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Urinary lithiasis outbreak among children in China linked with melamine, September-November 2008

1. INTRODUCTION

Since 11th of September 2008, Chinese authorities have offered screening for children less than 3 years-old who consumed milk contaminated with melamine for urinary lithiasis and provided free treatment for cases.

Milk products from Sanlu branch were withdrawn from sale in China on September 11. Milk products from other producers were withdrawn on 16th of September.

A surveillance system to detect cases has been set up by Chinese authorities since 11th of September. Although cases of urinary lithiasis linked to contaminated milk with melamine were first notified by Nanjing hospital in March 2008, no surveillance data were available before September 12.

2. EPIDEMIOLOGICAL SITUATION (05/11/08)

Cases have been described mainly in continental China. Several urinary lithiasis cases were also reported among children aged above 3 years in two special administrative regions of China: Hong Kong and Macao.

2.1 EPIDEMIOLOGICAL SITUATION IN CONTINENTAL CHINA

To date, no official outbreak report including total number of cases diagnosed, hospitalization status, age distribution of the cases and epidemic curve of this outbreak in China is available. Data released so far is presented in the figures and tables below.

- ***Age distribution (to 28/09/2008 – source: Chinese authorities)***
  - 99,2% of the cases diagnosed among children less than 3 years-old;
  - 0,8% were diagnosed among children aged between 3 and 4 ;
  - in continental China no case was diagnosed in children aged above 4 years;
  - 3 deaths associated with this outbreak were officially reported;
  - Data to 29 October, 2008 on outbreak evolution provided by the Ministry of Health (MoH) in China are presented in Table 3 and figures 1-6.

Outbreak progression

- The rapid increase in numbers of reported cases (suspect or confirmed) and cases hospitalised for urinary lithiasis linked with melamine in mid September is probably linked to an important public information campaign. The retrospective part in collected surveillance data is unknown.
- The number of symptomatic and confirmed cases of urinary lithiasis increased rapidly between September 16 and 21 (Figures 1-2). Available data in September 2008 showed a four- to five-fold difference between the number of suspect cases and that of confirmed cases of urinary lithiasis (Figures 3-4). On 21st of September 2008, 14,471 suspect cases of urinary lithiasis were hospitalized (cumulative number) while 54,439 children were diagnosed with symptoms. (Table3).
- The increase in the cumulative number of hospital admissions for urinary lithiasis slowed down around 15th of October (49,427 cases) (Figure 5).
- The number of cases discharged from hospital increased sharply between 21st of September and 7th of October 2008 (Figure 6).

2.2 EPIDEMIOLOGICAL SITUATION IN HONG KONG SAR

- On November 4, 2008, 10 cases of urinary lithiasis among children were reported to the Hong Kong Health Department.
- Among these 10 cases :
  - ✓ The youngest was 22 months-old;
  - ✓ 2 cases were 10 years-old;
  - ✓ The last reported case was reported at the beginning of October;
  - ✓ 3 of theses cases were residents of Continental China;
  - ✓ 2 cases had two lithiasis;
  - ✓ 1 lithiasis was eliminated spontaneously in one case;
  - ✓ 1 case was treated by lithotripsy.

Table 1: Number of urinary lithiasis cases associated with melamine consumption among children, Hong Kong, to November 4, 2008.
(Source: Hong Kong Department of Health).

Age	N case	With clinical symptoms
< 3 y.o	3	1
3-5 y.o	2	0
8 y.o	2	1
9 y.o	1	0
10 y.o	2	1
Total	10	3

2.2 EPIDEMIOLOGICAL SITUATION IN MACAO SAR

- Since September 2008, the health authorities in Macao have offered urinary lithiasis screening for children up to primary school.
- To October 21, 2008:
  - ✓ One case of urinary lithiasis was diagnosed in a one year-old baby in Macao.

- ✓ 16,490 nursery and primary school age children (over 3 years-old) were screened and 6 cases were reported.

Table 2 Number of urinary lithiasis cases associated with melamine consumption among children, Macao, to November 4, 2008 (Source: Health office of Macao).

Age	N cases	With clinical symptoms
< 3 y.o	1	-
3-5 y.o	2	0
8 y.o	2	0
9 y.o	1	0
10 y.o	1	1
Total	7	1

COMMENTS

Unofficial sources of information mention that urinary lithiasis cases among children have been diagnosed in China for several years although no causative link can retrospectively be established with melamine consumption. The first urinary lithiasis cases associated with melamine consumption were diagnosed several months ago. The sharp increase in the number of urinary lithiasis cases observed around mid-September is probably linked to the public information campaign, the important media coverage and the surveillance system implemented by health authorities for children aged below 3.

Over 50,000 hospitalized cases have since been reported by the surveillance system implemented in continental China.

There is, however, an important surveillance bias as the cost for screening of children aged over 3 years must be paid by their family. For financial reasons, cases in children aged over 3 years from low-income families could have been missed by the screening system. Low-income families were also the ones mostly using milk products from companies involved in the melamine crisis.

Furthermore, in September 2008, at least one diagnosed case in four was hospitalised in continental China.

Finally, a high proportion of urinary lithiasis cases could have remained asymptomatic, as suggested by the Hong Kong and Macao results.

Therefore, hospital admissions data for melamine-linked urinary lithiasis in children provided by the Chinese authorities only partially reflect the true epidemic, especially among children over 3 years-old in continental China.

The analysis of available data suggests that the epidemic peak of urinary lithiasis cases associated with melamine consumption is behind us, in part due to implementation of screening, the information campaign and control measures (milk products withdrawn from sale) implemented around mid September 2008.

Scientific data regarding the long-term evolution of urinary lithiasis are not available. Small-size lithiases will be eliminated spontaneously without causing symptoms. Other lithiases of greater diameter could lead to complications.

Cases should therefore still be diagnosed in China during the next weeks or months but probably in lower number. These cases will occur in children with urinary lithiasis linked with past melamine consumption who will later become symptomatic.

Table 3: Number of urinary lithiasis cases associated with melamine consumption among children, continental China, to 29th of October 2008 (Source : Ministry of Health, China).

Date	Cumulative number of symptomatic cases	Cumulative number of Urinary lithiasis cases (confirmed)	Hospitalized Cases (one given day)	Hospitalized severe cases (one given day)	Cumulative number of Hospitalised Admissions	Cumulative number of Hospitalised discharge
9/9	ND*	14	ND	ND	ND	ND
12/9	ND	432	ND	ND	ND	ND
15/9	1 253	ND	340	53	ND	ND
17/9	6 247	ND	1 327	64	1 421	94
21/9	54 439	ND	12 892	104	14 471	1 579
8/10	ND	ND	10 666	8	46 810	36 144
15/10	ND	ND	5 824	6	49 427	43 603
22/10	ND	ND	3 654	3	50 371	46 717
29/10	ND	ND	2 390	1	50 904	48 145

**ND: no data available.*

The following curves have reconstructed using available data from MoH China and should be viewed with caution.

Figure 1: Cumulative number of symptomatic cases (suspect or confirmed) of urinary lithiasis linked to melamine among children, China, 2008 (Source: MoH).

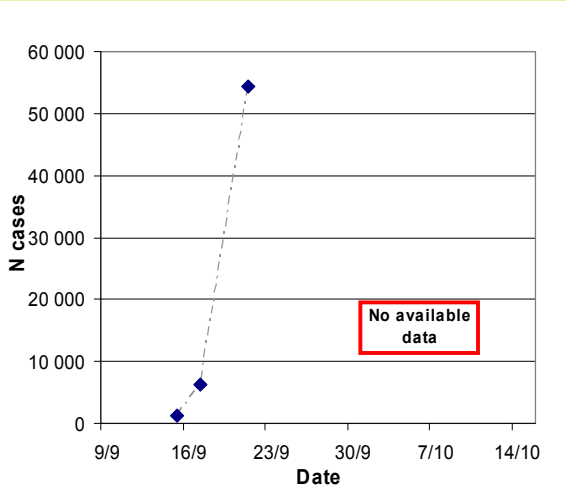

Figure 2: Cumulative number of confirmed cases of urinary lithiasis linked to melamine among children, China, 2008 (Source: MoH).

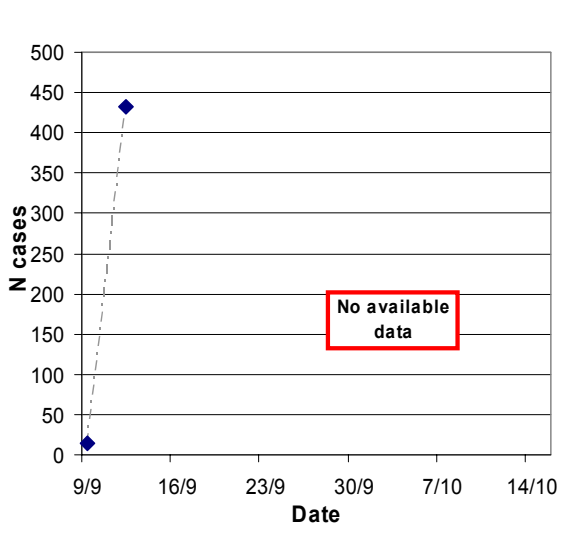

Figure 3: Number of suspect cases of urinary lithiasis linked to melamine hospitalized on a given day among children, China, 2008 (Source: MoH).

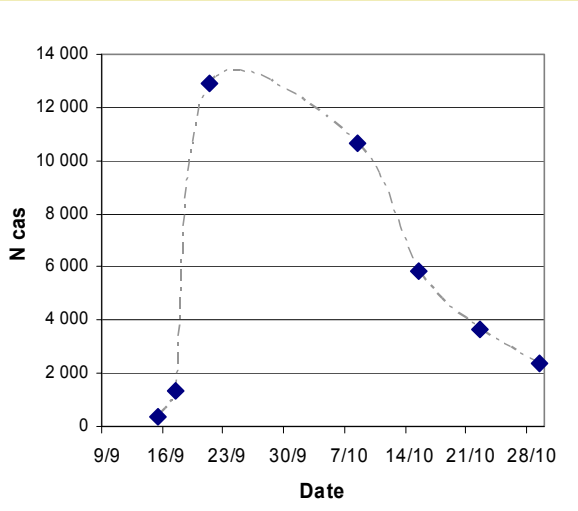

Figure 4: Number of severe cases of urinary lithiasis linked to melamine among children, hospitalized on a given day, China, 2008 (Source: MoH).

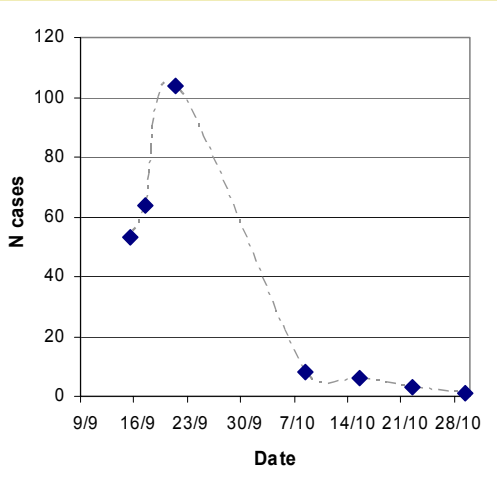

Figure 5: Cumulative number of admission to hospital for urinary lithiasis linked to melamine among children, China, 2008 (Source: MoH).

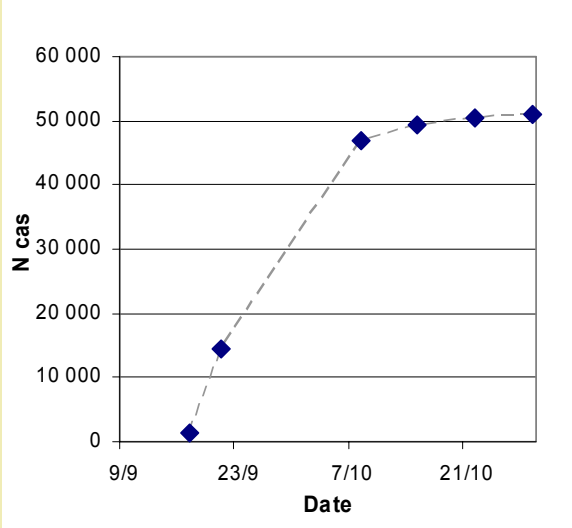

Figure 6: Cumulative number of suspect cases of urinary lithiasis linked to melamine among children hospital discharge, China, 2008 (Source: MoH).