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Fosphenytoin

Updated: January 16, 2014.

OVERVIEW

Introduction

Fosphenytoin is a prodrug of phenytoin available in parenteral forms only. While not specifically associated with cases of drug induced liver injury, fosphenytoin is converted to phenytoin which is a well known cause of acute idiosyncratic drug induced liver disease.

Background

Fosphenytoin (fos' fen i toyn") is a hydantoin derivative that is a prodrug of phenytoin and converted rapidly to phenytoin and is likely to have the same mechanisms of activity, efficacy and side effects as phenytoin. Phenytoin acts by stablization of neuronal membranes through increasing the efflux and decreasing the influx of sodium ions across GABA regulated Na+ channels in neuron cell membranes. Fosphenytoin was approved for use in the United States in 1996. Current indications are for the short term treatment of tonic-clonic seizures and status epilepticus. Fosphenytoin is available in parenteral formulations in 2 and 10 mL vials in concentrations of 50 mg/mL generically and under the brand name Cerebyx. The recommended dose in adults is 10 to 20 phenytoin sodium equivalents intramuscularly or intravenously initially, and then 4 to 6 equivalents each day for maintenance dosing. Once oral therapy can be introduced, phenytoin is usually substituted.

Hepatotoxicity

Hepatic injury has not been specifically ascribed to use of fosphenytoin, but because it is metabolized to phenytoin, it is likely to cause similar hepatic injury.

Mechanism of Injury

The mechanism of fosphenytoin and phenytoin hepatotoxicity is not known, but is thought to be immunoallergic.

Outcome and Management

The course and outcome of hepatotoxicity from fosphenytoin should be similar to that of phenytoin.

Drug Class: Anticonvulsants, see also Phenytoin

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Fosphenytoin – Generic, Cerebyx®

DRUG CLASS

Anticonvulsants

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NUMBER	MOLECULAR FORMULA	STRUCTURE
Fosphenytoin	93390-81-9	C16-H15-N2-O6-P