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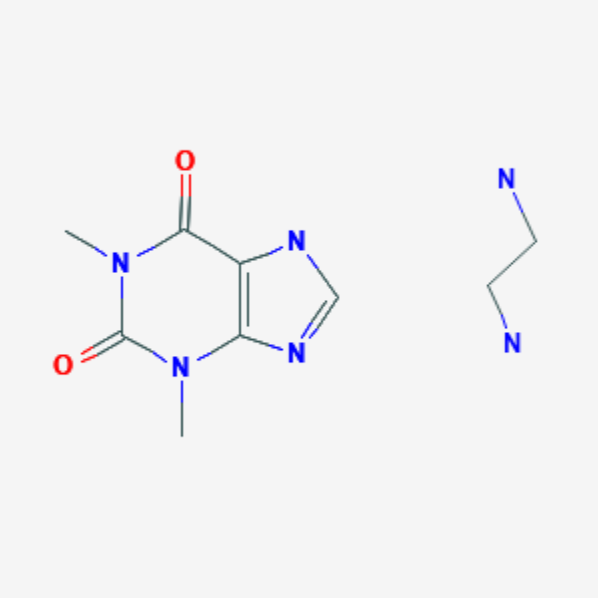
NLM Citation: Drugs and Lactation Database (LactMed) [Internet]. Bethesda (MD): National Library of Medicine (US); 2006-. Aminophylline. [Updated 2018 Oct 31].
Bookshelf URL: https://www.ncbi.nlm.nih.gov/books/

Aminophylline

Revised: October 31, 2018.

CASRN: 317-34-0



Drug Levels and Effects

Summary of Use during Lactation

An expert panel considers use of aminophylline to be acceptable during breastfeeding.[1] Maternal aminophylline use may occasionally cause stimulation and irritability and fretful sleep in infants. Newborn and especially preterm infants are most likely to be affected because of their slow elimination and low serum protein binding of theophylline. There is no need to avoid aminophylline products; however, keep maternal serum theophylline concentrations in the lower part of the therapeutic range and monitor the infant for signs of theophylline side effects. Infant serum theophylline concentrations can help to determine if signs of agitation are due to theophylline. Avoiding breastfeeding for 2 hours after intravenous or 4 hours after an immediate-release oral aminophylline product can decrease the dose received by the breastfed infant.

Drug Levels

Aminophylline is a salt of theophylline, which is the active drug found in maternal serum and breastmilk after aminophylline ingestion.

Maternal Levels. Theophylline rapidly equilibrates between plasma and milk. Peak milk levels occur 1 to 3 hours after oral ingestion of immediate-release products and almost immediately after intravenous administration. Milk levels parallel serum levels closely and average about 70% of simultaneous maternal serum levels.[2][3] Assuming that each 1 mg/kg of maternal theophylline increases her serum level by 2 mg/L, an exclusively breastfed infant would receive about 21% of the maternal weight-adjusted dosage of theophylline or 17% of the maternal dosage of aminophyllline.

Infant Levels. Theophylline is found in the serum of breastfed infants[4] In newborn infants with typical theophylline clearance rates, infant serum levels are expected to be between 1 and 4 mg/L with a maternal serum level in the therapeutic range of 10 to 20 mg/L.[2] Infant serum levels might occasionally accumulation to therapeutic levels in infants with slow clearance rates of the drug.[5]

Effects in Breastfed Infants

Irritability and fretful sleeping occurred in a 3-day-old breastfed infant on days of maternal aminophylline intake of 200 mg every six hours. These effects ceased with discontinuation and recurred on rechallenge over the next 9 months. These effects were probably caused by theophylline in breastmilk. Another five infants reported in this paper showed no adverse reactions after maternal theophylline ingestion.[3] Accumulation of theophylline in infant serum appears most likely in neonates and premature infants because they eliminate theophylline slowly.[2][5]

Effects on Lactation and Breastmilk

Relevant published information was not found as of the revision date.

Alternate Drugs to Consider

Terbutaline

References

1. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program Asthma and Pregnancy Working Group. NAEPP expert panel report. Managing asthma during pregnancy: recommendations for pharmacologic treatment-2004 update. 2004;1-57. Available at: http://www.nhlbi.nih.gov/health/prof/lung/asthma/astpreg.htm
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3. Yurchak AM, Jusko WJ. Theophylline secretion into breast milk. Pediatrics. 1976;57:518-25. PubMed PMID: 1264548.
4. Gardner MJ, Schatz M, Cousins L et al. Longitudinal effects of pregnancy on the pharmacokinetics of theophylline. Eur J Clin Pharmacol. 1987;31:289-95. PubMed PMID: 3595701.
5. Reinhardt D, Richter O, Brandenburg G. [Pharmacokinetics of drugs from the breast-feeding mother passing into the body of the infant, using theophylline as an example]. Monatsschr Kinderheilkd. 1983;131:66-70. PubMed PMID: 6843559.

Substance Identification

Substance Name

Aminophylline

CAS Registry Number

317-34-0

Drug Class

Breast Feeding

Lactation

Anti-Asthmatic Agents

Bronchodilator Agents