

but we don't share it. Nor is it consistent with the feedback we have received from family doctors. We have had inquiries since this article was published from doctors wanting to improve analgesia in their obstetric practices, including GP-anesthetists hoping to provide a service that is less labour intensive than an epidural service. I note that many communities our size and larger provide no obstetric analgesia service of any kind because of the onerous time commitments that the epidural service entails. In our experience this time-efficient procedure has allowed us to provide a comprehensive obstetric analgesia service, including ITN and occasional epidurals.

If this article has piqued the interest of any family doctors to consider providing ITN during labour, we are confident they will be able to perform the due diligence to safely implement the program. We believe that family medicine training in Canada is specifically designed to give our doctors the skills to start providing new services as they evolve. This is not to dismiss the complex infrastructure set up in all of our hospitals that supports and ensures the provision of safe services. These include, but are not limited to our hospital boards, medical advisory committees, risk management departments, obstetric service departments, capable nursing staff and managers, and hospital pharmacists.

—R.G. Minty MD FCFP

—Len Kelly MD MClInSc CCFP FCFP

—Alana Minty

—D.C. Hammett MD CCFP FRACGP

Sioux Lookout, Ont

by e-mail

Morphine in breast milk

I read in the January issue of *Canadian Family Physician* about the tragic death of the baby resulting from the breastfeeding mother taking acetaminophen and codeine.¹ "Following the development of poor neonatal feeding, the mother expressed milk and stored it in

a freezer. Analysis of the milk for morphine... revealed a concentration of 87 ng/mL.... The morphine measurement was further confirmed by gas chromatography-mass spectrometry."¹

I have 2 questions.

Question 1: At 87 ng/mL, 1000 mL of breast milk would contain a total of 87 µg of morphine. How can such a small quantity be toxic to a baby that drinks only 60-90 mL at a time?

Also, "mass spectrometry revealed a blood concentration of morphine at 70 ng/mL and acetaminophen at 5.9 µg/mL. Neonates receiving morphine for analgesia have been reported to have serum concentrations of morphine at 10 to 12 ng/mL."¹

Question 2: How can such small quantities of morphine in breast milk cause such high blood levels in the infant?

—Mitch Young MD

Manchester, NH

by e-mail

Reference

1. Madadi P, Koren G, Cairns J, Chitayat D, Gaedigk A, Leeder JS, et al. Safety of codeine during breastfeeding. Fatal morphine poisoning in the breastfed neonate of a mother prescribed codeine. *Can Fam Physician* 2007;53:33-5.

Response

We wish to thank Dr Young for his interest in our Motherisk Update, and for his thoughtful observations.

The dose of 87 µg/L of milk calculated by him is not "such a small quantity" for a newborn. In fact, it is 30 µg/kg. In older infants a dose of 50 µg/kg is used for sedation. The newborn has much lower capacity to deactivate morphine.¹ Moreover, the newborn has substantially higher sensitivity to the central effects of morphine, partially due to more penetration through the blood-brain barrier.²

Last, as we indicated in the paper, the homozygosity the child exhibited to glucuronidation of morphine

might be associated with higher levels of the morphine-6-glucuronide metabolite, which is many times more active than morphine. We have not measured this metabolite in milk, but we are now in the process of doing so.

With research support from Genome Canada, we are currently studying the prevalence and risk of codeine use while breastfeeding.

—Gideon Koren MD FRCPC
Director, Motherisk Program
Hospital for Sick Children
Toronto, Ont
—Parvaz Madadi
London, Ont
by e-mail

References

1. Bouwmeester NJ, Anderson BJ, Tibboel D, Holford NH. Developmental pharmacokinetics of morphine and its metabolites in neonates, infants and young children. *Br J Anaesth* 2004;92:208-17.
2. Rai A, Bhalla S, Rebello SS, Katrissios H, Gulati A. Disposition of morphine in plasma and cerebrospinal fluid varies during neonatal development in pigs. *J Pharm Pharmacol* 2005;57:981-6.

A gulf of difference

I have read with interest the article written by Dr I. Neil Grant which was published in the April 2007 issue

under the title "Listen to thy heart, and write" (*Can Fam Physician* 2007;53:702-3).

I noticed that Dr Grant made a mistake, which was also missed by *Canadian Family Physician*, by referring to the Arabian Gulf. The correct name is Persian Gulf.

—Kourosh Dinyari MD
Edmonton, Alta
by e-mail

Editor's note

Although the name Arabian Gulf is often used to refer to the body of water in question, the United Nations has confirmed that Persian Gulf is the official term to be used by members of the United Nations.

Correction

In the article "Diagnosing streptococcal sore throat in adults" in the April 2007 issue (*Can Fam Physician* 2007;53:666-71), one of the authors, Joseph Griffiths, was incorrectly listed as a PhD candidate holding an MSc degree. Mr Griffiths is currently a candidate for the MSc at the University of Waterloo in Ontario. *Canadian Family Physician* apologizes for this error.
