WEEKLY EPIDEMIOLOGICAL REPORT

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WER SRI LANKA - 2011

Vol. 38 No.27 **02nd – 08th July 2011**

Soil Transmitted Helminthiasis (STH)

There are parasitic worms of various types which live in a person's intestines and cause ill health. Some of the parasitic worms are transmitted through soil (e.g. Roundworm), some are transmitted trough faeco-oral route (e.g. Pinworm) and some are transmitted through consumption of under cooked or raw meat (e.g. Tape worm). Parasites transmitted through soil are collectively called as soil transmitted Helminthiasis (STH). This article aims to discuss some important species of STH.

Examples of common STH are given below

- **Ascaris lumbricoides (Roundworm)**
- **Strongyloides stercoralis**
- **Trichuris trichura (Whipworm)**
- **Ankylostoma duodenale (Hookworm)**
- **Necator americanus (Hookworm)**

Disease burden

Recent estimates suggest that round worm infects over 1 billion people, whipworm 795 million and hookworms (Ancylostoma duodenale and Necator americanus) 740 million. The greatest numbers of soil transmitted helminth infections occur in sub-Saharan Africa, the Americas, China and East Asia.

Who is most at risk?

From the time children stop breastfeeding and start crawling around the ground (frequently putting their hands in their mouths), they are at risk of STH infections. Without treatment, they become repeatedly reinfected and the number of worms living in them steadily increases. By the time they reach school, they can be harbouring hundreds of worms.

Mode of spread

A person infected with STH has eggs/larvae of parasites in their faeces. Soil and water around the neighbourhood becomes contaminated with faeces containing worm eggs/larvae in areas where there are no latrines. In the soil, the eggs and larvae mature. It is a process that takes between 2 to 4 weeks, depending on the type of worm.

The soil transmitted helminthes (STHs) can then infect humans in following ways

Ingestion of eggs:

- The eggs stick to vegetables grown in the area. If the vegetables are not carefully cooked, washed or peeled, the eggs are ingested along with food.
- The eggs are ingested from water sources which have become contaminated.
- Young children who play on the ground and often put their hands in their mouths without washing them ingest the eggs and become infected.

Penetration of the skin:

- Hookworm eggs hatch in the soil and resulting larvae rest in the soil. If a person walks on the contaminated soil, the larvae can penetrate the skin, usually between toes.
- Larvae of Strongiloides develop into infective larvae and enter the body, after penetrating the skin.

There is no direct person to person transmission or infection from fresh faeces because eggs/larvae passed in faeces need about 3 weeks in the soil before they become infective. Because STHs do not multiply in the human host (as with viruses, bacteria, fungi and protozoa), reinfection is always the result of new contact with an infected environment.

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Symptoms of infection

The symptoms of STH infections are nonspecific and only become evident when the infection is particularly severe. The nonspecific symptoms include nausea, tiredness, abdominal pain and loss of appetite.

Other more pronounced symptoms are

- Anaemia.-Hookworms live in the intestine. They attach and re-attach themselves to the wall of the intestine every few hours as they feed on blood from the cut vessels and mucosal tissues. This blood loss contributes to anaemia, especially in countries where the dietary intake of iron is already marginal.

- Vitamin A deficiency- STHs need vitamin A to live. In many countries, a person's vitamin A intake is already marginal. In these situations, STH infections can compete for the limited amount of vitamin A which is absorbed.

- Loss of appetite

- Wandering of the worms- Wandering ascaris may reach abnormal foci and cause acute symptoms including vomiting. Vomiting of the worm may cause swelling of the glottis and larynx. This results in difficulty in breathing. Blockage of the bile ducts may cause obstructive jaundice and migration into the liver may result in liver abscess.

- Temporary cough and wheezing

Impact on health

The impact of STH infections on an infected person's life can be significant.

- Restricted growth- Loss of appetite, increased levels of vitamin A deficiency and higher anaemia levels all interfere with a child's ability to grow healthily and to his or her full potential. Moreover, there is evidence to suggest that a child with heavy worm infections is less resistant to other infections. Hence, a child infected with STHs will be more likely to have more health problems when they are young and this tendency might persist when they grow up also.

- Need for surgery-When the number of worms in the body becomes extremely high, they build up in the child's intestines, stopping the normal flow of blood and eventually blocking the intestine entirely. The only solution in this situation is surgical intervention and in many cases this is not possible in remote areas and the child can die.

- Reduced ability to learn- Worm infested children are less able to concentrate or memorize information. They score less in school tests and this hinders their education.

Treatment

There are four drugs to treat STH infections: Albendazole, Mebendazole, pyrantel and levamisole. These drugs are generally effective against the common STHs.

For whipworms, these drugs are less effective. Albendazole and mebendazole have a 50–80% egg reduction rate and levamisole between 10% and 50%. Pyrantel has very little effect on whipworms.

Iron deficiency anaemia should also be treated at the same time; Iron can be given orally.

- From age 1 to 5 years: Ferrous Sulphate Tablets 100 mg (1/2 tablet) every 12 hours for 2 months.
- For children older than 5 years of age: Ferrous Sulphate Tablets 200 mg every 12 hours for 2 months.

Importance of treating school age children

They typically have the highest worm loads.

- They are at a particularly important time of their lives for growing.
- High levels of worm infestation make them less able to resist other infections.
- It may be the only time in their lives they have a chance to go to school and learn.
- If the infection rates are reduced in this group, the environment becomes less contaminated, benefiting the whole community.

Summery

Soil transmitted Helminthisis is a wide spread global problem. Person infected with STH has parasite's eggs/larvae in their faeces. In areas where there is no latrine system, the soil and water around the neighbourhood becomes contaminated with faeces containing worm eggs/larvae. In the soil, the eggs and larvae mature and are ingested or the larvae penetrate the skin and enter the body. It affects children from the time they stop breastfeeding and start crawling around the ground and they become repeatedly reinfected and grow into sickly adults. The spread of STH can be prevented by sanitary disposal of excreta. STH can be treated successfully with Albendazole, Mebendazole, Levimazole and Pyrantel pamoate. In addition, amnaemia can be corrected through Iron supplementation.

Sources

Soil-transmitted Helminthiasis-Magnitude of STH in the South-East Asia Region (WHO), available from

http://www.searo.who.int/en/Section10/Section2289_12107.htm

Partners for Parasite Control (WHO), available from

http://www.who.int/wormcontrol/statistics/useful_info/en/index2.html

http://www.who.int/wormcontrol/statistics/useful_info/en/index3.html

Helminthiasis, available from

http://wikieducator.org/ lesson_15:_Intesti nal_ Helminths

Compiled by Dr. Madhava Gunasekera of the Epidemiology unit

Table 1: Vaccine-preventable Diseases & AFP

25th June – 01st July 2011 (26th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01	00	00	00	00	00	00	01	02	01	48	45	+ 06.7 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Measles	01	00	00	00	00	01	01	02	00	03	04	77	54	+ 44.4 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	12	13	- 07.6 %
Whooping Cough	01	00	00	00	00	01	00	00	00	02	00	19	14	+ 26.3 %
Tuberculosis	77	10	20	03	89	06	20	32	36	293	305	4453	4719	- 05.6 %

Table 2: Newly Introduced Notifiable Disease

25th June – 01st July 2011 (26th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	12	06	07	00	01	08	02	05	04	45	61	2483	1910	+ 30.0 %
Meningitis	01 KL=1	01 KD=1	02 GL=1 HB=1	01 MN=1	00	06 KN=2 PU=4	00	00	03 KG=2 RP=1	14	39	463	967	- 52.1 %
Mumps	07	07	11	02	05	08	02	04	08	54	38	1361	525	+ 159.2 %
Leishmaniasis	00	00	12 HB=11 MT=1	00	00	00	07 AP=5 PO=2	00	00	19	04	367	160	+ 129.3 %

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.

Data Sources:

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

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008. .

Dengue Prevention and Control Health Messages

Reduce, Reuse or Recycle the plastic and polythene collected in your home and help to minimize dengue mosquito breeding.

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

25th June – 01st July 2011 (26th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	475	4331	4	115	0	5	1	71	3	12	8	238	0	6	2	30	0	2	**92**
Gampaha	100	1402	2	79	0	11	0	28	0	17	8	339	1	17	11	71	0	4	**73**
Kalutara	30	653	1	90	0	4	0	28	1	19	7	168	0	0	0	4	0	0	**83**
Kandy	38	317	12	243	0	4	4	21	1	31	4	100	2	69	1	33	0	0	**100**
Matale	19	170	6	77	0	3	1	18	0	8	2	133	0	12	1	5	0	0	**92**
Nuwara	3	78	15	234	0	3	0	31	0	89	0	28	0	47	0	12	0	1	**85**
Galle	51	372	2	48	0	5	0	6	0	5	5	100	1	18	0	7	0	2	**84**
Hambantota	14	268	1	23	0	4	0	2	4	18	3	396	2	35	0	5	0	0	**100**
Matara	16	245	1	45	0	2	0	8	0	10	4	195	1	45	0	12	0	1	**100**
Jaffna	9	169	6	113	0	3	3	154	60	53	0	2	0	180	0	16	0	1	**91**
Kilinochchi	0	36	0	12	0	3	0	7	0	10	0	2	0	8	0	3	0	0	**50**
Mannar	0	22	0	10	0	0	2	18	0	78	0	11	1	30	0	2	0	0	**100**
Vavuniya	0	54	0	22	0	10	0	8	0	39	0	35	0	2	0	1	0	0	**75**
Mullaitivu	0	14	0	29	0	1	0	2	0	4	0	5	0	1	0	2	0	0	**75**
Batticaloa	10	618	8	466	0	4	0	5	1	11	0	20	0	1	0	2	0	4	**71**
Ampara	4	80	2	67	1	1	0	7	0	24	0	54	0	1	0	7	0	0	**71**
Trincomalee	0	104	6	492	1	2	0	2	0	8	0	80	0	4	0	6	0	0	**92**
Kurunegala	32	429	9	192	0	6	4	58	4	46	5	1342	0	47	0	19	0	3	**87**
Puttalam	10	293	5	110	0	0	0	17	0	9	1	88	0	15	0	6	0	1	**67**
Anuradhapu	10	154	2	78	0	1	0	2	0	24	0	229	0	16	0	8	0	1	**89**
Polonnaruw	9	179	2	76	0	1	0	9	0	12	1	72	0	1	1	10	0	0	**86**
Badulla	41	231	7	149	0	5	1	41	0	7	0	36	1	40	3	29	0	0	**76**
Monaragala	9	131	5	52	0	4	0	21	0	10	3	163	1	47	1	40	0	0	**91**
Ratnapura	15	441	6	299	1	5	1	30	0	16	3	307	0	22	1	25	0	2	**72**
Kegalle	13	299	1	67	0	12	0	49	0	22	5	236	0	18	6	74	0	0	**91**
Kalmune	1	20	2	414	0	0	0	0	0	15	0	4	0	2	0	2	0	1	**100**
SRI LANKA	**909**	**11110**	**105**	**3602**	**03**	**99**	**17**	**643**	**20**	**597**	**59**	**4383**	**12**	**684**	**27**	**431**	**00**	**23**	**86**

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 01st July , 2011 Total number of reporting units =320. Number of reporting units data provided for the current week: 282
A = Cases reported during the current week. **B** = Cumulative cases for the year.

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.**

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