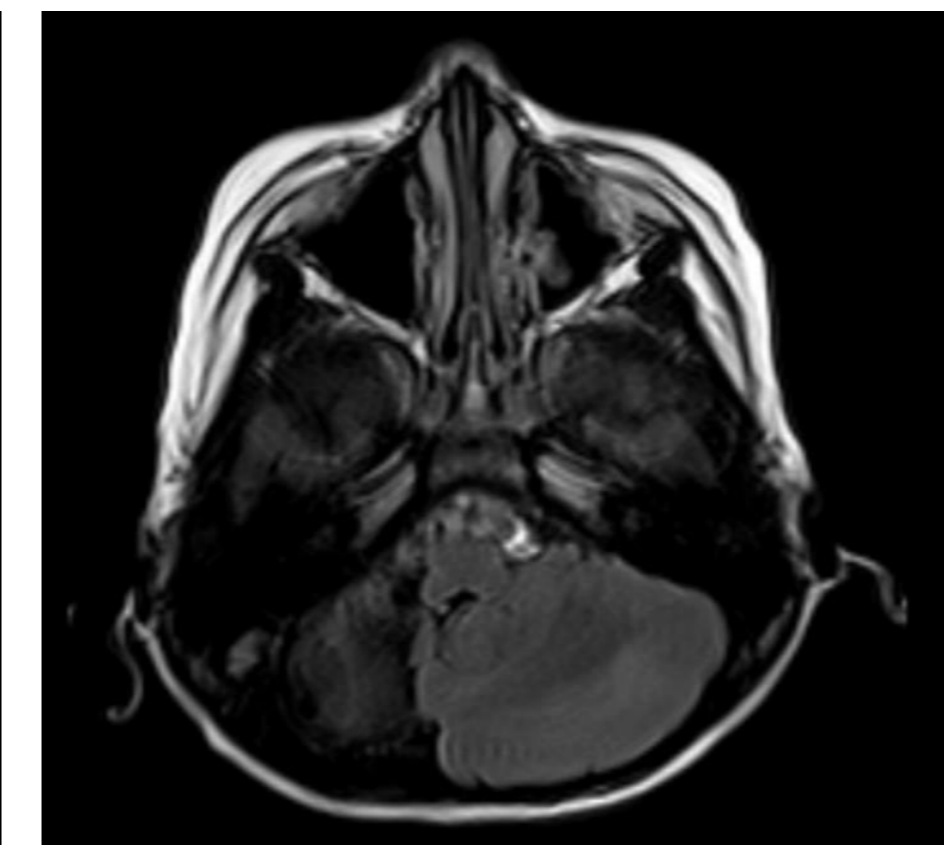


Fig 2. FLAIR shows atrophy of the right cerebellar hemisphere.

- Though his mental status and motor function improved significantly, he was admitted to acute inpatient pediatric rehabilitation for new truncal ataxia and coordination abnormalities.
- Upon reaching a presumed functional plateau, the child was started on carbidopa/levodopa, with subsequent improvement in gait pattern as evidenced by the WeeFIM outcome measure.

Discussion

- In this case, an ischemic event resulted in HIE affecting the cerebellum and basal ganglia.
- The most similar indication to HIE describing the use of carbidopa/levodopa for treatment is hypomyelination with atrophy of the basal ganglia and cerebellum (H-ABC).
- In H-ABC, carbidopa/levodopa has been used to aid in ambulation and hemi-dystonia.⁵
- In children with HIE with cerebellar and basal ganglia involvement, carbidopa/levodopa may be useful in improving ataxia and promoting functional gains.
- Further studies evaluating appropriate drug initiation, duration, and dosage are needed.

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