

MOTHERISK UPDATE

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Continuing drug therapy while breastfeeding

Part 2. Common misconceptions of physicians

ABSTRACT

QUESTION Is there any way to predict whether a drug taken by a mother is safe for a suckling baby, or is it just trial and error? One of my patients is receiving lithium for manic depression. She wishes to breastfeed, but clinically there is no way she can discontinue the drug. My sources say the drug is incompatible with breastfeeding.

ANSWER The amount of drug available to a baby through breastmilk is estimated as the percentage of maternal dose per kg ingested by the baby. Because infants' clearance rate of many drugs is slower than adults', however, the true level of the drug circulating in the infant's blood might be much higher. Because lithium can be measured in plasma, it is prudent to measure it in milk and to estimate the "baby dose." If a baby shows any adverse effects, lithium levels should be measured in its blood.

Many women need drug therapy during the postpartum period to treat chronic or acute medical conditions. Mothers are naturally concerned about the potential risk to their suckling infants from drugs introduced through the milk. Hence, it is crucial to identify methods that accurately define the safety or risk of such exposures, because every year scores of new drugs are introduced to the market.

For many years, the ratio between drug concentrations in maternal milk (m) and plasma (p) was used to estimate how much drug was getting through to a baby. The higher the m/p ratio, the higher concentrations were available to a baby, people assumed. This approach, however, was too simplistic from a pharmacokinetic viewpoint, because a drug's clearance rate from a baby's body is as important as the amount of drug offered to the baby.

Several years ago the Motherisk team developed a new concept, the Exposure Index (EI), which incorporated both the m/p ratio and the clearance rate of the drug.¹ The formula is:

$$EI = \frac{100 \times m/p \text{ ratio}}{\text{clearance (mL/kg/min)}}$$

The EI, in simple terms, is the percentage of maternal dose per kg available to a baby. This equation implies that, even if a drug appears at higher concentrations in milk than

in maternal plasma, the clearance rate of the drug will define its safety. Experimental data show that this new concept better estimates the risk to the baby than the old m/p ratio.¹

In the case of lithium, which has a high m/p ratio, the EI is unsafely high in many infants, but, due to individual (faster) renal clearance rates, is quite low in many others. In several recent cases, we allowed women receiving lithium, who attended Motherisk, to breastfeed provided lithium levels were measured in breastmilk or neonatal blood. In other cases, such measurements proved the drug unsafe. We concluded that therapeutic drug monitoring could help ascertain whether breastfeeding was safe for women receiving drugs for which there are readily available methods of measurement.

Another relatively common misconception among

Do you have questions about the safety of drugs, chemicals, radiation, or infections in women who are pregnant or breastfeeding? We invite you to submit them to Dr Gideon Koren by fax at (416) 813-7562; they will be addressed in future Motherisk Updates.

Published Motherisk Updates are available on the College of Family Physicians of Canada website (www.cfpc.ca). Some articles are published in *The Motherisk Newsletter* also. The research described in this Motherisk Update is supported by grants from the Medical Research Council and The Motherisk Research Fund.

Motherisk questions are prepared by the **Motherisk Team** at the Hospital for Sick Children in Toronto and edited by **Dr G. Koren**, Professor of Pediatrics in Pharmacology, Pharmacy, and Medicine at the University of Toronto. **Ms Moretti** and **Dr Ito** are members of the Motherisk Team.

CLINICAL CHALLENGE

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DÉFI CLINIQUE

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physicians is in their approach to breastfeeding for women who drink alcohol or smoke cigarettes. While common sense dictates not drinking while breastfeeding, many women are chemically dependent and are unable to discontinue drinking. Advising them not to breastfeed ignores the increased morbidity and mortality among formula-fed babies. Dr Jack Newman eloquently stated the case: "Those using drugs are also at risk on many levels for increased infant morbidity and mortality. It is when the socioeconomic situation is the worst that breastfeeding has the greatest benefit."² ◆

References

1. Ito S, Koren G. A novel index for expressing exposure of infants to drugs in breast milk. *Br J Clin Pharmacol* 1994;38:99-102.
2. Newman J. Drugs in breastfeeding. *Motherisk newsletter* 1995;4:4.

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CLINICAL CHALLENGE ◆ DÉFI CLINIQUE

Ophthalmopblem

Sanjay Sharma, MD, MSC, FRCSC

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A 23-year-old man came to the office for evaluation of his right eye after sustaining a tree branch injury. He had a corneal abrasion and received a patch to immobilize the eye.

The left fundus photograph demonstrates which of the following?

1. Optic nerve pit
2. Disk neovascularization
3. Glaucoma
4. Papilledema

Answer on page 1185

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