

Phenytoin Induced Cerebellar Atrophy-A Case Report

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ABSTRACT

Epilepsy is one of the common disorders encountered by a physician for which Phenytoin is routinely prescribed. Patients on Phenytoin might develop sedation, dizziness, swaying, rash and gum hypertrophy as drug related side effects.¹ Cerebellar Atrophy is infrequently reported complication of long term phenytoin toxicity. We report a case of 25year old male, who presented with complaints of giddiness and swaying while walking. He is a known epileptic and has been on Phenytoin for the past 14 years. On evaluation, MRI Brain revealed cerebellar atrophy and his serum phenytoin level was 32mcg/ml which was far above the recommended therapeutic level of 10-20 mcg/ml.¹ Thus, Cerebellar atrophy in this male is probably due to long term supra therapeutic levels of Phenytoin. Therefore, we recommend frequent therapeutic drug monitoring of Phenytoin.

Keys words: Epilepsy, Phenytoin, Cerebellar Atrophy.

Introduction

Phenytoin is one of the oldest and commonly used anti-epileptic drugs. It acts majorly by blocking the sodium channels and thus decreasing the generation of rapidly repetitive action potentials. It is useful in cases of both generalized tonic-clonic and partial seizures.^{2,3} Acute intoxication of Phenytoin leads to lethargy, giddiness, diplopia, dysarthria, ataxia etc. which are usually reversible after stopping the drug. Other side effects include lymphadenopathy, Steven-Jhonson's syndrome, Hirsutism, gum hypertrophy etc.

Case Report

A 25year old right handed male was brought to outpatient department with complaints of giddiness

and swaying while walking. These complaints existed for 4 months prior to reporting at the hospital. It was insidious in onset and gradually progressive. There was also a history of difficulty in reaching objects. Patient denied complaints of any limb weakness, speech / swallowing difficulties, numbness/tingling sensations or fever. He is a known epileptic and has been on oral Phenytoin (300 mg/day) for the past 14 years. His perinatal and neonatal period was uneventful. There was no history of alcohol intake or smoking. There was no history of similar illness in the family. On examination his higher mental functions were normal. Examination of cranial nerves, motor system and sensory system did not reveal any abnormality. Patient had difficulty in performing finger-nose, heel-shin test and tandem gait. He had Nystagmus with fast component towards the side of gaze. His gait was wide based. Skull and spine examination did not reveal any abnormality. His old medical records including MRI Brain (Dated 2004) were normal. Routine investigations were normal. Thyroid profile was normal. EEG was suggestive

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of Generalized seizure disorder. Diffuse cerebellar atrophy with normal supratentorial structures was evident on MRI Brain (Figure 1, 2, 3). Nerve conduction studies were normal. Serum Phenytoin level was 32 mcg/ml, which was far above the therapeutic level (10-20mcg/ml). Phenytoin was stopped immediately and patient was started on Tablet Levetiracetam. Physiotherapy was also advised.

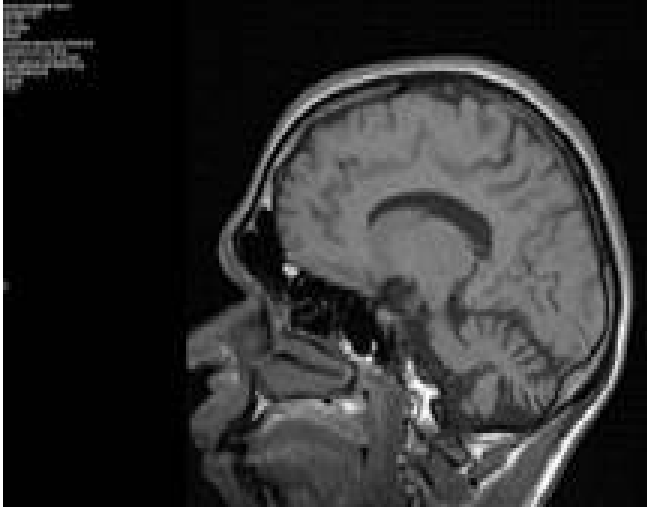


Fig.1: MRI brain (Sagittal T1W image) showing Diffuse cerebellar atrophy with normal supratentorial structures in an epileptic male on long term Phenytoin Therapy



Fig.2: Axial T2W image of brain showing diffuse cerebellar atrophy in an epileptic male on long term Phenytoin therapy

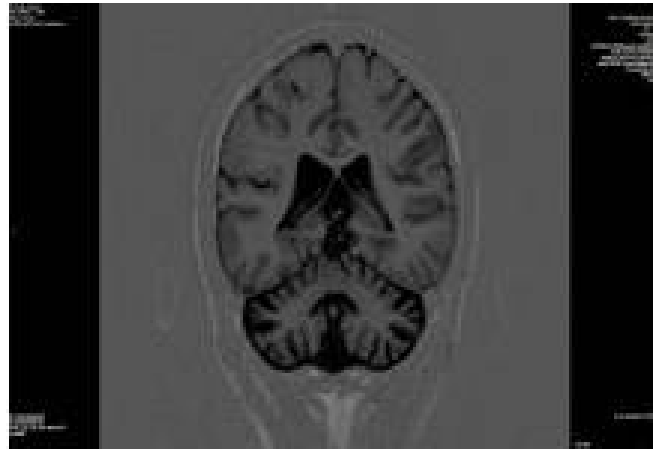


Fig.3: Coronal Flair image of brain showing diffuse cerebellar atrophy in an epileptic male on long term Phenytoin therapy

Discussion

Cerebellar atrophy refers to the degeneration of neurons in cerebellum which can be due to multiple etiologies.^{3,6} Transient cerebellar signs can be seen with Acute Phenytoin toxicity, which are usually reversible. More persistent ataxia with documented Purkinje cell loss and cerebellar atrophy can be seen with long term Phenytoin therapy.^{3,4,5,6} Hypotheses include direct toxic effect of phenytoin or effects of hypoxia or electrical discharges related to seizure episodes on Purkinje Cells.² In this patient, it is probably because of direct toxicity of Phenytoin as patient was relatively seizure free during Phenytoin therapy.³ Other etiologies of cerebellar atrophy include inherited diseases like Friedreich Ataxia, Spinocerebellar ataxia, Ataxia telangiectasia, Olivopontocerebellar atrophy etc. Paraneoplastic degeneration is seen in Small cell CA Lung (Anti Hu antibody), Breast CA (Anti Ri antibody) etc. Infectious causes include Viral Cerebellitis, HIV, Creutzfeldt-Jakob Disease etc. Toxic causes are alcohol (midline degeneration), Phenytoin, 5-FU, Mercury and Toluene. In cases of Cerebellar atrophy, it is better to avoid Phenytoin as it might have toxic effects on Cerebellum which leads to worsening of ataxic symptoms.³ Gabapentin/Levetiracetam are preferred alternatives in such cases.

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