



WEEKLY EPIDEMIOLOGICAL REPORT

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Arsenic In Drinking Water

A 'National Poisons Prevention Week' was announced from the 14th to 20th May, 2007 with the theme 'Let Us Prevent Poisoning.' The intension is to reduce the burden of death and disease due to poisoning in the country by raising awareness about the matter. We publish this article on 'Arsenic in drinking water', which is an emerging problem in some parts of the region, to mark this event.

Arsenic is found in water which has flowed through arsenic-rich rocks. Severe health effects have been observed in populations drinking arsenic-rich water over long periods in countries worldwide. Reliable data on exposure and health effects are rarely available, but it is clear that there are many countries in the world where arsenic in drinking-water has been detected at concentration greater than the Guideline Value, 0.01 mg/L, or the respective national standard. These include Argentina, Australia, Bangladesh, Chile, China, Hungary, India, Mexico, Peru, Thailand and the United States of America. Countries where adverse health effects have been documented include Bangladesh, China, India (West Bengal) and the United States of America.

In Bangladesh, West Bengal (India) and some other areas, most drinking-water used to be collected from open dug wells and ponds with little or no arsenic, but with contaminated water transmitting diseases such as diarrhoea, dysentery, typhoid, cholera and hepatitis. Programmes to provide 'safe' drinking-water over the past 30 years have helped to control these diseases, but in some areas they have had the unexpected side-effect of exposing the population to another health problem - arsenic.

Arsenic in drinking-water in Bangladesh is attracting much attention for a number of reasons. It is a new, unfamiliar problem to the population, including concerned professionals. There are millions of people who may be affected by drinking arsenic-rich water. Last but not least among them is the fear for future adverse health effects as a result of water already consumed.

The most commonly manifested disease so far in Bangladesh is skin lesions. Over the next decade, skin and internal cancers are likely to become the principal human health concern arising from arsenic. According to one estimate, at least 100,000 cases of skin lesions caused by arsenic have occurred and there may be many more.

The number of people drinking arsenic-rich water in Bangladesh has increased dramatically since the 1970s due to well-drilling and population growth. The impact of arsenic extends from immediate health effects to extensive social and economic hardships that affect especially the poor. Costs of health care and inability of affected persons to engage in productive activities are important factors in this regard.

The most important remedial action is prevention of further exposure by providing safe drinking-water. The cost and difficulty of reducing arsenic in drinking-water increases as the targeted concentration lowers. It varies with the arsenic concentration in the source water, the chemical matrix of the water including interfering solutes, availability of alternative sources of low arsenic water, mitigation

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technologies and the amount of water to be treated.

Control of arsenic is more complex where drinking-water is obtained from many individual sources (such as hand-pumps and wells) as is common in rural areas of Bangladesh and India. Low arsenic water is only needed for drinking and cooking. Arsenic-rich water can be used safely for laundry and bathing. Discrimination between high-arsenic and low-arsenic sources by painting the hand-pumps (e.g. red and

green) can be an effective and low cost means to rapidly reduce exposure to arsenic when accompanied by effective health education.

Alternative low-arsenic sources such as rain water and treated surface water may be available and appropriate in some circumstances. Where low arsenic water is not available, it is necessary to remove arsenic from drinking-water.

Outbreak of Blister Beetle Dermatitis in Ambalangoda

An outbreak of painful dermatitis was reported to the regional health authorities during the current week in the Ambalangoda Medical Officer of Health (MOH) area. The cases were mainly reported from the 2 tsunami resettlement villages of Kobeithuduwa and Dalukanda.

During the epidemiological investigation carried out by the public health team led by the Regional Epidemiologist for Galle, 65 patients were identified from Kobeithuduwa (including at least one from each family) and a further 20 from Dalukanda. A few patients were then referred to the Consultant Dermatologist of the Karapitiya Teaching Hospital for diagnosis and management. A diagnosis of Blister Beetle Dermatitis was made based on the clinical features.

The affected localities are both rural villages in Ambalangoda and are surrounded by shrub jungles and cinnamon cultivations. The current outbreak has been reported shortly after the recent heavy rains. The cases, first notified on the 19th of May, had increased gradually during the subsequent days. The cases comprised of men, women and children. The affected people were treated with antibiotics and topical steroids. Health education advice on the measures to be adopted for the prevention of further cases were given to the people of the 2 villages. Local health authorities were educated about the outbreak.

The 'Blister Beetle' belongs to the Coleoptera family *Meloidae*. There are approximately 2,500 known species worldwide. Blister beetle causes skin lesions by direct contact. They are found on various continents.

They contain highly poisonous substances such as cantharidin or pederin. Cantharidin is found in the haemolymph of the beetle and is released when the insect is crushed, causing blistering of the skin. A number of insects secrete the caustic fluid via their leg joints when they are disturbed ('reflex bleeding'). Cantharidin is used medically to remove warts, and is collected for this purpose from species of the genera *Mylabris* and *Lytta*, especially *Lytta vesicatoria*, better known as 'Spanish fly'.

Blister beetles are hypermetamorphic, going through several larval stages, the first of which is typically a triungulin. The larvae are insectivorous, mainly attacking bees, though a few feed on grasshopper eggs. The adults feed on flowers and leaves of plants.

Figure: Black Blister Beetle



On skin contact with cantharidin-containing blister beetles, local tissue irritation occurs after a few hours. This results from the disruption of tonofilaments in the desmosomes with acantholysis and intra-epidermal blister formation. Redness, oedema and vesicles can appear on the skin. Sometimes there are 'kissing lesions' on the elbow or in the hollow of the knee.

In contrast, the effect of pederin is not immediately noticeable and only becomes apparent after 1 to 2 days. The erythema is much more severe and can persist for months. On contact with the conjunctiva and/or cornea, *Paederus* species cause 'Nairobi eye'. This is associated with extensive painful peri-orbital swelling and purulent conjunctivitis. Corneal erosions and blindness can follow.

For external lesions, the skin should be rinsed copiously as rapidly as possible. After disinfection, medical treatment is necessary. This may include the application of silver sulphadiazine cream, antibiotics and topical steroids. Skin lesions caused by cantharidin practically always heal without leaving scars. An eye that is affected should be rinsed copiously. Afterwards an antibiotic- and steroid-containing eye ointment should be applied under medical supervision.

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Table 1: Vaccine-preventable Diseases & AFP

12th - 18th May 2007 (20th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	02	34	54	-37.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	01 PU=1	00	00	00	01	01	29	08	+262.5%
Tetanus	00	00	00	00	00	00	00	00	00	01	13	24	-45.8%
Whooping Cough	00	00	00	00	00	00	00	00	00	03	17	35	-51.4%
Tuberculosis	66	51	07	08	30	00	20	17	199	160	3867	4208	-8.1%

Table 2: Diseases under Special Surveillance

12th - 18th May 2007 (20th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	20	04	02	02	08	03	01	07	47	108	1841	3754	-50.9%
Encephalitis	01 CB=1	01 ML=1	00	02 VA=1 BT=1	00	00	00	01 RP=1	05	01	90	51	+76.5%
Human Rabies	00	00	01 GL=1	00	00	00	00	00	01	00	26	24	+8.3%

Table 3: Newly Introduced Notifiable Diseases

12th - 18th May 2007 (20th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Total number of cases to date in 2007
	W	C	S	NE	NW	NC	U	Sab		
Chickenpox	11	09	12	12	09	05	03	09	70	1450
Meningitis	00	00	00	00	00	00	00	00	00	49
Mumps	23	03	04	07	06	01	01	05	50	530

*DF / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.
NA= Not Available.
Sources:
Weekly Return of Communicable Diseases:
Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.
Special Surveillance:
Acute Flaccid Paralysis.
National Control Program for Tuberculosis and Chest Diseases:
Tuberculosis.
Details by districts are given in Table 5.

Provinces:

W=Western, C=Central, S=Southern, NE=North & 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 4: Laboratory Surveillance of Dengue Fever

12th - 18th May 2007 (20th Week)

Samples	Number tested	Number positive *	Serotypes				
			D ₁	D ₂	D ₃	D ₄	Negative
Number for current week	21	00	00	00	00	00	00
Total number to date in 2007	272	15	00	05	04	00	05

Source: Genetech Molecular Diagnostics & School of Gene Technology, Colombo.

* Not all positives are subjected to serotyping.

Table 5: Selected notifiable diseases reported by Medical Officers of Health
12th - 18th May 2007 (20th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Colombo	12	507	22	106	01	04	01	33	00	42	00	59	00	01	01	16	92
Gampaha	05	200	05	94	00	11	01	32	00	28	00	117	00	06	00	41	57
Kalutara	03	136	18	142	00	01	02	25	01	13	02	56	00	01	00	31	100
Kandy	01	206	07	104	00	03	02	28	00	06	00	36	01	35	06	121	50
Matale	00	53	06	83	01	04	03	08	00	03	00	18	00	03	02	76	75
Nuwara Eliya	03	22	17	102	00	01	01	35	00	366	00	06	01	23	06	110	71
Galle	00	45	07	59	00	06	00	06	00	03	00	27	00	16	01	10	88
Hambantota	01	26	00	25	00	04	02	12	00	09	02	23	00	19	00	07	73
Matara	01	68	15	107	00	05	00	20	00	10	05	91	00	104	00	11	94
Jaffna	00	12	00	52	00	02	00	267	00	02	00	00	00	79	00	12	00
Kilinochchi	00	01	00	00	00	00	00	03	00	00	00	00	00	02	00	02	00
Mannar	00	07	00	11	00	00	00	38	00	00	00	00	00	00	00	05	25
Vavuniya	00	10	00	20	01	03	00	09	00	10	00	02	00	00	00	03	100
Mullaitivu	00	00	00	06	00	04	00	12	00	00	00	00	00	00	00	00	00
Batticaloa	02	34	19	269	01	08	00	12	00	02	00	00	00	00	27	196	64
Ampara	00	01	00	40	00	00	00	03	00	00	00	00	00	00	00	13	43
Trincomalee	00	36	17	80	00	01	00	11	00	22	00	02	00	02	03	36	44
Kurunegala	05	160	09	131	00	01	02	27	00	12	00	10	00	23	03	15	56
Puttalam	03	67	03	34	00	09	00	34	00	00	00	14	00	00	03	54	78
Anuradhapura	03	32	00	34	00	07	00	16	00	06	01	14	00	16	02	26	74
Polonnaruwa	00	32	01	44	00	02	00	04	00	01	00	16	00	00	00	11	57
Badulla	01	15	20	208	00	00	03	37	00	08	01	23	06	63	06	103	87
Monaragala	00	08	07	110	00	01	01	18	08	08	00	24	03	30	00	11	90
Ratnapura	03	83	06	253	01	09	01	33	00	07	00	24	00	06	00	37	50
Kegalle	04	78	10	95	00	04	00	24	00	04	03	44	00	10	02	25	64
Kalmunai	00	02	12	60	00	00	00	06	00	00	00	00	00	02	01	74	46
SRI LANKA	47	1841	201	2269	05	90	19	753	01	562	14	606	11	441	63	1046	66

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 26 May 2007. Total number of reporting units = 290. Number of reporting units data provided for the current week: 192.

A = Cases reported during the current week. B = Cumulative cases for the year.

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