Canterbury District Health Board
Te Poari Hauora ō Waitaha

Clinical Pharmacology Bulletin

Department of Clinical Pharmacology, Christchurch Hospital, Private Bag 4710, Christchurch

Drug Information Service **Phone**: 80900 **Fax**: 80902
Drug Utilisation Review **Phone**: 89971 **Fax**: 81003

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Drugs and breastfeeding

Most women take at least one drug during breastfeeding. Parental perception of the magnitude of risk associated with breastfeeding during maternal drug use may lead to non–compliance with drug therapy or unnecessary cessation of breastfeeding. Given that breastfeeding has benefits for the baby and mother, it is essential to have access to accurate and useful data when making decisions around drug use during breastfeeding.

Drug transfer

All drugs transfer into breast milk to some extent, except for very large molecules, e.g. insulin, that are too big to cross biological membranes by diffusion. Most drugs transfer by passive diffusion. The extent of transfer depends on properties of the drug, particularly the pKa, protein binding and lipophilicity, and the different composition of blood and milk (e.g. fat content is 2.5% and 19%, respectively). Drugs more readily distribute into milk if they are basic, have low protein binding and are lipophilic.

Infant risk

The risk to the breastfeeding infant depends on:

- the 'dose' of drug ingested in milk;
- the drug's oral availability,
- the infant's clearance; and
- the toxicity of the drug.

The 'dose' of drug ingested in milk is dependent on the concentration of the drug in milk and the volume of milk ingested i.e. dose = concentration x volume. The infant's dose in milk can be put into perspective by comparing it with the therapeutic dose for an infant of comparable age and weight. For example, babies may receive up to 5mg/kg/day of paracetamol in milk during therapeutic maternal dosing, which is about 6-8% of the therapeutic infant dose (60–90mg/kg/day). However, for many drugs, dosing data will not be available as many drugs are not prescribed to infants (e.g. antidepressants). Therefore, it is more common practice to compare the infant's dose with the maternal dose corrected for respective body weight. This is called the 'weight-adjusted maternal dose' (WAMD) or 'relative infant dose':

$$\text{WAMD} = \frac{\text{infant dose in milk (mg/kg/day)}}{\text{maternal dose (mg/kg/day)}} \times 100\,(\%)$$

If the WAMD is <10% of the maternal dose, the drug is likely to be 'safe' in breastfeeding assuming that the mother is taking usual therapeutic doses and that the infant is healthy. However, a WAMD < 10% may be unsafe if the baby is very young, the mother's dose is very high or if the drug is very toxic. Many drugs (e.g. penicillins and NSAIDs) are regarded as 'safe' (see the Preferred Medicines List or "Pink Book").

The drug's oral availability determines the total amount of drug in the infant after ingestion in milk. Drugs with low oral availability (e.g. gentamicin) are likely to be safe, as although the drug is present in milk, negligible amounts are absorbed and enter the infant's systemic circulation. The drug may still have local effects in the gut, such as alteration of gut flora by antibiotics.

The infant's clearance is an important factor when assessing infant risk as this determines mean concentrations in the infant. Infants have reduced ability to eliminate drugs compared with adults until they are about six months old because of immature renal and hepatic systems. Special care should be taken in premature neonates. A baby born at 30 weeks' gestation may have only 20% of the clearance of a term baby. The mean concentration of drug in their blood may therefore be five times higher for a given 'dose' of a drug in milk, compared with a term baby.

The toxicity of the drug must also be considered. A WAMD < 10% may be unsafe if the drug is unduly toxic (e.g. cytotoxic medicines such as methotrexate).

What data are available to help you?

Many resources contain unhelpful information such as "caution is recommended". Contact your clinical pharmacist or Drug Information (ext. 80900) with specific questions about drug use during breastfeeding.

Key prescribing points in breastfeeding women:

- avoid all non-essential drug therapy
- select drugs with the most safety data in humans
- feed baby just prior to drug dose
- monitor infant for adverse effects e.g. poor suckling (but recognise that these may be hard to detect)

BREASTFEEDING MOTHERS WANTED

We are looking for participants for a study on the safety of omeprazole in breastfeeding. Women who may be suitable would be healthy and weaning their baby from breast milk (two feeds/day or less). Participants will receive one dose of oral omeprazole and will have several samples of blood and milk taken. No samples are taken from the baby. If you are breastfeeding and would like to consider helping with this study please contact Judy via email: judy.dalrymple@cdhb.govt.nz or by telephone: 03 3640900 (Drug Information).