But Is It Safe for My Baby? Medications and Breastfeeding

Mothering Magazine
by Thomas W. Hale
Issue 111 March/April 2002

The decision to prescribe medication for a breastfeeding mother is one of the most contentious areas in the clinical practice of medicine. For legal reasons alone, most manufacturers and many physicians advise patients to discontinue breastfeeding while they take various medications. Look at any package insert; invariably, the manufacturer recommends that the physician avoid prescribing the drug for breastfeeding mothers. Often doctors advise nursing mothers to "pump and dump" while taking an antibiotic, not knowing that they may be initiating a dangerous spiral toward a poor milk supply, or endangering the infant by introducing a poorer food source such as formula early on.

The fact is that all medications enter breastmilk, but most are so low in concentration that they have no clinical effect on infants. There are thousands of research papers illustrating this point.1-3 With few exceptions, most drugs can be safely used by breastfeeding mothers. So the decision about whether to take the drug and breastfeed, or to risk the hazards of introducing artificial formulas to your infant, is really up to each mother.

Most authoritative sources suggest that if the daily dose to the infant is less than 10 percent of the mother's dose, it is unlikely to bother the infant.4 This is generally accurate, and very few drugs exceed this limit. The American Academy of Pediatrics has published an extensive list of drugs acceptable for use by breastfeeding mothers.5 Most physicians are not aware of this, unfortunately, and it may be a nursing mother's job to bring this information to them.

Transmission of Drugs into Breastmilk

Drugs transfer into milk largely as a function of their plasma levels. As the mother's plasma level rises, the concentration in her milk rises, too. Most drugs are absorbed into the bloodstream, rise to a peak, and then rapidly decline to a much lower level. Therefore, to reduce your infant's exposure avoid breastfeeding when your medication peaks in your plasma. An ideal way to do this is to nurse your infant before you take the medication. The next time you feed (perhaps several hours later) the drug concentration in your blood may be much lower, and therefore the concentration in milk will be lower. This works well for drugs that must be taken repeatedly during the day (see fig. 1) but not so well for drugs that have long durations (half-lives), or for mothers who breastfeed every hour or two. Remember, drugs don't stay in milk; they enter as the mom's plasma level is increasing, then exit as the mother's levels start to drop.

Of course, if the drug is not absorbed by the mother or the infant it presents no problem. Large-molecular-weight drugs, such as heparin, interferon, and insulin, barely penetrate into milk and are poorly absorbed by infants. If a drug is not absorbed orally, it is unlikely that the infant will be affected (see Table 2).

Nature designed a wonderful barrier in the cells that create breastmilk to keep drugs and exogenous chemicals out. Most drugs have great difficulty passing into milk because they have to pass these tight membrane barriers. This is why, on the average, less than 0.1 to 1 percent of a mother's dose of medication is actually transferred to the infant. Frequently the figure is even lower. For example, if your dose is 100 mg three times daily your infant probably ingests less than 3 mg daily. This amount is often too low to elicit a response in the infant.

Evaluating Infant Sensitivity to Medications

Of course, some infants are more sensitive than others to medications. Newborn and premature infants, those with poor liver or kidney functions, and those with specific pathologies, such as severe breathing difficulties, may be more sensitive. Infants subject to breathing difficulties should not be exposed to Valium-like drugs, beta-blocker high blood pressure medications, and sedating antihistamines without close monitoring. Neonates in the first month of life should not be exposed to sulfonamides or other drugs with high protein binding that might increase bilirubin levels. Ill or weakened infants should always be closely evaluated before a breastfeeding mother takes medication. But a big, healthy six month old can probably metabolize drugs as well as you can and is much less sensitive to the small amount of drugs present in your milk.

Ideal Drug Factors

A nursing mother should choose drugs that have shorter half-lives. If possible, as noted above, she should not breastfeed when the drug peaks in her circulation. Although not contraindicated, she should be more cautious of medications with long half-lives. Certain drugs (Prozac and Demerol, for instance), when metabolized by the liver, produce active metabolites with incredibly long half-lives, which can build up over time in the infant and produce side effects. But even many medications with longer half-lives (phenobarbital, etc.) can be used safely, if the baby is observed closely.

Drugs That Directly Affect Milk Production

Quite apart from their ability to enter milk, some drugs have the potential to affect the production of breastmilk, either increasing or suppressing it. Early lactation is apparently highly sensitive to the level of circulating prolactin, the milk-producing hormone from the mother's pituitary. Drugs that stimulate prolactin early on, such as metoclopramide (Reglan), domperidone, and other dopamine antagonists, may actually increase the rate of breastmilk production. Some drugs, such as birth control pills with estrogens, are well known for suppressing lactation if administered early postpartum. Stay away from estrogen-containing birth control pills until at least six weeks postpartum, and then watch your milk supply closely. If it is suppressed, stop the birth control pills.

Specific Drugs

Analgesics

The analgesics most commonly used by breastfeeding women are acetaminophen and ibuprofen. Both are ideal, because the levels they attain in breastmilk are largely subclinical, and both are cleared for pediatric use. Levels of ibuprofen transferred into milk following 400 mg maternal doses are generally less than 1 mg per liter of milk. Long-acting nonsteroidals (NSAIDS) such as naproxen (Aleve, Naprosyn) should be avoided, although they are not absolutely contraindicated if used only briefly, say for a few days.

Codeine and hydrocodone are often used for mild postpartum pain. The amount of codeine transferred into milk is marginal, although sedation and apnea have been reported with frequent, higher doses. If doses of codeine and hydrocodone are kept low and administered after breastfeeding, few cases of neonatal sedation have been reported. In many respects, morphine continues to be an ideal strong opiate for breastfeeding mothers in moderate to severe pain. Due to poor oral absorption (26 percent), morphine produces only minimal sedation in breastfed infants. Frequent and repeated exposure, however, can lead to accumulation in the infant and should be avoided.

Antihistamines/Decongestants

Breastfeeding women often use antihistamines, sometimes in combination with decongestants, for cold symptoms or seasonal allergies. The older families of antihistamines--diphenhydramine (Benadryl), chlorpheniramine(Chlor-Trimeton), and brompheniramine(Dimetapp)--may produce sedation in infants but not always. Because sedation in newborns may predispose them to breathing difficulties, nonsedating antihistamines, such as cetirizine (Zyrtec) and loratadine (Claritin), are preferred.

As for the decongestants present in many cold remedies, be cautious. New data from my laboratories suggest that pseudoephedrine may significantly suppress milk production, and I no longer recommend it for breastfeeding mothers. Many antihistamine/decongestant preparations are not very effective for colds and flu symptoms anyway and may not prove beneficial enough to risk side effects in the infant. To treat seasonal allergies (allergic rhinitis), intranasal steroids are ideal for breastfeeding mothers, as their systemic absorption is minimal.

Antibiotics

Virtually all antibiotics are safe for breastfeeding mothers to use, with the possible exception of the "Cipro" family and the sulfonamides early postpartum. Penicillins, erythromycins, and cephalosporins enter milk only in trace levels and rarely produce allergies or changes in GI flora in the infant. Rashes, thrush, and diarrhea are the only likely consequences of exposure to these families of drugs, and they are rare. Although there are exceptions to this rule, most fluoroquinolone antibiotics (Cipro) should be avoided, but some of them (Ofloxacin) are not definitely contraindicated.

Sulfonamide drugs are seldom used during the last trimester of pregnancy and the first month postpartum, due to the potential for increasing free bilirubin levels in the infant. After the first month of life, sulfonamides are quite safe in most infants who do not have elevated bilirubin levels.

Metronidazole (Flagyl), which is commonly used for trichomoniasis, giardiasis, and anaerobic infections, is controversial due to rat studies that suggested it was mutagenic. Today Metronidazole is not considered mutagenic in humans, and it is commonly used in pediatrics, particularly with premature infants. The tetracyclines can be briefly used by breastfeeding women. While many of the older tetracyclines were poorly absorbed, especially in milk, this is not necessarily true for newer ones like doxycycline or minocycline. However, doxycycline is still preferred in pediatric patients because the risk of dental staining is lower than with other tetracycline products. If the treatments are kept brief (no more than several weeks), the amount transferred and the effect on skeletal growth and dental discoloration will be minimal.6

Antihypertensives

Antihypertensives include the beta receptors, calcium channel blockers, angiotensin converting enzyme (ACE) inhibitors, and several others. Many of these agents have been thoroughly studied in breastfeeding mothers.7-10 Certain beta blockers, such as acebutolol and atenolol, have been associated with a higher incidence of hypotension and hypoglycemia in breastfed infants and should be avoided.11,12 Propranolol and metoprolol are probably preferred, due to their lower levels in milk. But all infants exposed to the beta blocker family should be closely monitored for apnea, weakness, and low blood sugar. Several of the calcium channel blockers, including verapamil, bepridil, nifedipine, and nimodipine, produce exceedingly low levels in milk and are therefore preferred.

ACE inhibitors are more problematic. Due to extreme potency in neonates, they are universally contraindicated in the last trimester of pregnancy. Although the reported levels in milk are low, the use of these agents in the early neonatal period is probably too risky. Captopril or enalapril can probably be used by breastfeeding mothers several weeks to one month postpartum, with due caution.13,14

Antidepressants

With the introduction of newer antidepressants, the number of patients receiving treatment for depression has risen significantly. Societal perception of antidepressant therapy has likewise changed to a point where it is quite acceptable to seek and receive treatment for depression. About 15 to 20 percent of postpartum women experience clinical depression, although about 80 percent will experience postpartum blues. Recent evidence that depression may interfere with optimal parenting, and that infants of depressed women may suffer from developmental problems, has increased the urgency of treating this syndrome in breastfeeding women.15, 16

The tricyclic family, which includes amitriptyline (Elavil) and numerous others, is the oldest family of antidepressants. According to more than 40 published articles about various members of this family, the amount transferred into human milk is for the most part quite low. However, tricyclics are replete with untoward side effects in the mother, including constipation, sedation, dry mouth, and blurred vision. They are also horribly toxic in overdose, and most clinicians are reluctant to prescribe them for patients who are already depressed and at risk for suicide. Thus far, however, neurobehavioral development of breastfed infants exposed to tricyclic antidepressants in breastmilk appears normal.17

The most popular family of antidepressants is the serotonin reuptake inhibitors (SSRIs), including fluoxetine (Prozac), sertraline (Zoloft), paroxetine (Paxil), and others. Prozac, the best-selling of this group, is presently the subject of some concern. It is metabolized to an active, long half-life metabolite called norfluoxetine, which has a long 360-hour half-life. This metabolite has been found in high levels in the plasma of several breastfed infants and has been correlated with a number of untoward effects such as colic, lengthy crying, vomiting, decreased sleep, watery stools, and coma. Because Prozac now has FDA clearance for use in pregnancy, infants of mothers taking it will be born with high levels of the drug in their plasma. In these cases, it is possible that the small amount transferred in breastmilk will continue to build to toxic levels. Fluoxetine should no longer be viewed as a preferred product for breastfeeding mothers with newborns, whose infants may not be able to eliminate the drug well. In older infants it is probably much safer.

The use of Zoloft, on the other hand, has been reported in more than 30 breastfed infants, and appears to transfer poorly to the infant and with no reported effects.18,19 Thus far plasma levels in most infants have been close to or below the limit of detection, with no reports of untoward effects in the infant. At this time, Zoloft is probably the SSRI of choice for nursing mothers. Several reports of Paxil use suggest that its levels in breastmilk are exceedingly low, and the amount transferred to the infant would be minimal.

Contraceptives

As noted above, estrogen-containing oral contraceptives may dramatically suppress lactation and therefore infant growth. The estrogen component, if used early postpartum, is well known to significantly suppress lactation in some women, leading to early supplementation and ultimately suppression of breastfeeding. The progestins in general do not suppress lactation in most women; medroxyprogesterone (Depo-Provera) has been used by many women with success, although there have been some reports of milk suppression. Because of this risk,

oral progestin-only mini pills are the preferred oral contraceptives for breastfeeding mothers.

Corticosteroids

Steroid use is categorized according to the method of administration: oral, inhaled, intranasal, or topical. The transfer of oral prednisone and prednisolone into human milk is generally quite low and is dependent on the maternal dose. With extremely high doses of 120 mg/day, breastmilk levels vary from 54 to 627 micrograms/liter of milk and only provide approximately 47 micrograms/day to the infant, an insignificant amount. The transfer of methylprednisolone into milk is equally minimal. In general, the systemic absorption of topical, inhaled, and intranasal steroids is so low that these agents are unlikely to pose problems for a breastfed infant. Although the topical application of low-potency steroids directly to the nipple can be overdone, minimal and infrequent applications cause no problems. But note that only low-potency steroid creams/ointments, such as hydrocortisone or triamcinolone, should be used on the nipple.

Finally, steroids have potent and long-lasting aftereffects in infants when misused, and the long-term exposure of breastfed infants to maternal steroids should be approached with a risk-versus -benefit assessment that includes length and duration of exposure, route of administration, and the overall maternal dose. The infant should be followed closely for appropriate growth and development parameters.

Herbal Medications

Herbal drugs are frequently viewed as safer alternatives to conventional medications, but this is not necessarily the case, particularly for pregnant and breastfeeding mothers. Most studies of herbal products are poorly done, and their reported efficacy is often exaggerated. Herbals that contain anticholinergics, or more importantly the pyrrolizidine alkaloids, can be extremely dangerous and should be avoided. These include chapparal, jin bu huan, gerymander, comfrey tea, mistletoe, skullcap, margosa oil, mate tea, pennyroyal oil, blue cohosh, and many others.

Other herbals, however, have excellent safety profiles. There is little evidence of acute toxicity from fenugreek, for instance, commonly believed to stimulate milk production (although data documenting its milk-stimulating effect are sketchy at best). A significant body of literature exists suggesting that St. John's wort is relatively efficacious as an antidepressant and devoid of significant side effects. We do not know, however, if it transfers into human milk, or if it is safe in breastfeeding mothers. At this time, using herbal products while breastfeeding is risky at best, primarily due to our limited experience and knowledge, and should in general be avoided altogether.

Vaccines

There are occasions when breastfeeding mothers may require vaccination, as in the case of women who are rubella negative, those who need influenza vaccines, or those planning to visit foreign countries. While it is possible that even weakened (attenuated) viruses, such as those used in vaccines, can transfer to the infant, thus far no serious untoward effects have been reported. The Centers for Disease Control and the American Academy of Pediatrics clearly state that all vaccines can be safely used in breastfeeding mothers.

Alcohol

We know that small amounts of alcohol do transfer into human milk. The amount an infant receives following several drinks is not enough to harm most normal infants. Mothers should, however, limit their intake to no more than two small drinks. Some infants may not like the

taste imparted to milk and may refuse breastfeeding, but this passes quickly. Women who drink excessively should wait until they are sober to begin breastfeeding. Chronic or binge drinking should, of course, be discouraged, as higher levels of alcohol are believed to significantly suppress milk production.

Pumping and Dumping

It would be extremely rare that a mother would need to pump and discard her milk, as most drugs pass into and then out of milk as the mother's blood levels drop. However, there are some occasions when complete cessation or short-term pumping and discarding would be advisable. This is particularly important with various radioactive drugs, certain anticancer drugs, drugs of abuse, and various antibiotics (see Table 2).

In the last decade it has become increasingly evident that breastfed babies are the healthiest of babies. Every pediatrician knows that breastfeeding is like an additional immunization, one that covers a wide array of bacteria, viruses, and other infections. Regarding the use of medications by breastfeeding mothers, many healthcare professionals worry about litigation and advise patients to totally discontinue breastfeeding while taking many medications. This is not necessary. In some cases, virtually any interruption of breastfeeding can lead to permanent loss of milk supply.

The question that should always be asked is, "Is this drug really necessary, or could the mother do without it?" If the drug is not really necessary or efficacious (as with cold or herbal remedies), don't expose your infant to it. In cases where the drug is important to the mother's health, the proper choice of medication is advised. Because so many physicians are not aware of the transfer of drugs into human milk, it has increasingly become the responsibility of the mother and other healthcare practitioners to educate them. Help is available from sources such as lactation consultants and La Leche League leaders.

Human milk is the most wondrous immunization and nutritious food you can give your infant. Removing the infant from the breast for specious reasons should be resisted with all the science we can muster. Fortunately, we now have the data to support us in this effort.

NOTES

1. T. W. Hale and K. F. Ilett, "Drug Therapy and Breastfeeding," Contemporary Clinical Gynecology and Obstetrics 1 (2001): 129-148.

2. P. A. Anderson, "Drug Use during Breast-feeding," (Review) Clinical Pharmacy 10 (1991): 594-624.

3. T. W. Hale and K. F. Ilett, Drug Therapy and Breastfeeding: From Theory to Clinical Practice (London: Parthenon Publishing Group, 2001), 1-93.

4. P. N. Bennett, "Use of the Monographs on Drugs," in Drugs and Human Lactation, 2nd ed. (Amsterdam: Elsevier, 1996), 67-74.

5. "The Transfer of Drugs and Other Chemicals into Human Milk," Pediatrics 108 (2001): 776-789.

6. Report of the Committee on Infectious Diseases: Red Book 2000, 25th ed. (Elk Grove Village, IL: American Academy of Pediatrics, 2000).

7. R. G. Devlin and P. M. Fleiss, "Captopril in Human Blood and Breast Milk," J Clin Pharmacol 21 (1981): 110-113.

8. C. W. Redman et al., "The Excretion of Enalapril and Enalaprilat in Human Breast Milk," Eur J Clin Pharmacol 38 (1990): 99.

9. B. Sandstrom and C. G. Regardh, "Metoprolol Excretion into Breast Milk," Br J Clin Pharmacol 9 (1980): 518-519.

10. M. T. Smith et al., "Propranolol, Propranolol Glucuronide, and Naphthoxylactic Acid in Breast Milk and Plasma," Ther Drug Monit 5 (1983): 87-93.
11. M. J. Boutroy et al., "To Nurse When Receiving Acebutolol: Is It Dangerous for the Neonate?" Eur J Clin Pharmacol 30 (1986): 737-739.
12. M. S. Schimmel et al., "Toxic Effects Of Atenolol Consumed during Breast Feeding," J Pediatr 114 (1989): 476-478. (Published erratum appears in J Pediatr 116, no. 1 (1990): 158.)
13. See Note 7.
14. See Note 8.
15. D. Sinclair and L. Murray, "Effects of Postnatal Depression on Children's Adjustment to School. Teacher's Reports." Br J Psychiatry 172 (1998): 58-63.
16. E. M. Zekoski et al., "The Effects of Maternal Mood on Mother-infant Interaction," J Abnorm Child Psychol 15 (1987): 361-378.
17. A. Buist and H. Janson, "Effect of Exposure to Dothiepin and Northiaden in Breast Milk on Child Development," Br J Psychiatry 167 (1995): 370-373.
18. J. H. Kristensen et al., "Distribution and Excretion of Sertraline and N-desmethylsertraline in Human Milk," Br J Clin Pharmacol 45 (1998): 453-457.
19. Z. N. Stowe et al., "Sertraline and Desmethylsertraline in Human Breast Milk and Nursing Infants," Am J Psychiatry 154 (1997): 1255-1260.

Thomas W. Hale, RPh, PhD, is an associate professor of pediatrics at Texas Tech University School of Medicine at Amarillo and a leading authority in the field of lactation. He is the author of three books on using drugs while breastfeeding, including Medications and Mothers' Milk, the top-selling reference on drugs and breastfeeding in the world. To order any of his three books in this field or other breastfeeding books go to ***www.iBreastfeeding.com*** *or call Pharmasoft Publishing: 800-378-1317, 806-376-9900. In addition to his books, Dr. Hale has an academic website for the distribution of information on using drugs with breastfeeding patients: neonatal.ama.ttuhsc.edu/lact.*

Table 1. **Partial list of medications of concern or those contraindicated**

Drug: Effect on lactation/infant
ACE inhibitors: High risk of hypotension in young neonates but no problem for older infants
Acebutolol: Low blood pressure, low glucose levels, and breathing difficulties (apnea)
Amphetamines: Loss of appetite, agitation; risk does not justify use
Anticancer agents: Possible immunosuppression/toxicity in neonate
Barbiturates: Monitor for infant sedation
Benzodiazepines (Valium drugs): Chronic use may lead to infant sedation and/or dependence
Bromocriptine (Parlodel): Inhibits lactation; suppresses prolactin
Cabergoline (Dostinex): Inhibits lactation and prolactin
Cocaine: Infant intoxication
Ergotamine: Inhibits lactation and prolactin
Estrogens: Suppresses lactation; use with caution
Fluoroquinolones: Some may produce bloody diarrhea
Lithium: Monitor maternal/infant plasma levels and thyroid function; use with great caution
Lovastatin and others: Lowers cholesterol; risk does not justify use
Methotrexate: Possible immunosuppression; loss of white blood cells; accumulation in gastrointestinal tract
NSAIDS: Avoid prolonged use of long half-life NSAIDS; GI distress, diarrhea
Antipsychotics: May induce sedation, increase risk of apnea
Radioactive Iodine-131: Accumulation in milk/breasts; thyroid toxicity/carcinoma

Table 2. **Radioactive and other medications for which temporary pumping and discarding of milk is recommended**

Medication: Recommended Period of Interrupted Breastfeeding
Radioactive Iodine-131: Complete cessation
Radioactive Iodine-123: 24 hrs for 10 mCi(millicurie); 12 hours for 4 mCi
Radioactive Iodine-125: Complete cessation
Tc-99m Pertechnetate: 24 hrs for 30 mCi; 12 hrs for 12 mCi
Tc-99m Sulfur Colloid: 6 hrs for 12 mCi
Tc-99m WBC: 24 hrs for 5 mCi; 12 hrs for 2 mCi
Gallium-67: 1 month for 4 mCi; 2 weeks for 1.3 mCi; 1 week for 0.2 mCi
Indium-111: 1 week for 0.5 mCi
Thallium-201: 24-48 hrs following 111 MBq (megabecquerel)
Cisplatinin: 3-7 days postinfusion
Cocaine: 24 hours
Metronidazole: 12-24 hours following 2-gram dose only
Doxorubicin: Complete cessation
Copper-64: 50 hours

Table 3. **Some of many medications considered safe for use by breastfeeding mothers**

Penicillin antibiotics
Cephalosporin antibiotics
Flagyl (Metronidazole)
Reglan (metoclopramide)
Zoloft (sertraline)
Paxil (paroxetine)
Motrin, Advil (Ibuprofen)
Tylenol (acetaminophen)
Inderal (propranolol)
Zithromax (azithromycin)
Erythromycin antibiotics
Codeine
Morphine at moderate doses
Pepcid(famotidine)
Prilosec (omeprazole)
Heparin
Insulin
Diflucan (fluconazole)
All vaccines

Ideal drug characteristics for breastfeeding mothers:

Drugs with shorter half-lives
Drugs with poor oral absorption
Drugs low in toxicity
Drugs that are non-sedating

Suggestions for breastfeeding mothers

Use medications only when necessary.

Be flexible; choose medications that are preferred for breastfeeding mothers.
Medications cleared by the FDA for infants are generally safe for breastfeeding mothers, too.
Avoid maternal peak blood levels when breastfeeding.
Use drugs that are poorly absorbed or inactive orally.
Use drugs with shorter half-lives.