Journal of Research in Medical and Dental Science
2020, Volume 8, Issue 5, Page No: 139-140

Available Online at: www.jrmds.in
eISSN No.2347-2367: pISSN No.2347-2545

Case of Phenytoin Induced Encephalopathy in a Six-Year-Old Girl

Fazeel Zubair Ahmed*

Department of Pharmacology, Viswabharathi Medical College, Kurnool, AP, India

ABSTRACT

Phenytoin is a widely used anti-epileptic among pediatric patients. It has a narrow therapeutic range hence monitoring for adverse effects is essential. Among its rare adverse effects is phenytoin induced encephalopathy. We have encountered one such case in our practice. A six-year-old girl received overdose of phenytoin due to ignorance of her history by practitioners. Understanding a patient's past medical record is essential before administering narrow therapeutic range medicines.

Key words: Phenytoin, Encephalopathy, Past record, Ignorance, Hamartoma, Narrow therapeutic range

HOW TO CITE THIS ARTICLE: Fazeel Zubair Ahmed, Case of Phenytoin Induced Encephalopathy in a Six-Year-Old Girl, J Res Med Dent Sci, 2020, 8(5): 139-140

Corresponding author: Fazeel Zubair Ahmed
e-mail ✉: fazeelzubair@yahoo.com
Received: 10/08/2020
Accepted: 24/08/2020

CASE REPORT

A six-year-old girl was brought to the casualty. She presented with altered sensorium. She was afebrile. History revealed that she was started on anti-epileptic medicines five years back as she was diagnosed of a seizure disorder. She used to have frequent episodes of seizures then. Her parents had discontinued those anti-epileptic medicines after few months when she was not developing any seizure. After discontinuing anti epileptics, she was started on some herbal drugs from different practitioners. Associated developmental delay was present. During the current event, this girl was taken to three different hospitals before being brought to our hospital. At all three hospitals she was administered injection phenytoin intravenously as loading dose of 15 mg/kg followed by maintenance dose of 5 mg/kg without seeing her past records. Hence totally she received 60 mg/kg. CSF analysis was done before arrival to our hospital and it was normal. Phenytoin levels were not investigated.

On examination, the girl was in altered sensorium without neck rigidity and afebrile. Cranial nerves deficit was not seen but nystagmus was observed. She had flexor plantar reflex, her tendon reflexes were normal, and muscle tone was normal. These findings were sufficient to exclude infective pathology. All other points of CNS examination were normal. Phenytoin overdose was being suspected. Her seizures were controlled with injection valproate. MRI brain revealed an old hamartoma. Her serum phenytoin levels were elevated (53 µg/ml). Based on all these findings, phenytoin induced encephalopathy was diagnosed.

Causality assessment

World Health OrganizationUppsala Monitoring center criteria were used for causality analysis and it showed probable / likely association. Hartwig severity assessment scale placed this case on level 4. According to Naranjo algorithm, this patient had score 6 which corresponded with possible association. The girl became conscious on second day of treatment. She was active and not having any neurodeficit. She was discharged and called for follow-up after a month. Until then she did not have any episode of seizure. We had advised a repeat MRI to see the effect of treatment on hamartoma, but her parents had refused.

Every drug has certain toxicities which become apparent due to prescription errors, dispensing errors, administration errors or dose adjustment errors or even due to changing brand or formulation [1-5]. Toxicity of phenytoin is exaggerated by acute overdose, diseases which alter pharmacokinetic properties, variation between individuals, drug interactions and mutations in drug metabolizing enzymes [6,7]. Nausea, vomiting, giddiness, and lethargy are common adverse effects of phenytoin. Among the neurological adverse effects altered sensorium, mental confusion, speech slurring, nystagmus, double vision, loss of normal gait and dystonia can be seen in some patients. Rapid infusion of phenytoin causes hypotension and cardiac rhythm abnormalities which are often fatal [8,9]. Metabolism of phenytoin occurs by parahydroxylation in liver, later it is conjugated by glucuronic acid. Phenytoin follows first order kinetics in low doses. When its metabolizing enzymes get saturated, it changes to zero order kinetics. Hence toxicity potential increases in high doses [10,11]. Phenytoin is administered

as a loading dose of 15–20 mg/kg/day followed by maintenance dose of 5–10 mg/kg/day [12]. It has very narrow therapeutic range of 10–20 µg/ml. Toxic signs appear when plasma levels cross > 20 µg/ml. Plasma level above 50 µg/ml often leads to fatality.

This girl received cumulative dose of 60 mg/kg in a span of less than 24 hours which led to acute toxicity. This case raises concern about how ignoring past records before treating serious patients can lead to grave consequences. Since this girl had undergone treatment in more than one hospital, her past records should have been checked thoroughly before commencing her further treatment plan. Treating physicians should have analyzed drug doses before diagnosing her as refractory case. When common causes cannot explain a presentation then drug toxicity and rare adverse effects must be reviewed. It must be etched in mind that every medicine has ability to cause toxicity and rare adverse effects are also experienced in regular practice.

FINANCIAL SUPPORT

Not required.

CONFLICTS OF INTEREST

Authors declare no conflict of interest.

REFERENCES

1. Dubey P, Perreira C, Kakode VP, et al. Encephalopathy due to phenytoin toxicity presenting with a striking diurnal fluctuation in an elderly man. J Case Rep 2019; 5:95–99.
2. Pandey S, Sharma P, Garg R, et al. Unexplained encephalopathy with phenytoin toxicity – hyperammonemia, the underlying cause. Neurol India 2018; 66:1829.
3. Menon VB, Kurian J, Undela K, et al. Phenytoin toxicity: A case report. J Young Pharm 2015; 7:272–275.
4. https://www.safetyandquality.gov.au/sites/default/files/migrated/Literature-Review-Medication-Safety-in-Australia-2013.pdf
5. Tariq RA, Vashisht R, Scherbak Y. Medication errors. In: StatPearls Treasure Island (FL): StatPearls Publishing 2020.
6. Melissa Faye Wu, Wai Hing Lim. Phenytoin: A guide to therapeutic drug monitoring. Proc Singap Healthc 2013; 22:198–202.
7. Shukla A, Sankar J, Verma A, et al. Acute phenytoin intoxication in a 4-year-old mimicking viral meningoencephalitis. BMJ Case Rep 2013; 2013: bcr2013009492.
8. Mathews SR, Badyal DK, Mathew R. Phenytoin-induced bradycardia and hypotension. Indian J Pharmacol 2019; 51:120–122.
9. Iorga A, Horowitz BZ. Phenytoin Toxicity. In: StatPearls Treasure Island (FL): StatPearls Publishing 2020.
10. Sharma K, Vakil A, Sokwala A, et al. Phenytoin toxicity treatment with haemodialysis in epilepsy due to glioblastoma multiforme: Case report and review of the literature. Case Rep Neurol 2019; 11:344–350.
11. Lucca J, Kishore M, Shruthi S. Phenytoin toxicity secondary to friend's advice. Ann Indian Psychiatry 2019; 3:60.
12. Selioutski O, Grzesik K, Vasilyeva ON, et al. Evaluation of phenytoin serum levels following a loading dose in the acute hospital setting. Seizure 2017; 52:199–204.