WEEKLY EPIDEMIOLOGICAL REPORT

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231, de Saram Place, Colombo 01000, Sri Lanka
Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@sltnet.lk
Epidemiologist: +94 11 2681548, E mail: chepid@sltnet.lk
Web: http://www.epid.gov.lk

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Guidelines on immunization of live attenuated JE vaccine SA14-14-2 (LJEV) Part I

Live attenuated SA14-14-2 Japanese Encephalitis vaccine was introduced to the National Immunization Programme (NIP) in Sri Lanka since 01st July 2009. This decision was made following recommendations made by the National Advisory Committee on Communicable Diseases held on 07. 03.2008.

Background

Japanese Encephalitis (JE) is caused by a zoonotic flavivirus. It is the most common arthropod borne (Mosquito- *Culex tritaeniorhynchus* group) encephalitis in the world. Further, it is considered as the leading viral cause of disability in many countries of South and South East Asia. In endemic areas, the highest attack rates occur in children with a case fatality rate of approximately 30%. Nearly a half of the survivors of JE suffer long term neuro-psychiatric sequelae. Therefore, it is obvious that the consequences of contracting the disease are drastic and invariably the impact of the disease upon the intellectual and productive capacity of a nation and economic burden is colossal.

In Sri Lanka, JE virus was first isolated in 1968. However, the first recorded major Japanese Encephalitis outbreak occurred in 1985-86 in the North Central Province where 385 cases were reported including 64 deaths accounting to a case fatality rate (CFR) of 17%. Predominantly affected in this outbreak were those who were in the age groups of 5-9 years and 20-29 years with a male: female ratio of 2:1. The disease occurred in epidemic proportions in 1986-87 and 1987-88 too. The latter outbreak was the largest outbreak reported so far with 812 cases and 192 deaths (CFR- 24%). In this outbreak, the disease had already spread to three new districts adjoining the North Central Province.

Epidemiologically, incidence of JE was high in areas of rice cultivation and well developed network of irrigation canals during the rainy season. Outbreaks of JE were spreading in areas that were associated with deforestation carried out to expand agricultural activities. Settlement drive had attracted a huge influx of non immunized people from various parts of the country encouraged by the state All these factors led to major outbreaks within the region. Pig breeding in closer proximity to residential areas providing amplifying hosts was found to be another disposing factor to the disease. Coir industry at household level was a reason for the spread of the disease in the wet zone. These dynamic changes in conditions receptive to viral transmission have been the key in changing the pattern of JE transmission in Sri Lanka.

Although various control and preventive measures were carried out, JE was endemic in certain areas of Sri Lanka and is gradually becoming prevalent in new areas where low levels of enzootic transmission was previously maintained.

Based on experience of some countries, immunization was the main cost effective public health tool to cope with this emerging challenge. Immunization against JE with mouse brain derived killed JE vaccine was introduced on phase basis in 1988 in Sri Lanka (in selected high endemic districts). The target group identified for immunization was children in the age group of 1-10 years and they were vaccinated with four doses of the Nakayama strain of the killed JE vaccine during the inter epidemic period. Immunizing with the Nakayama strain of the killed JE vaccine continued till 1992,when the Ministry of Health shifted from vaccinating with this vaccine to the Beijing strain.

As the immunization coverage increased over the years, the incidence of JE gradually started to decline in the districts where immunization was performed. Unfortunately the disease started to emerge in other districts where immunization was not performed. The last outbreak of JE was reported in Ratnapura in 2002. Since these areas which had previously low or non existent enzootic viral transmission reported JE in outbreak proportion, the expansion of immunization as the major means of prevention to these districts was imperative. Therefore, based on new epidemiological data, a

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decision was made to expand the JE vaccination programme to districts such as Ratnapura and Jaffna . Subsequently, immunization against JE was carried out in altogether 18 districts in Sri Lanka.

As the immunization coverage took an upward trend following introduction of the JE immunization programme, rate of adverse events following immunization (AEFI) reported to the Epidemiological Unit for the this vaccine also increased. Although improved reports of AEFI in the country was attributed to the observed increase to a certain extent, reactogenicity of the killed JE vaccine previously used in the national programme also has played a major role in this regard.

Meanwhile, the WHO's Strategic Advisory Group of Experts (SAGE) had recommended the live, attenuated SA 14-14-2 JE vaccine (LJEV) as an adequately immunogenic and safer vaccine than the killed JE vaccine and an appropriate alternative for the killed JE vaccine. Recommendations were based on studies done in some countries and China's experience of using live JE vaccine for a very long period in their immunization programme was citied as an example.

Live attenuated JE vaccine (LJEV) SA 14-14-2:

Introduction:

Live JE vaccine is manufactured based on growth of genetically stable, neuro attenuated SA 14-14-2 strain of the JE virus on a mono layer of primary hamster kidney cells. After cultivation and harvest, an appropriate stabilizer is added to the virus suspension and then lyophilized. Lyophilized vaccine has to be reconstituted with the dilluent provided by the manufacturer before administration. It elicits broad immunity against heterologus JE viruses with sufficient viral replication.

Schedule

Children will be immunized with the LJEV at the completion of the first birthday (one year).
Though in certain other countries, a further booster dose is given one year after the primary immunization given at the completion of first birthday, many studies suggest that the immunogenicity given by a single dose is equivalent to that when these two vaccines are given separately. Based on these data, a single dose is recommended to be used in Sri Lanka. However based on epidemiological data of JE and the effectiveness of the vaccine after being used in Sri Lanka, the necessity for a booster dose will be decided in the future.

If due to any reason, the vaccine is missed or delayed on the due date, it should be given at the next earliest available opportunity for immunization. However if another live vaccine is to be given before or after this vaccine there should be a time gap of at least four weeks between the two vaccines.

Eligible children for live JE vaccine

There will be two groups of children eligible for immunization with LJEV

1. **Those who complete one year on and after the commencement of immunization against JE with LJEV :**

The date of commencement of the JE immunization with the LJEV is July 01,2009. Therefore, all children who complete one year of age on and after July 01, 2009 will be eligible to receive live JE vaccine.

2. **Those who completed one year of age in 2006, 2007,2008 without being exposed to JE vaccination at all.**

Due to non availability of vaccine, killed JE vaccines was not provided to eligible children in 2007, 2008. Therefore, it is suggested that the backlog of children in these 3 cohorts also be cleared by offering vaccination with LJEV at the earliest point of contact based on the availability of LJEV.

For this purpose, all those children who were born in 2005, 2006 and 2007 and those who were born till July 01, 2008 should be considered for backlog clearance.

Dose

The recommended dosage is 0.5ml of reconstituted vaccine.

Route and site of administration

LJEV should be administered subcutaneously to the outer mid thigh or upper arm depending on the age of the child.

Contraindications

There are only a few reasons to withhold or to postpone administration of live JE vaccine. General contraindications to vaccination specified in the Immunization Handbook issued by the Epidemiology Unit in 2002 are applicable to the LJEV as well. However, in specific instances given below, it should be avoided.

It should be avoided only for children with;

- Fever more than 38.5 ^{0}C
- Acute infectious diseases including Otitis media, and tympanitis
- Active untreated tuberculosis
- Hepatic, renal or cardiac diseases
- Subjects with an allergy to any component of the LJEV vaccine including Gelatin
- Person with a proven or suspected hypersensitivity to Kanamycin or gentamicin
- Congenital or acquired immunodeficiency states including those who were treated with any immunosuppressive therapy recently
- Pregnancy
- Past history of convulsions

Please note that subjects with a previous history of moderate to severe allergic conditions (urticarea, dyspnoea, peri-oral oedema, laryngeal oedema) should be vaccinated in the central immunization clinic with an emergency tray and procedures for emergency care being ready.

The following are NOT contraindications:

- Minor illnesses such as respiratory tract infection or diarrhea with temperature below 38.5^{0}C (101^0 C)
- Family history of convulsions
- Treatment with topical corticosteroids or systemic use of corticosteroids at low dosages (less than 0.5mg/kg of prednisolone or equivalent) in case of skin diseases like dermatitis, eczema or other localized skin disorders
- Stable neurological conditions e.g. cerebral palsy, down syndrome.

Precautions:

Precautions should be taken to avoid undesirable reactions before administering the vaccine. These precautions include review of the child's medical history, particularly regarding hypersensitivity reactions to previous administration of any type of vaccine, past history of convulsions and the child's history of recent health problems.

There should be a gap of at least four weeks between the live JE vaccine and another live vaccine administered before or after the live JE vaccine.

Part II of this article will be published in next issue of WER.
(WER team wishes acknowledge the contribution of Dr. Ranjan Wijesinghe, Consultant Epidemiologist, in preparing

to be continued in volume 35

Table 1: Vaccine-preventable Diseases & AFP

08th-14th August 2009 (33rd 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	00	00	00	00	00	00	00	00	00	00	04	49	64	-23.4%
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	00	-
Measles	00	00	00	07	00	00	00	00	00	07	03	99	84	+17.9%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	18	25	-28.0%
Whooping Cough	00	00	00	00	00	00	00	01	00	01	03	37	29	+27.5%
Tuberculosis											205		5733	%

Table 2: Newly Introduced Notifiable Disease

08th-14th August 2009 (33rd 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	04	10	08	60	11	04	03	02	07	109	67	11641	3536	+229.2%
Meningitis	01	03	02	01	04	02	03	00	03	19	15	685	903	-28.4%
Mumps	01	04	02	03	10	01	02	04	00	27	113	1231	1833	-24.1%
Leishmaniasis	00	01 ML=1	01 GL=1	01 VU=1	00	00	02 AP=2	00	00	05	Not available*	496	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 4: Surveillance of Communicable diseases among IDP's

08th-14th August 2009 (33rd Week)

Area \ Disease	Dysentery	Enteric fever	Viral Hepatitis	Chicken Pox	Watery Diarrhoea
Vavunia	0	8	8	38	-
Chendikulam	23	12	25	187	452
Total	**23**	**20**	**33**	**225**	**452**

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

08th-14th August 2009 (33rd 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	94	3132	10	140	0	9	3	128	0	42	9	372	0	5	4	82	0	4	**85**
Gampaha	86	2919	2	112	1	18	0	31	0	13	6	204	0	7	10	90	0	2	**73**
Kalutara	22	1187	6	250	0	9	1	45	0	43	0	166	0	1	4	53	0	2	**75**
Kandy	99	3286	8	208	0	5	0	22	0	54	6	160	5	122	7	77	0	0	**84**
Matale	65	1299	3	82	0	2	0	26	0	6	9	279	0	5	7	50	0	2	**100**
Nuwara Eliya	4	204	6	339	0	2	3	146	4	786	1	30	0	56	2	60	0	0	**92**
Galle	27	440	4	176	0	10	1	3	0	22	3	112	2	8	2	22	0	3	**100**
Hambantota	28	736	3	68	0	8	0	6	0	11	1	54	0	58	8	37	0	0	**100**
Matara	32	915	3	209	0	4	0	4	0	16	3	106	5	96	4	40	0	1	**100**
Jaffna	0	10	0	82	0	3	1	190	0	28	0	0	0	124	0	144	0	2	**25**
Kilinochchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
Mannar	0	4	3	60	0	1	0	88	0	4	0	0	0	0	3	50	0	0	**75**
Vavuniya	2	17	6	1410	3	21	15	237	0	2	0	3	0	2	38	3363	0	0	**75**
Mullaitivu	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**00**
Batticaloa	12	490	2	190	0	12	1	11	0	50	0	9	0	2	0	17	1	4	**82**
Ampara	2	203	0	32	0	0	0	10	0	8	0	9	0	2	2	19	0	0	**57**
Trincomalee	3	316	3	78	0	2	0	4	0	1	1	17	0	19	2	35	0	1	**70**
Kurunegala	91	2248	4	128	0	8	1	47	0	9	5	74	0	62	4	94	0	4	**75**
Puttalam	26	499	7	116	0	7	2	61	0	2	2	66	1	31	3	23	0	1	**89**
Anuradhapur	9	471	0	81	0	4	0	5	17	20	1	79	1	28	9	126	0	2	**68**
Polonnaruwa	8	132	1	26	0	2	0	20	0	6	0	55	0	9	6	48	0	0	**86**
Badulla	19	245	4	184	0	2	1	33	0	19	4	72	6	87	7	249	0	1	**80**
Monaragala	4	129	14	67	0	1	2	23	0	12	0	13	2	54	1	71	0	1	**82**
Ratnapura	67	1644	5	381	0	18	2	42	0	5	6	185	1	30	1	101	0	1	**89**
Kegalle	65	3195	0	123	0	7	2	32	0	6	5	144	0	23	6	161	0	1	**73**
Kalmunai	3	154	0	77	0	1	0	13	0	3	0	2	0	3	0	15	0	0	**69**
SRI LANKA	**768**	**23875**	**94**	**4621**	**04**	**156**	**35**	**1228**	**21**	**1168**	**62**	**2211**	**23**	**834**	**130**	**5027**	**1**	**32**	**79**

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 14th August, 2009 Total number of reporting units =311. Number of reporting units data provided for the current week: 247
A = Cases reported during the current week. B = Cumulative cases for the year.

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ON STATE SERVICE

Dr. P. PALIHAWADANA
CHIEF EPIDEMIOLOGIST
EPIDEMIOLOGY UNIT
231, DE SARAM PLACE
COLOMBO 10