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Case Report

A CASE REPORT ON PHENYTOIN INDUCED ATAXIA

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ABSTRACT

Phenytoin is commonly used anticonvulsant drug which has several adverse effects such as motor ataxia, dizziness, and visual disturbance. Here, we report a case of phenytoin toxicity presenting with behavioral disorder ensuring from underlying primary adverse effects of phenytoin that were clinically unnoted. A termination of phenytoin resulted in remission of side effects.

Keywords: Phenytoin toxicity, Anticonvulsant drug, Behavioral disorder.

INTRODUCTION

Phenytoin is a hydantoin anticonvulsant drug which is used for the treatment of epilepsy [1]. It is the foremost studied and unremarkably used anticonvulsant agent where its side effects and toxicity symptoms are well-documented [2]. It is well-known documented fact that phenytoin might unremarkably cause central nervous system effects such as sedation, vision disturbances, ataxia, nystagmus, muscle spasms, and psychosis additionally to different noted side effects like anemia, decreased serum folate level, bone mineral content, liver disease, immunoglobulin A deficiency, dysplasia, and lupus-like hypersensitivity syndrome [3,4]. Nystagmus, ataxia, and sleepiness are the most common adverse effects of phenytoin-related to dose (phenytoin toxicity) and are correlative with plasma levels. These adverse effects seem to appear once plasma levels reach 20 mcg/dl, 30 mcg/dl, and 40 mcg/dl; however, dose-related drug effects might show great variation among patients [1]. Studies indicate that neurological and cognitive adverse effects are common and harmful with phenytoin than with newer antiepileptics drugs [4]. Moreover, these psychological adverse effects of usual antiepileptic drugs may be more difficult in adolescent, physically lively cases and those patients with active quality of life, leading to a range of issues starting from poor performance in studies to impairment within the workplace [5].

CASE REPORT

A 40-year-old female, a resident of a rural place in Warangal (Telangana, India), a worker for daily wages, was on phenytoin for a history of seizures (generalized tonic-clonic) from 8 years duration. She has presented with symptoms of vertigo, trembling walk, slurred speech, and mild headache for 2 days. She was on mixed diet. She was having a history of change in skin color pigmentation (neurofibromatosis-Type1). The patient has not undergone any previous radio imaging and she was on tablet phenytoin, dose of 300 mg/day in multiple doses started by a private practioner.

The patient was conscious and coherent on examination. Nystagmus, dysarthria, gait ataxia, and bilateral cerebella signs were diagnosed on neurological examination.

Routine laboratory examination results were not significant in this patient.

Magnetic resonance imaging (MRI) showed gliotic area in the left temporal lobe with the external soft tissue mass in the left frontal region. Cerebral atrophy was seen on MRI scan report of the patient. Serum phenytoin level was 31.4 mcg/ml (10-20 mcg/ml) in the patient.

The identified adverse reaction was assessed and found to be "probable" with scoring 8 on Narenjo scale.

The patient was given supportive therapy with multivitamin tablets and change of anticonvulsant to tablet levetiracetam - 500 mg and tablet clobazam - 5 mg. She showed significant improvement of symptoms and was discharged after a period of 5-day and was on regular follow-up.

DISCUSSION

Movement disorders are not only caused by drugs that block dopamine receptors (antipsychotics) or central dopaminergic transmission but also may be observed occasionally due to anticonvulsants [6].

Studies on phenytoin have reported that it induces orofacial abnormality, athetosis, ballismus, myoclonus, and dystonia [7-9] on its usage. Phenytoin was found to be both clinically and experimentally noxious to the cerebellum and degeneration of Purkinjee cells were also seen after a single large overdose of phenytoin in humans [10,11]. These involuntary movements were mostly seen in patients with a high plasma phenytoin levels as found in our case where the plasma phenytoin levels were in toxic range (31.4 mcg/ml). Cerebellar degeneration was also found in patients with long-term phenytoin exposure [12,13]. The excess toxic level of phenytoin in blood at the time of diagnosis and disappearance of involuntary movements within 3 days of decrease dose of phenytoin rules out the chance of those unusual movements which is observed in our case study.

The symptoms experienced by the patient in our study were clear in terms of pharmacokinetics, narrow therapeutic index and individual variability in metabolism and elimination of phenytoin. The patient in the study developed increased side effects gradually over a period of 6-week after the dosage increase, which can be explained by gradual buildup of the drug over the time. Pharmacokinetics of phenytoin follows a nonlinear path which gets changed from first order to zero order kinetics, hence even a small change in a dose of phenytoin can result in variable serum concentrations because of elimination parameters of phenytoin being saturated [14].

Previous research has reported that these types of transient neurotoxic and ophthalmic side effects have occurred during first few hours of drug ingestion and is due to excessive fluctuation in plasma concentration of phenytoin between intake and time to achieve peak plasma concentration [14,15]. Toxic side effects of phenytoin may develop even at therapeutic dose as the association between serum level of anti-epileptic drugs, and their side effects was always found unpredictable [15].

This case report serves to aware clinicians to remain clinically observant for such symptoms in patients with active cognitive lifestyles who are on long-term phenytoin therapy.

CONCLUSION

This case emphasizes the importance of periodic anticonvulsant drug level monitoring and the importance of workup for the cause of seizures before starting convulsants.

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