

Sugar Water for Immunization Pain Management: Too Much Sweet Stuff?

Dear Editor:

Sugar water (also referred to as sucrose solution) is being increasingly used by hospitals across Canada to manage pain in infants undergoing medical procedures involving needle pokes.¹ Recently, Toronto Public Health (TPH), in collaboration with The Hospital for Sick Children and the University of Toronto, produced a fact sheet for parents that includes sugar water as a strategy to reduce infant immunization injection pain in infants who are not breast-feeding. The fact sheet is titled: "How to reduce children's pain from immunization", and can be found at: http://www.toronto.ca/health/immunization_children/howtoreducepain.htm.

The inclusion of sugar water was based on extensive research evidence demonstrating analgesic benefit for immunization injections in infants up to 1 year of age² and the recommendation to use sugar water in an evidence-based clinical practice guideline about managing childhood vaccine injection pain.³ The exact mechanism of action of sugar water is unknown, but is postulated to involve aspects of distraction as well as endogenous opioid release through sweet taste receptors in the mouth.²

Concerns have been expressed about this recommendation with respect to the amount of sugar that infants may receive if sugar water is used to manage pain from all immunization injections performed in the first year of life. In order to address this concern, we compared the amount of sugar that infants would receive if sugar water were used to manage vaccine injection pain with the amount of sugar that infants would receive if given common medications, such as antibiotics or oral analgesics, which frequently contain sugar as an excipient (flavouring agent). We obtained information about the quantity of sugar in commercial products from our national prescribing reference, CPhA's* online *Compendium of Pharmaceuticals and Specialties* (CPS),⁴ and if not included in the CPS, from manufacturer representatives working in medical information departments.

For this comparison, we assumed that infants undergoing immunization injections would be given a single dose of 2 ml of 24% sugar water solution (wt/vol) orally to manage pain – which is equivalent to 0.48 grams of sucrose.² We found that the single dose of sugar ingested as a by-product of using common medications was similar to or higher than the dose ingested when used for analgesia. In fact, some medications exposed infants to more than 5 times the amount of sugar they would receive for pain management (see Table 1 for example). These findings suggest that the amount of sucrose that infants are exposed to for pain reduction during immunization injections is not clinically important.

At present, there is no commercially available sugar water product for sale to the public in Canada. The fact sheet therefore pro-

Table 1. Example of Sucrose Exposure as a By-product of Medication Use in Infants

| | 5 kg Infant (2 months old) | 8 kg Infant (6 months old) | 10 kg Infant (12 months old) |
|--|-------------------------------|-------------------------------|---------------------------------|
| Usual Ceftin™ (25 mg/ml) single dose* | 3 ml | 5 ml | 6 ml |
| Sucrose dose ingested as a by-product of Ceftin™ use (g)† | 1.8 g | 3 g | 3.6 g |

* Usual dose, as reported by manufacturer, for otitis media and skin structure infections is 15 mg/kg twice daily. As reported by manufacturer in the CPS. Sugar concentration reported by manufacturer = 0.6 g/ml.
† Analgesic dose of sucrose is approximately 0.5 g

vides instructions to parents and health care providers on how to make sugar water. The fact sheet states that sugar water can be made by mixing one packet or cube of sugar (equal to one teaspoon of sugar) with 2 teaspoons (10 ml) of water. The sugar water can be fed to the infant using a syringe, spoon or pacifier immediately before vaccine injection.

The reader is referred to the clinical practice guideline for additional evidence-based strategies for reducing childhood vaccine injection pain.³

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4. *Compendium of Pharmaceuticals and Specialties*, online version (e-CPS). © Canadian Pharmacists Association, 2010. Ceftin™ monograph.

* CPhA = Canadian Pharmacists Association