WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health

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Scrub Typhus (Part II)

This is the second in a series of two articles on Scrub typhus

Complications

Complications may include atypical pneumonia, overwhelming pneumonia with adult respiratory distress syndrome (ARDS) like presentation, myocarditis and disseminated intravascular coagulation (DIC). Patients with scrub typhus often exhibit leucopenia.

Diagnosis

Differentiating scrub typhus from other forms of typhus as well as from fever, typhoid and meningococcal infections is often difficult during the first several days before the initial rash appears. The most common signs are similar to a variety of other infectious diseases (typhoid fever, murine typhus, leptospirosis and dengue fever, etc.) which should be taken into consideration. The geographical location of scrub typhus, the initial sore caused by the chigger bite, and the occurrence of specific proteins capable of destroying the organism (antibodies) in the blood, provide helpful clues and are useful in establishing the diagnosis.

The diagnosis may be confirmed by a laboratory test such as serology. The cheapest and most easily available serological test is the Weil-Felix test, but this is notoriously unreliable. Fifty per cent of patients have a positive test result during the second week. This test is now being replaced by a complement-fixation test. It is a serological test to detect specific antibody or specific antigen in a patient's serum. Each patient's serum is systematically tested against five O. tsutsugamushi serotypes.

An IgM titer >1:32 and/or a four-fold increase of titers between two sera confirm a recent infection. However, due to cross-reactions among serotypes, it is difficult to identify accurately a specific serotype.

The gold standard is indirect immunofluorescence antibody (IFA). Indirect immunoperoxidase (IIP) is a modification of the standard IFA method that can be used with a light microscope, and the results of these tests are comparable to those from IFA. Serological methods are most reliable when a four-fold rise in antibody titre is looked for. Although many techniques have been used successfully for serodiagnosis, relatively few are used regularly by most laboratories.

Commercial rapid diagnostic kits provide reliable and well-accepted preliminary results within one hour, but the availability of these tests is severely limited by their cost. However, other serological tests must be used in order to obtain confirmation of O. tsutsugamushi infection. ELISA provides more sensitivity and equal specificity when compared to commercial test kits.

The organism can be grown in tissue culture or mice from the blood of patients with scrub typhus but results are not available in time to guide clinical management.

Molecular detection using polymerase chain reaction (PCR) is possible from skin rash biopsies, lymph node biopsies or ethylenediaminetetraacetic acid (EDTA) blood. O. tsutsugamushi can be demonstrated by standard and by nested PCR. Real-time PCR assays are as sensitive as standard PCR but are more rapid and can give quantitative results.

Specimens

Different types of Specimens can be collected for laboratory investigation but it depends on the diagnostic method to be used. The laboratory should be

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contacted in advance to decide on the types of specimen to be collected. The following specimens can be collected for laboratory investigation provided they are preserved and shipped as follows

Skin or lymph node biopsy
If frozen at -80°C after sampling, ship in dry ice for culture.

- If not frozen at -80°C after sampling, ship at room temperature for PCR.
- If formalin-treated or paraffin-embedded, ship at room temperature for immunohistochemistry.

Heparinized blood

- Conserve at -80°C and then ship in dry ice for culture.

EDTA blood

- Conserve at +4°C and then ship at room temperature for PCR

Serum

- Conserve at +4°C, then ship at room temperature. Collect two serum specimens 10 days apart.

Treatment

Scrub typhus is treated with antibiotics. The drug most commonly used is doxycycline; but chloramphenicol is an alternative. A combination therapy with doxycycline and rifampicin should be used in areas where there is poor response to doxycycline alone. Azithromycin or chloramphenicol is useful for treating infection in children or pregnant women (doxycycline is relatively contraindicated in children). Antibiotic therapy brings about prompt disappearance of the fever and dramatic clinical improvement. Rapid defervescence after antibiotic treatment is so characteristic that it is used as a diagnostic test for O. tsutsugamushi infection.

These antibiotics are bacteriostatic and merely slow the multiplication of the organism while the patient develops a protective immune response. Both animals and humans develop non-
sterile immunity and viable rickettsiae have been recovered from lymph tissue long after infection.

If the antibiotic treatment is discontinued too quickly, especially in patients treated within the first few days of the fever, relapses may occur. Secondary infections, such as bacterial pneumonia, should be treated appropriately. No significant morbidity or mortality occurs in patients who receive appropriate treatment.

Prophylaxis

It has been shown that a single oral dose of chloramphenicol or tetracycline given every five days for a total of 35 days, with 5-day non-treatment intervals, actually produces active immunity to scrub typhus. This procedure is recommended under special circumstances in certain areas where the disease is endemic.

There are no effective vaccines for scrub typhus. It is now known that there is enormous antigenic variation in Orientia tsutsugamushi strains, and immunity to one strain does not confer immunity to another. Any scrub typhus vaccine should give protection to all the strains present locally, in order to give an acceptable level of protection. A vaccine developed for one locality may not be protective in another locality, because of antigenic variation. This complexity continues to hamper efforts to produce a viable vaccine.

Prevention

In endemic areas, precautions include wearing protective clothing. Insect repellents containing dibutyl phthalate, benzyl benzoate, diethyl toluamide and other substances can be applied to the skin and clothing to prevent chigger bites. Do not sit or lie on bare ground or grass; use a suitable ground sheet or other ground cover.
Clearing of vegetation and chemical treatment of the soil may help to break up the cycle of transmission from chiggers to humans to other chiggers.

Case identification, public education and rodent control and habitat modification are the three pillars of programme aimed at controlling the impact of scrub typhus on the human population.

Rapid case identification by health-care workers -The early diagnosis of acute scrub typhus can greatly reduce the chance of life-threatening complications and guide optimal therapy. It will be necessary to increase awareness of empirical therapy options for scrub typhus and to develop diagnostic assays that are affordable, require limited expertise and equipment and are sensitive and specific so they can be used in endemic, resource poor countries.

Public education on case recognition and personal Protection-Advocacy, awareness and education activities should be targeted at schoolchildren, teachers and women groups in endemic areas. Involvement of community-based organizations in prevention and control of scrub typhus is important.

Rodent control and habitat modification-Rodent control is a multidimensional activity that requires multisectoral cooperation.

Different control strategies such as trapping, poisoning and use of natural predators are in practice.

Several wildlife rehabilitation organizations encourage the natural form of rodent control through exclusion and predator support and preventing secondary poisoning altogether.

Habitat modification will make areas less attractive to commensal rodents and thereby prevent new populations from recolonizing the habitat. Allowing weeds to grow around buildings also encourages rats and mice. Good sanitation in and around buildings creates an environment that is less suited for rodent populations. Proper sanitation may not eliminate rat populations but often can prevent them from flourishing in high numbers. Repeated increase in rodent population even after the use of poisons is a good indication that habitat modification is needed.

Source-Frequently Asked Questions-ScrubTyphus, av ailble from *http://www.searo.who.int/entity/emerging_diseases/CDS_faq_Scrub_Typhus.pdf*

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Table 4: Selected notifiable diseases reported by Medical Officers of Health 16th Nove- 22th Nove(47th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		E Fever		F Poisoning		Leptospirosis		T Fever		V Hepatitis		H 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	123	9043	3	209	0	17	2	155	0	59	8	203	0	9	0	81	0	1	2	424	2	68	0	0	**69**	**31**
Gampaha	36	3372	1	201	1	23	0	51	0	40	8	431	0	21	1	186	0	0	1	169	1	93	0	5	**53**	**47**
Kalutara	34	1651	3	179	0	20	0	83	0	27	7	387	0	7	0	25	0	0	3	260	3	73	0	0	**69**	**31**
Kandy	17	1641	4	160	1	12	1	28	2	14	1	74	0	99	2	119	0	0	0	139	0	16	0	5	**74**	**26**
Matale	2	437	1	105	0	4	0	25	0	10	0	65	0	4	1	53	0	0	0	45	0	35	0	13	**46**	**54**
NuwaraEliya	5	241	2	159	0	2	0	17	0	217	1	31	0	62	1	25	0	0	9	142	1	13	0	0	**77**	**23**
Galle	16	809	2	122	0	19	0	7	0	89	6	215	2	66	0	16	0	2	5	311	0	47	0	2	**89**	**11**
Hambantota	5	312	0	62	0	3	1	16	0	38	5	169	0	64	1	91	0	0	1	99	0	53	7	325	**67**	**33**
Matara	10	445	4	89	2	15	0	29	0	29	4	153	2	90	4	147	0	2	7	254	3	84	5	98	**94**	**6**
Jaffna	10	667	16	420	0	10	4	319	0	114	0	9	4	350	0	17	0	1	3	147	0	57	0	0	**92**	**8**
Kilinochchi	0	61	0	43	0	0	0	15	0	5	0	9	0	16	0	0	0	2	0	2	0	7	0	12	**0**	**100**
Mannar	0	68	1	75	0	3	0	68	0	36	0	15	0	20	0	2	0	0	0	12	0	7	0	4	**100**	**0**
Vavuniya	1	73	2	68	0	13	0	14	0	20	0	51	0	3	0	4	0	2	0	22	1	6	1	14	**50**	**50**
Mullaitivu	2	120	1	25	0	2	0	10	0	43	0	38	0	7	0	2	0	2	0	8	0	34	0	15	**80**	**20**
Batticaloa	4	523	10	355	0	5	0	10	0	73	0	33	0	2	1	15	0	3	0	45	0	6	0	0	**64**	**36**
Ampara	1	196	5	187	0	1	0	5	0	12	0	38	0	1	0	10	0	0	1	90	0	8	0	3	**86**	**14**
Trincomalee	4	191	2	71	0	3	0	6	0	3	0	60	0	15	0	4	0	1	0	41	0	18	1	30	**67**	**33**
Kurunegala	17	2615	8	206	0	42	1	41	0	26	15	355	1	47	3	62	0	1	9	354	0	4	0	57	**78**	**22**
Puttalam	7	858	0	76	0	7	0	17	0	36	0	43	0	14	0	7	0	1	2	86	1	101	0	11	**62**	**38**
Anuradhapur	1	495	0	103	0	17	0	3	0	70	0	310	0	25	0	27	0	2	0	167	0	35	5	402	**16**	**84**
Polonnaruwa	8	450	5	89	1	3	0	14	2	70	1	168	0	3	1	35	0	2	2	136	0	95	4	164	**71**	**29**
Badulla	10	493	1	205	0	5	1	22	0	12	1	60	0	88	0	46	0	0	3	131	2	22	0	7	**76**	**24**
Monaragala	4	251	2	121	0	6	0	25	0	37	2	201	0	62	0	185	0	1	1	56	2	72	0	10	**82**	**18**
Ratnapura	18	1652	11	384	0	84	1	41	0	20	11	377	0	73	10	551	0	1	6	192	0	26	0	13	**72**	**28**
Kegalle	27	1122	1	129	0	17	2	32	0	11	19	281	0	74	8	239	0	0	4	327	3	82	0	2	**91**	**9**
Kalmune	4	499	11	166	0	2	2	6	0	122	0	11	0	3	0	5	0	0	1	96	2	110	0	1	**69**	**31**
SRI LANKA	**366**	**28285**	**96**	**4009**	**5**	**335**	**15**	**1059**	**4**	**1233**	**89**	**3787**	**9**	**1225**	**33**	**1954**	**0**	**24**	**60**	**3755**	**21**	**1177**	**23**	**1193**	**70**	**30**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 22nd November , 2013 Total number of reporting units 337. Number of reporting units data provided for the current week:236C** Completeness

A = Cases reported during the current week. B = Cumulative cases for the year.H Rabies*= Human Rabies, E Fever*=Enteric Fever, F Poison* =Food Poisoning, T Fever*=Typhus Fever, V Hepatitis*=Viral Hepatitis

Table 1: Vaccine-Preventable Diseases & AFP 16th Nove – 22th Nove2013 (47th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2013	Number of cases during same week in 2012	Total number of cases to date in 2013	Total number of cases to date in 2012	Difference between the number of cases to date in 2013 & 2012
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	02	00	00	00	01	00	00	00	00	03	01	94	71	+32.4%
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Mumps	03	01	05	01	05	04	00	00	00	19	33	1399	4114	-66.0%
Measles	15	01	08	01	00	01	01	00	18	45	01	3692	61	+5952.5%
Rubella	00	00	00	00	00	00	00	00	00	00	-	27	-	-
CRS**	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Tetanus	00	00	01	00	00	00	00	00	00	01	00	23	12	+91.7%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	-	68	-	-
Whooping Cough	00	00	00	00	00	00	00	00	00	00	01	82	95	-13.7%
Tuberculosis	58	11	10	04	10	00	00	06	63	164	94	7516	7912	-5.0%

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

Thoroughly clean the water collecting tanks bird baths, vases and other utensils once a week to prevent dengue mosquito breeding.

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

ON STATE SERVICE

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