WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Healthcare & Nutrition

231, de Saram Place, Colombo 01000, Sri Lanka.

Tele:(+94-011)2695112, 681548, 4740490, 4740492, 2677600 Fax: 2696583

Epidemiologist:(+94-011) 4740491, E-mail:chepid@sltnet.lk, epidunit@sltnet.lk

Web: www.epid.gov.lk

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WER SRI LANKA 2008

Melamine contamination - Part II

Part I of this article was published in the last issue of the Weekly Epidemiological Report.

Carcinogenicity

The International Agency for Research on Cancer (IARC) has concluded that there is sufficient evidence in experimental animals for the carcinogenicity of melamine under conditions in which it produces bladder stones. There is inadequate evidence for carcinogenicity in humans.

Role of melamine in the formation of kidney stones

Animal data have not shown that melamine alone causes renal failure or the formation of kidney stones. Evidence from an earlier outbreak of acute renal failure in cats and dogs associated with contaminated pet food suggests that a combination of melamine and cyanuric acid does cause renal toxicity. Both these compounds were found in the pet food together with other triazine compounds. Subsequent experimental studies in animals have shown that when they are fed a mixture of melamine and cyanuric acid this causes the formation of crystals in the tubules of the kidneys, eventually blocking them and causing renal damage and renal failure. The source of cyanuric acid in pet food was unknown but it may have been present as a contaminant of the melamine that had been illegally added to wheat gluten used in formulating pet food. In the current event in China, the presence of cyanuric acid has not yet been confirmed.

Health-based Guidance Values

Following the pet food incident in 2007 described above, several authorities have preformed preliminary risk assessments.

The US FDA has published an interim safety/ risk assessment on melamine and structural analogues and has established for melamine a tolerable daily intake TDI of 0.63 mg per kg of body weight per day.

The European Food Safety Authority has published a provisional statement and recommended to apply a TDI of 0.5 mg per kg of body weight per day as tolerable intake value for melamine.

Epidemiology and treatment

Suggested surveillance case definition

Identification of possible cases related to the consumption of melamine-contaminated products from China

Member States should be aware of the possible distribution of the contaminated products either through formal or informal channels, because of the large quantities involved and the seriousness of public health consequences of this event. The period of production of contaminated product is uncertain and the incriminated raw material and products may have been exported as infant formula or other milk containing products to other Member States. Therefore WHO is suggesting this surveillance case definition to Member States to increase their awareness of signs that their population may be affected.

Clinical description

The following symptoms have been observed in infants affected by the melamine-contaminated infant formula in China:

Contents ***Page***

- Unexplained crying in infants, especially when urinating, possible vomiting
- Macroscopic or microscopic haematuria
- Acute obstructive renal failure: oliguria or anuria
- Stones discharged while passing urine.

For example, a baby boy with urethral obstruction with stones normally has dysuria High blood pressure, edema, painful when knocked on kidney area

Key diagnostic criteria

1. Been fed with melamine-contaminated infant milk formula
2. Having one or more of the above clinical manifestations
3. Laboratory test results: routine urine tests with macroscopic or microscopic haematuria; blood biochemistry; liver and kidney function tests; urine calcium/creatinine ratio (usually normal); urinary red blood cell morphology shows normal morphology of red blood cells (not glomerular haematuria); parathyroid hormone test (usually normal).
4. Imaging examination: preferably ultrasound B exam of urinary system. If necessary, abdominal CT scan and intravenous urography (not to be used in case of anuria or renal failure). Kidney radionuclide scans can be used where available to evaluate renal function.
5. Ultrasound examination features:

General features: bilateral renal enlargement; increased echo on solid tissue; normal parenchyma thickness; slight pyelectasia and calicectasis; blunt renal calyx. If the obstruction locates in the ureter, then the ureter above the obstruction point dilates. Some cases have oedema with perinephric fat and soft tissue around the ureter. As the disease develops, the renal pelvis and ureter wall may have secondary oedema. A few cases have ascites.

Stone features: most stones affect the collecting system and ureters on both sides. Ureteral stones are mostly at pelviureteral junction, the part where the ureter passes across iliac artery, and ureter-bladder junction. Stones stay collectively, covering massive areas. Lighter echo in the background. Most stones are different from the calcium oxalate stones. Urinary tract is mostly completely obstructed by stones.

Differential diagnosis

1. Haematuria differentiation: need to rule out glomerular haematuria.

.2. Stone differentiation: stones are normally radiolucent and have a negative image on urinary tract x-ray. This feature differentiates the stones from those of radiopaque stones of calcium oxalate and calcium phosphate.

3. Differentiation of acute renal failure: need to rule out prerenal and renal failure.

Clinical treatment

1. Immediately stop using melamine-contaminated infant formula milk powder.
2. Medical treatment: use infusion and urine alkalinization to dispel the stones. Correct the water, electrolyte and acid-base imbalance. Closely monitor routine urine tests, blood biochemistry, renal functions, ultrasound findings (with particular attention to the renal pelvis, ureter expansion, and the change of the stones in shape and location). If the stones are loose and sand-like, they are very likely to be passed out with urine.
3. Treatment of complicated acute renal failure: priority should be given to the treatment of life-threatening complications such as hyperkalemia. Measures include the administration of sodium bicarbonate and insulin. If possible, blood dialysis and peritoneal dialysis can be used early. Surgical measures can be taken to remove the obstruction if necessary. Surgical treatment: if medical treatment is not effective, and hydrocele and kidney damage present, or blood dialysis and peritoneal dialysis are not available in case of renal failure, surgical methods can be considered to remove the obstruction. Stones can be removed by different methods including cystoscope retrograde intubation into the ureter, percutaneous kidney drainage, surgical removal and percutaneous kidney stone removal. Extracorporeal shock wave lithotripter (ESWL) is greatly limited in its application, because the stones are loose and mainly composed of ureter, and the patients are infants

Follow-up

Once the urinary obstruction is relieved, and the general condition and renal function and urination are back to normal, the children can be discharged.

Key issues to follow-up

Urine routine tests; ultrasound of urinary system; renal function tests; IVP (intravenous pyelogram) if necessary.

Sources

1. WHO Fact Sheet on Food safety –Melamine contamination event China [www.who.int/foodsafety/fs_management/infosan_events/en/ index.html]

2. WHO Fact Sheet on Food safety –Melamine contamination [www.who.int/ foodsafety/fs_management/infosan_events/en/ index1.html]

3. WHO Fact Sheet on Food safety – Epidemiology and treatment [www.who.int/foodsafety/fs_management/infosan_events/en/ index3.html]

4. WHO Fact Sheet on Food safety - Toxicology of melamine [http://www.who.int/foodsafety/fs_management/infosan_events/en/ index2.html]

Table 1: Vaccine-preventable Diseases & AFP

27th Sep - 3rd Oct 2008 (40th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 KD=1	01 GL=1	00	00	00	00	01 BD=1	00	03	01	79	64	+23.4%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	01 JF=1	00	00	00	00	00	01	01	96	64	+50.0%
Tetanus	01 GM=1	00	02 HB=2	00	00	00	00	00	00	03	01	31	28	+10.7%
Whooping Cough	01 CO=1	01 KD=1	00	00	00	00	00	00	00	02	02	41	34	+20.6%
Tuberculosis	99	01	20	15	16	00	`00	06	09	166	268	6674	7873	-15.4%

Table 2: Newly Introduced Notifiable Diseases

27th Sep - 3rd Oct 2008 (40th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Chicken-pox	19	18	12	00	03	03	03	08	20	86	85	4244	2659	+59.6%
Meningitis	03 KL=1 GM=2	00	05 HA=1 MT=1 GL=3	00	01 BT=1	03 KR=3	00	00	02 RP=1 KG=1	15	30	1033	504	+104.9%
Mumps	00	05	03	01	00	04	02	09	02	26	81	2312	1660	+39.3%

Key to Table 1 & 2

Provinces: W=Western, C=Central, S=Southern, N=North, E= East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions: CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Killinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttalam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

Table 3: Laboratory Surveillance of Dengue Fever 27th Sep - 3rd Oct 2008 (40th Week)

Samples	Number tested		Number positive *		Serotypes									
					D_1		D_2		D_3		D_4		Negative	
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH
Number for current week	00	02	00	00	00	00	00	00	00	00	00	00	00	00
Total number to date in 2008	124	138	09	23	00	00	06	08	01	08	00	00	02	00

Sources: Genetech Molecular Diagnostics & School of Gene Technology, Colombo [GT] and Genetic Laboratory Asiri Surgical Hospital [AH]
* Not all positives are subjected to serotyping.
NA= Not Available.

Data Sources:
Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephali - tis, Chickenpox, Meningitis, Mumps.
Special Surveillance: Acute Flaccid Paralysis.

Table 4: Selected notifiable diseases reported by Medical Officers of Health

27th Sep- 3rd Oct 2008 (40th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephal -itis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Human-Rabies		Re-turns Re-ceived
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	23	1346	05	211	00	14	05	113	02	90	31	776	01	03	01	94	00	00	**77**
Gampaha	07	821	02	171	01	19	02	47	02	100	22	634	00	07	10	148	01	06	**79**
Kalutara	06	405	02	258	00	11	00	57	00	20	15	488	00	03	00	39	00	02	**100**
Kandy	05	225	05	251	00	07	03	54	02	90	15	385	00	87	03	111	00	02	**76**
Matale	05	126	01	176	00	04	01	43	03	13	04	653	00	02	00	25	00	00	**92**
Nuwara	00	24	05	221	00	03	02	227	00	166	01	48	00	36	01	100	00	01	**85**
Galle	01	91	06	157	02	17	00	16	00	43	25	330	00	13	00	08	00	03	**88**
Hambantota	00	85	01	88	00	05	00	07	00	12	04	89	02	79	00	14	00	01	**91**
Matara	07	265	06	175	00	13	00	35	00	06	19	401	04	196	00	14	00	01	**82**
Jaffna	01	54	08	135	00	04	04	238	01	16	00	00	00	151	00	35	00	00	**63**
Kilinochchi	00	00	00	35	00	00	00	01	00	04	00	02	00	00	00	01	00	00	**00**
Mannar	00	25	01	21	00	06	00	155	00	00	00	00	00	01	00	14	00	00	**25**
Vavuniya	01	12	01	57	00	02	01	13	00	19	00	05	00	01	00	05	00	00	**100**
Mullaitivu	00	00	00	11	00	00	00	13	00	13	00	00	00	01	00	09	00	00	**00**
Batticaloa	00	85	00	121	01	07	00	21	00	26	00	08	00	01	01	88	01	07	**64**
Ampara	00	30	00	247	00	00	00	07	00	283	00	22	00	00	01	11	00	00	**14**
Trincomalee	00	177	00	92	00	01	00	13	00	14	00	30	00	16	00	13	00	00	**30**
Kurunegala	03	296	04	193	00	14	00	51	00	23	19	579	00	27	00	64	00	07	**74**
Puttalam	00	276	00	84	00	08	00	147	00	26	00	57	00	37	00	29	00	04	**67**
Anuradhapu	01	117	02	94	01	10	00	12	00	09	01	236	00	11	00	13	00	03	**79**
Polonnaruw	00	62	01	116	00	01	00	21	00	21	00	59	00	01	00	19	00	00	**86**
Badulla	00	81	07	406	00	05	02	118	00	95	00	56	02	105	02	131	00	01	**73**
Monaragala	00	52	19	318	00	03	00	36	01	117	00	90	02	95	00	44	00	00	**82**
Ratnapura	03	245	06	328	00	32	00	47	00	68	06	168	00	78	00	48	00	00	**83**
Kegalle	12	377	03	267	01	26	05	67	00	11	33	420	01	61	08	473	00	01	**100**
Kalmunai	00	35	02	240	00	02	00	09	00	16	01	03	00	03	01	24	00	00	**77**
SRI LANKA	**75**	**5312**	**87**	**4473**	**06**	**214**	**25**	**1568**	**11**	**1301**	**196**	**5536**	**12**	**1015**	**28**	**1574**	**02**	**39**	**75**

Source: Weekly Returns of Communicable Diseases (WRCD).

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever.

****Timely** refers to returns received on or before 11October, 2008 Total number of reporting units =238. Number of reporting units data provided for the current week: 227

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ON STATE SERVICE

Dr. M. R. N. ABEYSINGHE
EPIDEMIOLOGIST
EPIDEMIOLOGICAL UNIT
231, DE SARAM PLACE
COLOMBO 10