Can active surveillance provide a rapid response to an emerging child health issue? The melamine example

D Grenier MD FRCPC1,2, A-M Ugnat PhD3, C McCourt MD FRCPC3, J Scott MD FRCPC4, M Laffin Thibodeau BCom1, MA Davis MBA1, NP Dickson MD5

In mid-September 2008, the federal government became aware of an outbreak of renal disease (renal stones and/or acute renal failure) in very young children in China, associated with consumption of powdered infant formula that was adulterated with melamine. Thousands of children in China were hospitalized, and several died (1). Melamine contamination was also found in other Chinese products that had a milk component, such as candies and coffee drinks.

Some Chinese milk-derived products sold in Canada were found to contain low levels of melamine and were recalled from the market (2). Infant formula manufactured in China is not approved for sale in Canada, and the manufacturers of infant formula sold in Canada do not use any milk ingredients originating in China. Therefore, the likelihood of Canadian infants being exposed to the formula that was affecting so many children in China was very low. Nevertheless, in light of patterns of international travel, adoption and immigration, there was a possibility that infants in Canada might be affected. Working in concert with Health Canada and the Canadian Food Inspection Agency, the Public Health Agency of Canada (PHAC) provided information for health care professionals and the public on this issue (3,4). The PHAC also endeavoured to determine whether there were cases of renal illness in Canadian children that may have been caused by the milk formula contamination in China.

The data in national hospitalization databases are not timely enough to meet this type of health surveillance need. Therefore, as a first step in the identification of possible melamine-associated illness in Canada, the PHAC asked paediatric hospital emergency departments, Paediatric Chairs, Paediatric Surgical Chiefs of Canada and members of the Canadian Association of Paediatric Health Centres to report any recent increases or unusual patterns of renal illness, in particular urinary calculi or renal failure, in infants or very young children seen in their institutions. The PHAC followed this inquiry, which had no positive reports, with a request to the Canadian Paediatric Surveillance Program (CPSP) to conduct an emergency one-time survey on the issue. It is this process that is the subject of the present article.

RESULTS OF THE CPSP

The response rate was 42%. No cases of melamine-associated renal disease were reported by the 1153 respondents. Twelve cases of renal stones were reported, and one of these cases also had acute renal failure. The majority of children had urinary tract infections (n=7). Other associated factors included hydronephrosis, diuretic therapy, hyperparathyroidism and prematurity. Hypercalciuria was present in seven cases and hyperoxaluria in one case. Interestingly, almost 10% of respondents mentioned that parental concerns about contaminated milk products were voiced to them, especially to those who worked in international adoption clinics.
CPSH Highlights

Survey
Renal stones and/or unexplained acute renal failure in infants

Is melamine contamination an issue in Canadian infants?

Currently, there is an outbreak of renal stones and renal failure in young children in China associated with consumption of milk formula contaminated with melamine. Other dairy products, such as frozen yogurts, chocolates, cookies and tofu cubes, made in China and exported to other countries have been found to contain melamine. Infant formula manufactured in China is not approved for sale in Canada. Health Canada has confirmed with the four major manufacturers of infant formulas sold in Canada that they do not use any milk ingredients that come from China.

The Public Health Agency of Canada has commissioned this survey to assess if any presentations of renal stones and/or acute renal failure in Canadian children may have been caused by a melamine contamination.

1. Over the past 12 months:
   1. Have parents consulted you about possible milk products contamination? Yes ___ No ___
   2. Have you seen any infants (less than one year) with renal stones and/or unexplained acute renal failure? Yes ___ No ___
   If no, we thank you for participating in this survey.

2. If yes, how many cases in infants? Renal stones _____ Unexplained acute renal failure _____ Both _____

3. What do you feel was the most likely cause of the infant's renal stones and/or acute renal failure?

4. Date of birth (day/month/year) ______________ Sex ___ Age at presentation: ___ weeks ___ months

5. What are the symptoms the infant exhibited?

6. Child’s ethnicity (check all that apply): Aboriginal ___ Black ___ Caucasian ___ Asian ___, specify _________________________ Other, specify _____________________________

7. Any evidence of known causes of stones: Hypercalciuria ___ Hyperoxaluria ___ Extreme prematurity ___ Other causes: _____

8. Any evidence of urinary tract infection? Yes ___ No ___

9. Other causes: Results of abdominal ultrasounds: ____________ Results of other imaging: ____________

10. Any evidence of known cause of stone: Cystinuria ___ Hyperuricosuria ___ Other causes: _____

11. Any family history of renal stones: Yes ___ No ___

12. Is melamine consumption linked to the diagnosis? Yes ___ No ___

13. What do you feel was the most likely cause of the infant’s renal stones and/or acute renal failure?

Please return this survey as soon as possible in the enclosed postage-paid envelope. Thank you for your participation.

REFERENCES