WEEKLY EPIDEMIOLOGICAL REPORT

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Yellow Fever Vaccine–New Developments

Background

Yellow fever is an acute viral disease, belonging to the group of hemorrhagic fevers.

Agent

The disease is caused by the yellow fever virus which is an arbovirus. It is an RNA virus of the genus Flavivirus belonging to Flaviviridae family. The virus only infects humans, other primates and several species of mosquitoes.

Transmission

The mosquito is the primary vector that carries the virus from one host to another. It is primarily spread by female mosquitoes of the Aedes aegypti species, but other mosquitoes such as the tiger mosquito (Aedes albopictus) can also transmit the virus.

There are three types of transmission cycles. However, urban yellow fever occurs periodically in Africa and sporadically in the Americas.

Sylvatic (or jungle) yellow fever: This involves transmission of the virus between nonhuman primates and mosquito species found in tropical rainforests. The virus is transmitted to humans via mosquitoes when the humans encroach into the jungle during occupational or recreational activities.

Intermediate yellow fever (savannah): In humid or semi-humid parts of Africa, small-scale epidemics occur. Semi-domestic mosquitoes (that breed in the wild and around households) infect humans living or working in jungle border areas. This is the most common type of outbreak in Africa.

Urban yellow fever: Large epidemics occur when infected people introduce the virus into densely populated areas with a high number of non-immune people. Infected mosquitoes transmit the virus from person to person.

Epidemiology

Yellow fever occurs in sub-Saharan Africa and tropical South America, where it is endemic and intermittently epidemic. In Africa, natural immunity accumulates with age. Therefore, infants and children are at highest risk for disease. In South America, yellow fever occurs most frequently in unimmunized young men who are exposed to mosquito vectors through their work in forested areas.

Disease transmission in rural West Africa is seasonal, with an elevated risk during the end of the rainy season and the beginning of the dry season (usually July–October). The risk for infection in South America is highest during the rainy season (January–May, with a peak incidence in February and March).

Disease Burden

The World Health Organization (WHO) estimates that Yellow Fever Virus causes 200,000 cases of clinical disease and 30,000 deaths each year, with 90% occurring in Africa.

A recent analysis of African data sources estimates similar figures, but a slightly lower burden of 84 000–170 000 severe cases and 29,000–60,000 deaths due to yellow fever in Africa for the year 2013. Without vaccination, the burden figures would be much higher.

Small numbers of imported cases occur in countries free of yellow fever. Although the disease has never been reported in Asia, the region is at risk because of the presence of conditions required for transmission.

Situation in Sri Lanka

Yellow fever is a notifiable disease in Sri Lanka and all cases of yellow fever should be notified immediately to the local Medical Officer of Health and WHO. Although the vector mosquito

Contents

	Page
1. *Leading Article –Yellow Fever Vaccine-New Developments*	1
2. *Summary of selected notifiable diseases reported (22nd – 28th February 2014)*	3
3. *Surveillance of vaccine preventable diseases & AFP (22nd – 28th February 2014)*	4

(Aedes aegypti) is found in Sri Lanka, yellow fever cases have not been reported

Signs and symptoms

Yellow fever begins after an incubation period of three to six days. The disease can occur in one or two phases. The first, "acute", phase usually causes fever, muscle pain with prominent backache, headache, loss of appetite, nausea and vomiting. Most patients improve and their symptoms disappear after 3 to 4 days.

In about 15% of cases, a second toxic phase of the disease occurs with recurring high fever, abdominal pain with vomiting which is accompanied by jaundice due to liver damage. Bleeding from the mucosa can occur and deterioration of renal functions can be seen in most of the patients. Half of the patients who enter the toxic phase die within 10 to 14 days, the rest recover without significant organ damage.

Yellow fever is difficult to diagnose, especially during the early stages. It can be confused with severe malaria, dengue hemorrhagic fever, leptospirosis, viral hepatitis (especially the fulminating forms of hepatitis B and D) and other hemorrhagic fevers, as well as poisoning.

Diagnosis

In a patient with a possible history and suggestive clinical features, laboratory diagnosis is best performed by serologic assays to detect virus-specific IgM and IgG antibodies. Because of cross-reactivity between antibodies raised against other flaviviruses, more specific antibody testing is needed to confirm the infection.

Virus isolation or nucleic acid amplification tests performed early in the illness for yellow fever viral RNA. However, the virus or viral RNA is usually undetectable in latter part of the illness.

Risk for Travellers

The risk of acquiring yellow fever is difficult to predict because of variations in determinants of virus transmission. For example, a traveler's risk for acquiring yellow fever is determined by various factors, including immunization status, location of travel, season, duration of exposure, occupational and recreational activities while traveling and local rate of virus transmission at the time of travel. For a 2-week stay, the risks for illness and death due to yellow fever for an unvaccinated traveller visiting an endemic area in:

- West Africa are 50 per 100,000 and 10 per 100,000, respectively
- South America are 5 per 100,000 and 1 per 100,000, respectively

These risk estimates may not accurately reflect the true risk to travellers, who may have a different immunity profile, take precautions against getting bitten by mosquitoes and have less outdoor exposure.

The Yellow Fever Vaccine

The yellow fever vaccine is safe and affordable, providing effective immunity against yellow fever within 10 days for 80–100% of people and 99% immunity within 30 days. Serious side effects are extremely rare and the risk of death from yellow fever disease is far greater than the risks related to the vaccine.

The risk of "yellow fever vaccine-associated viscerotropic disease" in elderly (people over 60 years of age) is higher than in younger ages. Therefore, the vaccine should be administrated after careful risk-benefit assessment, comparing the risk of acquiring yellow fever disease versus the risk of a potential serious adverse event following immunization for people over 60 years of age.

People who should not receive the vaccine include:

- Children aged less than 9 months of age
- Pregnant women (except during a yellow fever outbreak when the risk of infection is high)
- People with severe allergies to egg protein
- People with severe immunodeficiency (due to symptomatic HIV/AIDS or other causes) or in the presence of a thymus disorder.

The Strategic Advisory Group of Experts on immunization (SAGE) has reviewed the latest evidence and concluded that a single dose of vaccination is sufficient to confer sustained immunity and life-long protection against yellow fever. In May 2013, the WHO announced that a Yellow Fever booster dose is no longer needed and the WHO invited its member states in December 2013 to consider accepting certificates of vaccination against yellow fever vaccination with approved vaccine at any time (provided it is at least ten days since administration of the vaccine prior to arrival).

Vaccination for Travellers

Some countries including Sri Lanka require vaccination for travellers. This is mainly to protect the country against Yellow Fever since the principal mosquito vectors are present in the country.

Yellow Fever is the only mandatory vaccine currently required under International Health Regulation (IHR). Travellers who are 09 months of age or above, particularly those who are visiting to countries falling within the Yellow Fever endemic areas (some countries in Africa and America) or arriving from such countries to Asia, must have a certificate of yellow fever vaccination. If there are medical grounds for not getting vaccinated, IHR state that this must be certified by the appropriate authorities.

Sources

Yellow fever (CDC), available from http://wwwnc.cdc.gov/travel/yellowbook/2014/chapter-3-infectious-diseases-related-to-travel/yellow-fever

"Yellow fever vaccination booster not needed " News release, Geneva, (2013) available from http://www.who.int/mediacentre/news/releases/2013/yellow_fever_20130517/en/

Compiled by Dr. H. A. Shanika Rasanjalee of the Epidemiology Unit

Table 1: Selected notifiable diseases reported by Medical Officers of Health 22nd – 28th feb 2014 (09th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishman-iasis		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	136	1965	2	28	0	2	1	17	1	135	1	22	0	0	0	6	0	0	18	78	0	9	0	3	**75**	**25**
Gampaha	34	875	3	31	0	1	0	10	0	7	5	45	0	3	0	18	0	2	15	104	0	17	0	1	**87**	**13**
Kalutara	19	413	0	27	0	2	1	11	0	41	4	60	0	0	1	4	0	0	8	57	2	16	0	0	**85**	**15**
Kandy	8	133	3	24	0	1	0	4	0	0	1	8	0	16	4	20	0	0	4	41	1	7	0	1	**87**	**13**
Matale	8	66	2	19	0	1	0	3	0	0	0	11	0	2	1	21	0	0	0	6	0	3	1	2	**69**	**31**
NuwaraEliya	4	39	3	41	0	1	1	8	0	6	0	0	0	16	1	7	0	0	2	19	0	4	0	0	**85**	**15**
Galle	8	152	0	19	1	3	0	0	0	3	0	31	0	12	0	0	0	0	3	50	2	10	0	1	**25**	**75**
Hambantota	4	72	0	11	0	3	0	6	0	0	1	26	4	25	1	4	0	0	6	45	1	12	8	53	**75**	**25**
0Matara	3	81	0	16	0	1	0	16	0	5	0	11	1	16	0	6	0	0	5	45	0	17	1	16	**100**	**0**
Jaffna	23	240	7	96	0	1	7	60	4	25	0	4	12	191	0	5	0	0	5	34	0	9	0	0	**100**	**0**
Kilinochchi	1	18	0	46	0	0	1	8	0	0	0	0	1	11	0	0	0	0	1	2	0	3	0	4	**100**	**0**
Mannar	0	3	2	10	0	7	2	18	0	0	0	3	0	13	0	1	0	0	0	1	0	1	0	1	**100**	**0**
Vavuniya	1	18	0	12	0	0	0	2	0	2	0	3	1	3	0	0	0	0	0	4	0	2	0	0	**25**	**75**
Mullaitivu	0	31	1	10	0	0	0	5	0	5	0	5	0	3	0	0	0	0	0	2	0	2	0	4	**40**	**60**
Batticaloa	13	102	2	66	1	1	4	13	0	11	0	3	0	1	1	3	0	0	3	9	0	1	0	0	**79**	**21**
Ampara	5	37	2	14	0	0	0	0	0	4	0	5	1	4	0	1	0	1	1	19	1	1	0	2	**57**	**43**
Trincomalee	15	90	0	6	0	1	0	0	0	0	0	4	1	2	0	0	0	0	0	9	0	1	0	0	**83**	**17**
Kurunegala	14	251	0	17	1	9	0	5	0	1	0	24	3	24	0	6	0	0	4	84	2	16	0	31	**81**	**19**
Puttalam	4	129	0	8	0	0	1	2	0	5	13	34	0	13	0	1	0	0	1	25	0	1	0	1	**46**	**54**
Anuradhapura	7	107	2	27	0	0	0	0	0	1	1	23	0	17	0	1	0	0	4	57	1	14	6	68	**74**	**26**
Polonnaruwa	0	60	0	10	0	1	0	0	0	0	0	8	0	0	0	1	0	0	0	17	0	1	0	15	**0**	**100**
Badulla	3	98	3	19	0	1	0	1	0	0	0	11	2	12	1	11	0	0	4	23	1	15	0	0	**76**	**24**
Monaragala	1	45	1	19	0	0	0	0	0	27	1	23	1	23	2	24	0	0	2	17	0	5	0	2	**82**	**18**
Ratnapura	2	125	2	29	2	4	0	3	0	4	4	57	2	22	10	72	0	0	2	34	1	5	0	8	**72**	**28**
Kegalle	11	140	4	29	0	2	1	9	0	1	3	29	2	15	0	17	0	0	3	57	1	14	0	1	**73**	**27**
Kalmune	1	24	2	30	0	0	0	3	0	6	0	1	0	0	0	0	0	0	6	30	0	1	0	0	**77**	**23**
SRILANKA	**325**	**5314**	**41**	**664**	**5**	**42**	**19**	**204**	**5**	**289**	**34**	**451**	**31**	**444**	**22**	**229**	**0**	**3**	**97**	**869**	**13**	**187**	**16**	**214**	**74**	**26**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 28th February , 2014 Total number of reporting units 337 Number of reporting units data provided for the current week: 251 **C****-Completeness

A = Cases reported during the current weethe year.

Table 2: Vaccine-Preventable Diseases & AFP

22nd – 28th Feb 2014 (09th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2014	Number of cases during same week in 2013	Total number of cases to date in 2014	Total number of cases to date in 2013	Difference between the number of cases to date in 2013& 2014
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	01	00	01	00	00	02	00	00	00	04	00	16	10	+60%
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	%
Mumps	02	00	00	05	00	00	00	00	03	10	13	149	250	-40.4%
Measles	31	00	15	00	00	08	05	01	10	70	03	815	54	+1409.2%
Rubella	00	00	00	00	00	00	00	00	00	00	-	01	-	%
CRS**	00	00	00	00	00	00	00	00	00	00	-	00	-	%
Tetanus	00	00	00	00	00	00	00	00	00	00	01	02	04	-50%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	-	00	-	%
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	-	16	-	%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	09	10	-10%
Tuberculosis	122	26	32	18	14	15	03	05	14	249	161	2052	1601	+28.1%

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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ON STATE SERVICE

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