



WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
Ministry of Health

231, de Saram Place, Colombo 01000, Sri Lanka
Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@slt.net.lk
Epidemiologist: +94 11 2681548, E mail: chepid@slt.net.lk
Web: <http://www.epid.gov.lk>

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Botulism

Overview

Human botulism is a serious, potentially fatal disease caused by *Clostridium botulinum*, which produces spores that are heat-resistant and exist widely in the environment, and in the absence of oxygen they germinate, grow and then excrete toxins. There are seven distinct forms of botulinum toxin, types A–G. Four of these (types A, B, E and rarely F) cause human botulism. Botulinum toxins are ingested through improperly processed food in which the bacteria or the spores survive and produce the toxins. Though mainly a foodborne intoxication, botulism can also be caused by intestinal infection in infants, wound infections and by inhalation.

Symptoms

Early symptoms are marked fatigue, weakness and vertigo, usually followed by blurred vision, dry mouth and difficulty in swallowing and speaking. Vomiting, diarrhoea, constipation and abdominal swelling may also occur. The disease can progress to weakness in the neck and arms, after which the respiratory muscles and muscles of the lower body are affected. The paralysis may make breathing difficult. There is no fever and no loss of consciousness.

The symptoms are not caused by the bacterium itself, but by the toxin produced by the bacterium. Symptoms usually appear within 12 to 36 hours (within a minimum and maximum range of four hours to eight days) after exposure. Incidence of botulism is low, but the mortality rate

can be high. The disease can be fatal in 5 to 10% of cases.

Foodborne botulism

Clostridium botulinum is an anaerobic bacterium, meaning it can only grow in the absence of oxygen. Foodborne botulism occurs when *Clostridium botulinum* grows and produces toxins in food prior to consumption. *Clostridium botulinum* produces spores and they exist widely in the environment including soil, river and sea water.

The botulinum toxin has been found in a variety of foods, including low-acid preserved vegetables, such as green beans, spinach, mushrooms, and beets; fish, including canned tuna, fermented, salted and smoked fish; and meat products, such as ham and sausage. Occasionally, commercially prepared foods are involved.

Though spores of *Clostridium botulinum* are heat-resistant, the toxin produced by bacteria growing out of the spores under anaerobic conditions is destroyed by boiling (for example, at internal temperature >85°C for five minutes or longer).

Food samples associated with suspect cases must be obtained immediately, stored in properly sealed containers, and sent to laboratories in order to identify the cause and to prevent further cases.

Infant botulism

Infant botulism occurs mostly in infants under six months of age. Different from foodborne botulism caused by ingestion of pre-formed toxins in

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food, it occurs when infants ingest *Clostridium botulinum* spores, which germinate into bacteria that colonize in the gut and release toxins.

Wound botulism

Wound botulism is rare and occurs when the spores get into an open wound and are able to reproduce in an anaerobic environment.

Inhalation botulism

Inhalation botulism is rare and does not occur naturally, i.e. it is associated with accidental or intentional (e.g. bioterrorism) events which result in release of the toxins in aerosols. Inhalation botulism exhibits a similar clinical footprint to foodborne botulism. The median lethal dose for humans has been estimated at two nanograms of botulinum toxin per kilogram of bodyweight, which is approximately three times greater than in foodborne cases.

Other types of intoxication

Waterborne botulism could theoretically result from the ingestion of the pre-formed toxin. However, as common water treatment processes (e.g. boiling, disinfection with 0.1% hypochlorite bleach solution) destroy the toxin, the risk is considered low.

Botulism of undetermined origin usually involves adult cases where no food or wound source can be identified.

Diagnosis and treatment

Diagnosis is usually based on clinical history and clinical examination followed by laboratory confirmation including demonstrating the presence of botulinum toxin in serum, stool or food, or a culture of *Clostridium botulinum* from stool, wound or food. Misdiagnosis of botulism sometimes occurs as it is often confused with stroke, Guillain-Barré syndrome or myasthenia gravis.

Antitoxin should be administered as soon as possible after a clinical diagnosis. Early administration is effective in reducing mortality rates.

Prevention

Prevention of foodborne botulism is based on good practice in food preparation particularly preservation and hygiene. Botulism may be prevented by the inactivation of the bacterial spores in heat-sterilized or canned products or by inhibiting bacterial growth in other products. Commercial heat pasteurization (vacuum packed pasteurized products, hot smoked products) may not be sufficient to kill all spores and therefore

the safety of these products must be based on preventing bacterial growth and toxin production. Refrigeration temperatures combined with salt content and/or acidic conditions will prevent the growth of the bacteria and formation of toxin.

The WHO Five Keys to Safer Food are;

- keep clean
- separate raw and cooked
- cook thoroughly
- keep food at safe temperatures
- use safe water and raw materials.

'Botox'

The bacterium *Clostridium botulinum* is the same bacterium that is used to produce Botox, a pharmaceutical product predominantly injected for clinical and cosmetic use. Botox treatments employ the purified and heavily diluted botulinum neurotoxin type A.

WHO's response

Botulism outbreaks are rare but are public health emergencies that require rapid recognition. WHO's role in responding to outbreaks of botulism that may be of international concern is as follows.

- Surveillance and detection
- Risk assessment: consideration of whether the outbreak is natural, accidental, or, possibly, intentional.
- Containment at the disease source: coordinates with national and local authorities in order to contain outbreaks at their source.
- Delivery of assistance: coordinates between international agencies, experts, national laboratories, airlines and commercial organizations to mobilize response equipment, materials and supplies, including the provision and administration of botulinum antitoxin.

Sources:

Botulism, available at <http://www.who.int/mediacentre/factsheets/fs270/en/>

Compiled by Dr. C U D Gunasekara of the Epidemiology Unit.

Table 1: Selected notifiable diseases reported by Medical Officers of Health 25th - 01st May 2015 (18th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmaniasis		WRCD	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**
Colombo	107	3847	3	76	0	4	3	32	4	55	7	105	0	4	0	16	0	3	7	214	1	16	0	0	81	19
Gampaha	22	1778	2	29	0	3	0	12	0	10	1	181	0	6	1	71	0	0	7	80	0	9	1	2	60	40
Kalutara	11	645	2	39	0	4	1	16	0	65	7	126	0	0	0	14	0	1	6	126	0	17	0	0	69	31
Kandy	13	580	2	50	0	5	1	15	1	25	3	30	2	29	1	69	0	0	2	96	1	7	0	1	87	13
Matale	1	301	0	21	0	0	0	4	0	3	0	20	0	4	0	18	0	0	0	7	0	3	0	3	31	69
Nuwareliya	2	82	7	121	1	2	0	9	0	0	0	10	1	31	2	39	0	0	4	33	0	25	0	0	69	31
Galle	0	283	0	24	0	0	0	2	0	6	0	55	0	22	0	4	0	0	0	60	0	13	0	0	0	100
Hambantota	1	143	0	11	0	0	0	4	0	7	1	35	0	21	2	19	0	0	3	52	0	4	1	103	75	25
Matara	3	199	3	32	0	3	0	4	0	44	1	76	0	17	1	15	0	0	10	104	1	10	1	25	100	0
Jaffna	6	999	10	252	0	8	2	132	0	33	1	11	4	480	0	7	0	1	5	97	0	6	0	0	92	8
Kilinochchi	0	32	2	38	0	0	0	5	0	26	0	1	0	9	0	0	0	0	0	11	0	0	0	0	25	75
Mannar	0	69	0	4	0	1	0	5	0	1	0	8	0	15	0	0	0	0	0	2	0	0	0	0	20	80
Vavuniya	0	59	0	10	0	4	0	27	0	3	0	10	0	11	0	1	0	2	0	32	0	3	0	2	0	100
Mullaitivu	0	71	1	11	0	2	1	5	0	1	0	3	0	6	0	2	0	0	0	1	0	2	0	3	60	40
Batticaloa	14	1030	1	110	0	4	0	12	1	100	0	2	0	0	0	0	0	0	0	18	0	10	0	0	71	29
Ampara	1	22	0	21	0	0	0	1	0	2	1	7	0	0	0	2	0	0	8	100	0	3	0	0	57	43
Trincomalee	12	379	0	18	0	0	0	17	0	25	0	11	2	6	0	6	0	1	3	36	1	3	0	1	58	42
Kurunegala	3	689	3	67	0	2	0	3	0	12	2	105	0	14	2	18	0	1	13	188	0	9	9	43	89	11
Puttalam	2	393	0	14	0	3	0	2	0	6	0	18	0	7	0	1	0	0	0	28	0	10	0	1	54	46
Anuradhapura	1	244	2	26	0	1	0	2	0	48	3	122	0	15	0	8	0	0	2	84	0	12	6	102	58	42
Polonnaruwa	0	117	0	24	0	2	0	7	0	3	0	42	0	1	0	3	0	0	5	68	0	12	1	44	29	71
Badulla	3	318	0	52	0	3	1	4	0	6	0	27	1	47	2	69	0	2	3	58	4	32	0	6	65	35
Monaragala	1	98	2	43	0	1	0	9	0	2	2	112	1	32	1	30	0	1	1	37	1	6	0	11	73	27
Ratnapura	5	439	1	111	1	4	0	22	0	1	1	113	0	26	0	120	0	0	0	46	0	17	0	4	39	61
Kegalle	5	241	1	33	0	7	0	35	1	4	5	113	2	24	2	50	0	0	2	91	1	23	0	0	82	18
Kalmune	0	365	1	52	0	0	0	1	0	28	0	2	0	0	0	0	0	0	1	55	0	4	0	0	23	77
SRI LANKA	213	13423	43	1289	2	63	9	387	7	516	35	1365	13	827	14	582	0	13	82	1724	10	256	19	351	61	39

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 01st May, 2015. Total number of reporting units 337. Number of reporting units data provided for the current week: 209. C**=Completeness

Table 2: Vaccine-Preventable Diseases & AFP

25th - 01st May 2015 (18th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2015	Number of cases during same week in 2014	Total number of cases to date in 2015	Total number of cases to date in 2014	Difference between the number of cases to date in 2014 & 2015
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	01	00	00	00	00	00	00	00	01	02	23	31	-26.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	%
Mumps	04	00	00	01	02	02	00	00	01	10	08	138	270	-49.1%
Measles	18	03	05	01	01	04	03	00	01	36	46	794	1591	-50.1%
Rubella	00	00	00	00	00	00	00	00	00	00	00	05	08	-37.5%
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	03	%
Tetanus	00	00	00	00	00	00	00	00	01	01	01	05	08	-37.5
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	02	07	17	-59.1%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	02	30	23	+30.4%
Tuberculosis	18	17	11	03	04	01	00	05	01	60	234	3261	3556	-9.1%

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.
 RDHS 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.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS,

Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis

CRS** =Congenital Rubella Syndrome

AFP and all clinically confirmed Vaccine Preventable Diseases except Tuberculosis and Mumps should be investigated by the MOH

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to chepid@slt.net.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication

ON STATE SERVICE

Dr. P. PALIHAWADANA
 CHIEF EPIDEMIOLOGIST
 EPIDEMIOLOGY UNIT
 231, DE SARAM PLACE
 COLOMBO 10