WEEKLY EPIDEMIOLOGICAL REPORT

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Chikungunya – An update

Chikungunya virus infection among human beings is generally a non-fatal disease but is having severe short-term and long-term morbidity. In the African language – Swaahili, Chikungunya means '*the illness of the bended walker*'. This name itself describes the nature of the illness. The infection spreads rapidly and very widely among populations where there is no herd immunity. In Sri Lanka several outbreaks were experienced in 2007 and again in 2008. The loss of mobility, hand handicap due to involvement of tissues and joints of hand, and possible association of depressive mood with Chikungunya infection has a significant impact on the working population. The most affected will be those in low socio-economic strata as their livelihood will lose completely. Thus, Chikungunya can be responsible for long-lasting consequences in health of the community, social organization and the local economy of affected areas.

Since its first discovery in Tanzania in 1953, Chikungunya virus infection has been reported in many countries in Asia and Africa. Apart from imported cases, no outbreaks have been reported in Americas and Europe. However, economic prosperity will not protect a community getting vector borne diseases. On the contrary there could be an increased susceptibility since more developmental activities may lead to more changes to the ecosystem.

Vectors: Chikungunya is an arbovirus transmitted by mosquitoes. In Asia including Sri Lanka, the main vectors of Chikungunya virus are *Aedes aegypti* and *Aedes albopictus*. *A aegypti* is mainly responsible for the disease transmission in urban areas while in rural areas it is *A albopictus*. The vector responsible for recent outbreaks in Sri Lanka is also *A albopictus*.

A albopictus has a wide geographical distribution. It has the adaptability to live in both urban and rural environments. The mosquito eggs are highly resistant to adverse environmental conditions and can remain viable throughout the dry season, to complete the life cycle in the next rainy season. *A albopictus*, originated from Asia was sylvatic initially but has remarkably adapted to human beings and to urban and rural environments. Now it has become the most important secondary vector after *A aegypti* in transmission of dengue fever and other arboviruses. Introduction of the *A albopictus* to most new geographical locations has been caused by vegetative eggs contained in timber and tyres exported from Asia. This mosquito lives relatively a longer period (4-8 weeks) and has a flight radius of 400-600 m. It is an aggressive but silent mosquito with diurnal feeding habits. There is the possible vertical transmission of the virus from adult mosquito to her eggs. In the modern society, with construction of infrastructure facilities and irrigation systems in large quantities, modifications made on the ecosystem and generation of a large volume of solid waste has made it practically impossible to avoid bites by *A albopictus* or control its habitations. This is especially relevant to tropical countries.

Reservoirs: During epidemic periods human beings serve as the Chikungunya virus reservoir. In other periods the main reservoirs are other vertebrates, mainly monkeys, rodents and

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birds. It is reported that outbreaks could occur in monkeys when herd immunity is low. But generally viraemia in animals has no pronounced physical manifestations.

Epidemics: Chikungunya virus can be both endemic and epidemic. Usually outbreaks begin with the rainy season when vector density reaches its peak. The epidemic form of Chikungunya virus tends to be Asian and urban and is transmitted by both *A albopictus* and *A aegypti*. Mainly affected are the populations with low herd immunity. Abrupt and massive epidemics with high attack rates can occur. After the peak, there will be a gradual decline with an increasing proportion of the population developing the immunity.

Clinical manifestations: After the infection there will be an incubation period of about 2-4 days (range 1-12 days). Appearance of clinical symptoms is abrupt and include:

- High fever which can reach 39^0 C (102.2^0 F), often associated with intermittent shaking chills,
- Petechial or maculopapular rash, usually involving the limbs and trunk but face, palms and soles also can be involved,
- Arthralgia or arthritis affecting multiple joints, often involving small joints of hands, wrists, ankle and feet with pain on movement of joints. Large joints also can be involved.

In addition, there may be headache, conjunctival injections, slight photophobia, gingival bleeding and in children, a bullous rash with pronounced sloughing. Haemorrhagic fever also has been described occasionally. Relapsing and incapacitating arthralgia which is one of the predominant features of Chikungunya virus infections may affect as much as 80% of serologically confirmed patients but is rare among children. In many patients it may last 4 months or longer and in about 10% for 3-5 years.

Chikungunya virus infection is not generally considered to be a life-threatening disease; symptoms are usually of short duration (about one week). Fever typically lasts for two days and then the temperature comes down abruptly. Intense headache, insomnia and an extreme degree of prostration lasts for five to seven days and complete recovery follows. But in a proportion of patients it can cause severe disability mainly due to involvement of joints. Since recently in some epidemics there were cases which needed intensive care treatment, resulted in multi-organ failure, neurological complications or death.

Since dengue fever and Chikungunya can coexist in the same community, it is important to differentiate between the two diseases. In Chikungunya the onset of symptoms is more abrupt, duration of febrile phase is shorter. Maculopapular rashes, conjunctival injection and arthralgia are more prevalent in Chikungunya. Shock and gastrointestinal haemorrhages occur only in dengue fever. There is no organomegaly in Chikungunya.

Chikungunya virus in children: Attack rate of Chikungunya virus among children is less than that of adults. Severity of clinical manifestation is also lesser than in adults. Bullous rash seems frequent in children and the virus may be found in blister fluid.

Neonatal Chikungunya virus infection was first described in an epidemic in 2006, in the Indian Ocean island of Réunion. If the mother is ill at the time of the delivery, the newborn can get the infection, often severely. The possible risks of embryopathy, fetopathy and late sequelae are not properly known.

Biological diagnosis of Chikungunya virus infection: Two main diagnostic methods are available. They are RT-PCR and serology (IgM or IgG). RT-PCR is useful during the initial viraemic phase, i.e., day 0 to day 7. IgM is detectable after an average of 2 days by ELISA immunoflorescent assay (range 1-12 days) and may persists for several weeks to 3 months. IgG which appears with convalescence may persists for years. However, there may be false positive results resulting from cross-reactivity with dengue or other arboviruses.

Treatment: There is currently no effective antiviral treatment for Chikungunya. Therefore, treatments are purely symptomatic and are based on non-salicylate analgesics and non-steroidal anti-inflammatory drugs. Patients should take adequate rest and drink plenty of fluids. Movement and mild exercises will improve stiffness of joints but heavy exercises may exacerbate rheumatic symptoms. In unresolved arthritis refractory to NSAID, chloroquine 250 mg/day has been beneficial.

Specific immunity and vaccination: Long-lasting immunity seems to be possible following Chikungunya infection. Some candidate vaccines have been tested but there is currently no commercial vaccine for the virus. In one vaccine trial conducted by US Army Medical Research Institute, a satisfactory seroconversion of 98% on day 28 and persisting neutralising antibody titres in 85% of volunteers after 1 year has been obtained.

Prevention: As it appears that there are many years to come before a vaccine is in use, the only effective preventive measures consist of individual protection against mosquito bites and vector control. Adult mosquito and larval control measures do not differ from those in dengue control. Bednets should be used for patients and children. An effective surveillance system is an essential requirement for early detection of any outbreak.

The Editor wishes to acknowledge Dr Hasitha Tissera, Consultant Community Physician for the contribution made in compiling this article.

Table 1: Vaccine-preventable Diseases & AFP

24th - 30th January 2009 (05th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 CB=1	00	00	00	00	00	00	01 BD=1	00	02	00	07	07	00.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	-
Measles	00	00	00	00	00	01 PU=1	01 PO=1	01 MO=1	00	03	01	15	05	+200.0%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	04	03	+33.3%
Whooping Cough	00	00	01 GL=1	00	00	00	00	00	00	01	01	10	02	+400.0%
Tuberculosis	62	19	05	03	06	00	00	39	20	154	125	784	1037	-24.4%

Table 2: Newly Introduced Notifiable Disease

24th - 30th January 2009 (05th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	14	25	12	01	03	17	07	22	18	119	115	652	452	+44.2%
Meningitis	05 CB=2 GM=3	01 NE=1	01 MT=1	01 MN=1	00	05 KR=4 PU=1	00	01 MO=1	01 RP=1	15	33	96	184	-47.8%
Mumps	01	06	02	00	02	04	03	02	01	21	49	182	236	22.9%
Leishmaniasis	00	00	02 HB=1 MT=1	00	00	00	00	00	00	02	Not available*	30	Not available*	-

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.

Table 3: Laboratory Surveillance of Dengue Fever

24th - 30th January 2009 (05th Week)

Samples	Number tested	Number positive	Serotypes *				
			D1	D2	D3	D4	Negative
Number for current week	03	00	00	00	00	00	00
Total number to date in 2009	08	02	00	00	02	00	00

Sources: Genetic Laboratory, Asiri Surgical Hospital

* Not all positives are subjected to serotyping.

NA= Not Available.

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

24th - 30th January 2009 (05th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	29	246	2	20	1	2	3	30	0	7	1	32	0	0	0	5	0	1	**69**
Gampaha	17	115	0	12	1	3	1	4	4	5	3	21	1	1	4	13	0	0	**79**
Kalutara	10	63	7	53	0	2	3	9	0	0	1	15	0	0	0	2	0	0	**58**
Kandy	21	176	5	49	0	0	0	0	0	0	2	31	2	13	3	7	0	0	**56**
Matale	6	70	1	11	0	0	2	7	0	2	1	74	0	1	0	1	0	0	**50**
Nuwara Eliya	0	7	7	35	0	0	2	26	0	20	2	8	1	3	1	4	0	0	**77**
Galle	3	8	3	24	0	2	0	0	0	0	1	22	0	1	1	2	0	0	**84**
Hambantota	3	22	1	14	0	3	0	0	3	3	3	9	1	10	0	3	0	0	**73**
Matara	8	100	2	39	0	0	1	4	0	0	5	22	7	27	0	0	0	0	**88**
Jaffna	0	3	0	12	0	3	0	19	0	18	0	0	0	31	0	0	0	1	**0**
Kilinochchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Mannar	0	2	3	7	0	0	17	32	0	0	0	0	0	0	1	3	0	0	**50**
Vavuniya	0	2	0	3	0	0	0	1	0	0	0	2	0	0	0	0	0	0	**0**
Mullaitivu	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**0**
Batticaloa	4	10	0	24	0	5	0	3	2	5	0	0	0	0	0	1	0	0	**36**
Ampara	1	3	1	4	0	0	0	2	0	0	0	2	0	0	0	3	0	0	**29**
Trincomalee	6	8	0	7	0	1	0	0	0	0	0	0	0	2	0	2	0	0	**50**
Kurunegala	17	82	3	23	0	3	1	5	0	1	3	16	5	21	1	6	1	1	**79**
Puttalam	1	11	2	20	0	4	0	10	0	0	1	6	0	10	0	1	0	1	**56**
Anuradhapura	2	6	2	9	0	0	0	1	0	2	2	29	0	3	0	2	0	0	**47**
Polonnaruwa	2	7	0	8	1	1	1	4	0	0	2	26	0	0	1	1	0	0	**57**
Badulla	2	11	6	47	0	0	2	8	0	13	3	19	1	12	8	39	0	0	**80**
Monaragala	1	5	0	8	0	0	2	5	0	0	1	4	1	11	0	8	0	0	**91**
Ratnapura	7	27	8	44	0	4	5	10	0	0	1	5	1	2	0	1	0	0	**61**
Kegalle	17	96	0	13	0	1	1	5	0	1	1	15	1	4	2	16	0	0	**64**
Kalmunai	13	30	3	32	0	1	0	5	0	0	0	2	0	1	0	1	0	0	**46**
SRI LANKA	**170**	**1110**	**56**	**520**	**3**	**35**	**41**	**191**	**9**	**77**	**33**	**360**	**21**	**153**	**22**	**121**	**1**	**4**	**60**

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 06 February, 2009 Total number of reporting units =311. Number of reporting units data provided for the current week: 188
A = Cases reported during the current week. B = Cumulative cases for the year.

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