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SHORT COMMUNICATION

Measurement of Blood Phenobarbital Concentration in Newborns Admitted to the NICU Of Imam Reza Hospital and receiving the drug via Intravenous Mode

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Abstract

Introduction: Newborns may be treated with phenobarbital for many reasons. Because in each region, depending on different races and genetic factors, different pharmacokinetic conditions govern the drug. It is essential to control blood levels of certain drugs, especially phenobarbital, and maintain these levels during treatment. In this study, we measure the level of phenobarbital in newborns who receive intravenous.
Methods: In this study, venous blood was collected from 50 neonates who received intravenous phenobarbital at a loading dose of 20 mg/kg weight, and at least, three days had passed since the maintenance dose of 5 mg/kg body weight in 24 hours, and sent to the laboratory. Phenobarbital blood levels were measured, and the results were analyzed descriptively.
Results: In this study, the average weight of newborns in two groups was 9.93 ± 2.58 kg. The mean blood concentration of phenobarbital, three days after starting the maintenance dose in the group of infants weighing more than 2.5 kg was 3.33 ± 9.1 micrograms/liter, in the group of infants weighing less than 2 kg. and half a kilogram or LBW was 5.9 ± 9.5 micrograms/liter, and in the group weighing less than 1.5 kg VLBW was 14.4 ± 15.46 micrograms/liter. There was no significant difference between case and control group ($p>0.05$). Three days after starting the maintenance dose in all three groups, the mean blood phenobarbital concentration was 9.86 ± 0.86 micrograms/liter.
Conclusion: Blood phenobarbital levels in our newborns are below therapeutic levels at day two, so phenobarbital levels should be evaluated.

Keywords: Newborn, Phenobarbital, Drug

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Phenobarbital can be used for anti-seizure management, treatment for status epilepticus, insomnia, as well as benzodiazepine and alcohol withdrawal treatment. This medication is used alone or with other medications to control seizures. Phenobarbital is used to treat infants (ages 0-1 year) with any type of seizure disorder, and other children with generalized, partial or febrile seizures. It is also used for the treatment of status epilepticus (seizures lasting greater than 15 minutes). Phenobarbital belongs to a class of drugs known as barbiturate anticonvulsants/hypnotics. It works by controlling the abnormal electrical activity in the brain that occurs during a seizure. Take this medication by mouth with or without food as directed by your doctor, usually once daily at bedtime for seizure control. Dosage is based on your medical condition, phenobarbital blood levels, and response to treatment. The dosage in children may also be based on weight. This medication works best when the amount of drug in your body is kept at a constant level (1).

Phenobarbital is one of the oldest anticonvulsants and sedative-hypnotics (1) and is widely used in treating many diseases, especially in neonates, including in treating direct hyperbilirubinemia. It is also used in infants and treating Withdrawal syndrome (2). Its intravenous form is used in neonates as 15 to 20 milligrams per kilogram (at a rate of one milligram per kilogram per minute) as a loading dose (Exeta Limit 40 mg per kilogram) and as a maintenance dose. from 3 to 5 mg. per kg every 24 hours is recommended (3). In particular, phenobarbital is one of the drugs that, due to large differences in drug pharmacokinetics in the neonatal age group, requires control of serum drug concentrations during treatment (2, 6). Because it is difficult to monitor drug concentrations through blood sampling in the pediatric and neonatal age groups, various methods have been proposed to facilitate this, such as using saliva to monitor drug levels (18) or using DBS.

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The findings showed that because infants may be treated with phenobarbital for various reasons, and since each region is based on different races and different genetic factors, different pharmacokinetic conditions govern the drug. The blood level of this drug in our patients is lower than the therapeutic level. More studies should be done.

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