WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
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WER SRI LANKA 2018

Vol. 45 No. 18 **28th– 04th May 2018**

Pertussis (Whooping Cough)

Pertussis (whooping cough) is an important cause of morbidity and mortality in infants worldwide, and continues to be a public health concern despite high vaccination coverage.

The disease, caused by the bacterium Bordetella pertussis, is endemic in all countries. Epidemic cycles have been occurring every 2 to 5 years (typically 3 to 4 years), even after the introduction of effective vaccination programmes and the achievement of high vaccination coverage.

Mode of transmission

Pertussis is transmitted from infected to susceptible individuals by droplets. In its early catarrhal stage, pertussis is highly contagious, with a secondary attack rate of up to 90% among non-immune household contacts. Untreated patients may transmit infection for 3 weeks or more following the onset of typical coughing attacks, although communicability diminishes rapidly after the catarrhal stage.

B. pertussis is a small, fastidious Gram-negative coccobacillus which infects the ciliated epithelial cells of the human respiratory tract. Pertussis-like symptoms may also be caused by Adenoviruses, Respiratory syncytial virus , Human parainfluenza viruses, influenza viruses, Mycoplasma pneumoniae and other agents, and thus laboratory confirmation is important.

Disease

Following an incubation period of 9–10 days (range 6–20 days), patients develop catarrhal symptoms, including cough. During the course of 1 –2 weeks, coughing paroxysms ending in the characteristic “whoop” may occur. In typical cases, cough is particularly severe at night and frequently followed by vomiting. In very young infants, pertussis may initially present with clinical manifestations such as apnoea and cyanosis, other than cough,

Diagnosis and treatment

Aetiological diagnosis is based on recovering B. pertussis from nasopharyngeal specimens obtained during the catarrhal and early paroxysmal stages. Traditionally, bacterial culture has been considered the gold standard for laboratory confirmation.

Polymerase Chain Reaction (PCR) is expensive but more sensitive and more rapid than culture . When specimens are collected for PCR testing , it is preferred to collect the specimens by using a dacron swab with polystyrene sticks.

The timing of PCR testing for pertussis can significantly affect its ability to accurately diagnose the disease. PCR has optimal sensitivity during the first 3 weeks of cough when bacterial DNA is still present in the nasopharynx. After the fourth week of cough, the amount of bacterial DNA rapidly diminishes, which increases the risk of obtaining falsely-negative results.

Macrolide antibiotics, such as erythromycin, may prevent or mitigate clinical pertussis when given during the incubation period or the early catarrhal stage. When given during the paroxysmal phase of the disease, antimicrobial drugs do not change the clinical course, but may eliminate the bacterium from the nasopharynx and thus reduce transmission.

Naturally-acquired immunity

Following natural pertussis infection, antibody to purtussis – the only B. pertussis-specific antigen –

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is found in 80%–85% of patients. Neither the type nor the concentration of antibodies is well correlated with clinical protection, and so far no protective role has been identified for cell-mediated immunity in humans. Natural infection does not confer long-lasting protection against pertussis. Although there is placental passage of pertussis antibodies, most infants do not seem to be protected against clinical disease during the first months of life unless the mother has been recently vaccinated, likely due to the low and inadequate levels of antibody transferred.

Pertussis vaccines

For several decades, programmes using pertussis vaccines of documented quality to immunize infants have been highly successful in preventing severe pertussis in infants worldwide.

Two types of pertussis vaccines are available: whole-cell (wP) vaccines based on killed B. pertussis organisms, and acellular (aP) vaccines based on one or more highly purified individual pertussis antigens. The wP vaccines were introduced widely in industrialized countries in mid-20th century, and included in the immunization programme since 1974.

Despite it being effective in preventing clinical disease, the vaccine has limited impact on the circulation of the B. pertussis even when vaccine coverage is high. Non immunized children and adults with waning immunity may serve as reservoirs of the infection and they occasionally transmit the infection to unimmunized children . This allows the occurrence of pertussis outbreaks , although high vaccination coverage may prolong the inter-epidemic intervals.

WHO position

The main aim of pertussis vaccination is to reduce the risk of severe pertussis in infants and young children, due to the high morbidity and mortality caused by the disease in this age group.

All children worldwide, including HIV-positive individuals, should be immunized against pertussis. Every country should seek to achieve early and timely vaccination initiated not later than 8 weeks of age, and maintain high coverage (≥90%) with at least 3 doses of assured quality pertussis vaccine at all levels (national and subnational). This will ensure high levels of protection in children in the < 5 year age group.

The duration of protection following primary immunization varies considerably depending upon factors such as local epidemiology, vaccination schedule and choice of vaccine. Therefore, a booster dose is recommended for children aged 1–6 years, preferably during the second year of life (≥6 months after last primary dose) . Only aP-containing vaccines should be used for vaccination of persons aged ≥7 years. Although a booster dose in adolescence has been shown to decrease disease in adolescents, this is not generally recommended as a means of controlling pertussis in infants.

Surveillance

Careful epidemiological surveillance of pertussis, particularly laboratory-confirmed disease, should be encouraged worldwide to monitor the disease burden and the impact of immunization. Investigation of outbreaks may also produce valuable information and should be encouraged.

Surveillance case definition

A person with a paroxysmal cough* with at least one of the following;

Inspiratory “whooping”

Post-tussive vomiting (i.e. vomitting immediately after coughing)

Subconjunctival haemorrhage

Without other apparent cause

*In older children if cough lasts more than two weeks and in neonates apnoeic attacks may be present.

Source:

World Health Organization. Weekly epidemiological record . Pertussis vaccines: WHO position paper , 28 AUGUST 2015, 90th YEAR .No. 35, 2015, 90, 433–460 http://www.who.int/wer

World Health Organization. Laboratory manual for the diagnosis of whooping cough caused by Bordetella pertussis/ Bordetella parapertussis . Update 2014. Immunization, Vaccines and Biologicals . www.who.int /vaccines-documents/

Surveillance case definition for notifiable diseases in Sri Lanka . 2nd Edition. 2011. Epidemiology Unit , Ministry of Health Sri lanka.

Immunization handbook. Third edition. 2012 . Epidemiology Unit , Ministry of Health Sri Lanka.

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 21st – 27th Apr 2018 (17th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmania-sis		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	135	2677	5	28	0	4	0	18	2	7	9	78	0	5	0	3	0	0	30	312	1	20	1	2	**64**	**100**
Gampaha	46	1529	0	17	0	4	0	11	0	10	2	92	0	2	0	4	0	0	15	314	5	18	3	9	**74**	**100**
Kalutara	52	1186	1	24	0	2	0	2	0	34	4	169	1	3	0	5	0	0	11	222	0	31	0	3	**54**	**100**
Kandy	36	1073	3	24	0	4	1	2	1	7	2	17	4	44	0	10	0	0	9	129	3	11	0	6	**62**	**100**
Matale	26	347	0	5	0	1	0	0	0	10	6	23	0	1	0	3	0	0	2	17	1	5	1	40	**62**	**100**
NuwaraEliya	1	64	2	13	1	3	0	7	0	2	0	9	2	64	0	12	0	0	4	108	0	16	0	0	**29**	**100**
Galle	12	422	1	15	0	5	0	0	0	2	17	182	1	13	0	1	0	1	8	108	3	18	0	4	**13**	**100**
Hambantota	18	432	0	6	0	0	0	2	0	4	0	17	0	21	0	1	0	0	1	104	0	2	8	229	**73**	**100**
Matara	12	401	2	15	1	5	0	3	0	21	12	82	1	18	0	2	0	0	2	121	0	3	18	150	**55**	**100**
Jaffna	16	1243	7	58	0	0	3	23	0	196	0	5	3	207	0	0	0	0	6	141	0	6	1	2	**34**	**93**
Kilinochchi	1	115	0	10	0	1	0	8	0	1	0	2	0	7	0	0	0	1	1	23	0	0	0	0	**51**	**100**
Mannar	0	25	0	10	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	16	0	1	0	0	**36**	**100**
Vavuniya	7	191	0	5	0	3	1	24	0	7	0	17	0	7	0	0	0	1	1	20	0	1	0	3	**56**	**100**
Mullaitivu	0	29	0	2	0	0	0	6	0	9	0	6	0	2	0	0	0	0	0	6	0	0	0	1	**14**	**100**
Batticaloa	162	2219	2	68	0	5	0	2	0	14	0	15	0	1	0	2	0	1	4	51	0	9	0	0	**62**	**100**
Ampara	3	60	1	15	0	0	0	1	0	2	1	20	0	0	0	3	0	0	1	80	0	4	0	1	**70**	**100**
Trincomalee	23	319	0	22	0	0	0	4	0	8	4	22	0	13	0	1	0	0	5	96	1	2	0	10	**31**	**100**
Kurunegala	31	1091	6	58	0	5	1	8	0	2	2	39	0	6	1	8	0	1	11	207	4	38	2	78	**69**	**100**
Puttalam	20	992	0	16	0	4	0	3	0	4	1	13	0	6	0	1	0	0	4	60	1	32	0	1	**74**	**100**
Anuradhapura	20	336	0	18	0	2	0	2	0	6	4	53	0	12	0	4	0	0	10	154	3	13	10	129	**44**	**100**
Polonnaruwa	11	111	0	10	0	1	0	0	4	10	1	51	0	0	1	3	0	0	11	87	1	7	5	69	**64**	**100**
Badulla	7	176	1	39	0	4	0	5	0	7	2	52	3	26	0	10	0	0	5	224	2	35	1	3	**49**	**100**
Monaragala	13	433	3	39	0	2	0	1	0	2	11	129	1	57	1	6	0	0	4	64	0	16	0	16	**60**	**100**
Ratnapura	52	700	4	64	1	23	0	8	0	2	14	148	0	17	0	6	0	1	8	132	2	43	3	108	**42**	**100**
Kegalle	50	502	1	22	0	5	1	3	2	62	11	50	4	37	0	7	0	0	14	150	1	17	0	3	**65**	**100**
Kalmune	44	1091	2	20	0	0	0	1	4	19	0	2	0	0	0	1	0	0	11	78	1	6	0	1	**47**	**100**
SRILANKA	**798**	**17764**	**41**	**623**	**3**	**83**	**7**	**146**	**13**	**450**	**10**	**1294**	**20**	**569**	**3**	**93**	**0**	**6**	**178**	**3024**	**29**	**354**	**53**	**868**	**54**	**99**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 27th April , 2018 Total number of reporting units 351 Number of reporting units data provided for the current week: 351 C**-Completeness

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

Table 2: Vaccine-Preventable Diseases & AFP

21st - 27th Apr 2018 (17th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2018	Number of cases during same week in 2017	Total number of cases to date in 2018	Total number of cases to date in 2017	Difference between the number of cases to date in 2018 & 2017
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	01	00	00	00	00	00	00	01	00	02	02	20	29	- 31 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	02	01	00	01	02	01	01	00	00	08	02	131	106	23.5 %
Measles	06	00	00	00	00	00	02	00	00	08	02	47	105	- 55.2%
Rubella	00	00	00	00	00	00	00	00	00	00	01	04	06	- 33.3 %
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Tetanus	00	00	00	01	00	00	00	00	00	01	01	09	08	12.5 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	13	21	- 38.0%
Whooping Cough	01	00	00	00	00	00	00	00	00	01	00	15	05	200%
Tuberculosis	67	19	35	05	07	11	12	10	25	258	137	2521	2615	- 3.5 %

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

NA = Not Available

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them free of water collection.

PRINTING OF THIS PUBLICATION IS FUNDED BY THE WORLD HEALTH ORGANIZATION (WHO).

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@sltnet.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

ON STATE SERVICE

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