WEEKLY EPIDEMIOLOGICAL REPORT
A publication of the Epidemiological Unit,
Ministry of Healthcare & Nutrition
231, de Saram Place,Colombo 01000, Sri Lanka
Tele:(+94-011)2695112,Fax:(+94,011) 2696583,E-Mail:epidunit@sltnet.lk
Epidemiologist:(+94-011) 2681548,E-mail:chepid@sltnet.lk

Vol. 34 No. 39 22nd - 28th September 2007

WER Sri Lanka - 2007

Haemophilus influenzae type b - [Hib] Vaccine

Hib disease is preventable. Highly effective vaccines have been available since the early 1990s. Yet hundreds of thousands of children die year after year from Hib disease.

The two major obstacles for prevention of Hib disease are lack of information and poverty. The information shortage is largely due to the difficulty of diagnosing Hib disease — it claims most of its victims without ever being recognized. In addition, Hib vaccine is more expensive than classic childhood vaccines — at the price offered to the world's lower income nations in 2005, it costs roughly seven times the total cost of vaccines against measles, polio, tuberculosis, diphtheria, tetanus, and pertussis.

These two factors have placed many developing countries in a difficult situation. They want evidence of the extent and damage caused by Hib before deciding to add an expensive vaccine to their infant immunization programmes. Developing countries may also need external funding assistance if they decide to provide vaccination against Hib.

World Health Organization (WHO), recognizing these obstacles, recommends Hib vaccine "where resources permit its use and the burden of disease is established".

Industrialized countries, with sophisticated health-surveillance systems, became aware of the threat posed by Hib as far back 50 years ago. Before immunization programmes began in the early 1990s, Hib was demonstrated to be the leading cause of childhood bacterial meningitis in nearly all countries including Australia, Canada, Finland, the Netherlands, Sweden and the United States of America where appropriate studies were performed. Systematic vaccination has now virtually eliminated Hib disease in industrialized nations.

Unlike measles, polio or diphtheria, Hib does not cause a specific illness with which it alone, can be identified. The most deadly forms of Hib infection include pneumonia and meningitis, but these diseases can have other causes, and can appear the same whether caused by Hib or some other agent. More rarely, Hib is responsible for other life-threatening complications in young children, such as septic arthritis, an inflammation of the joints, and septicaemia, or blood poisoning, all of which also can have other causes.

Doctors who are treating cases of childhood pneumonia or meningitis tend to respond quickly with antibiotics in an effort to save lives. To confirm a case of Hib, however, samples must be taken from an ill child — a blood specimen in the case of pneumonia and a spinal-fluid specimen by lumbar puncture in the case of meningitis— and the bacteria must then be isolated from these specimens in a laboratory, which is a challenge even for well equipped laboratories. In developing countries, such tests may not be available at all, or laboratories may fail to carry them out correctly, or Hib's presence may be masked because antibiotics were given before the samples were taken. The hidden nature of Hib means its impact is often underestimated. Studies have shown a lack of awareness of Hib among medical professionals in some developing countries, or have shown that they associate Hib only with meningitis —

Contents **Page**

pneumonia occurs five times as frequently in such countries.

Vaccines are the only public health tool that can rapidly effect dramatic declines in the incidence of Hib disease both in developed and developing countries. Serious Hib disease has been practically eliminated within a few years in most countries where immunization against it has been introduced into the national immunization programmes. Preventing Hib disease through immunization has become more important than ever owing to the increasing bacterial resistance observed to some of the most effective antibiotics.

Hib conjugate vaccines : The Hib vaccines currently licensed for use in infants consist of polyribosylribitol phosphate (PRP) (the capsular polysaccharide of Hib) conjugated to a protein carrier. When conjugated, the carrier protein induces a T-cell dependent B-cell immune response to the polysaccharide. The vaccines are formulated either as single antigens or as part of combination vaccines. Hib vaccines are safe and efficacious even when administered in early infancy. So far, immunization against this disease has reached only a fraction of the children living in low-income countries.

All Hib-containing vaccines should be stored at between +2 ° C and +8 °C. Liquid Hib vaccine should never be frozen.

Immunogenicity, efficacy and effectiveness : A PRP antibody concentration of >0.15µ g/ml is considered to be a serological marker for short-term protection; concentrations ≥ 1.0 µg/ml 1 month after the completion of primary immunization are considered to be markers of long-term protective immunity against invasive Hib disease. Although these markers were derived from studies on recipients of the previously available capsular PRP vaccine, the same serological thresholds are still used. However, since immunological memory and antibody avidity maturation are important aspects of immunity induced by conjugate vaccines, these markers may not be as applicable to recipients of conjugate vaccine as to recipients of the old polysaccharide vaccine. The conjugate Hib vaccines currently licensed for immunization of infants induce protective circulating antibodies and immunological memory in all age groups. Hib vaccination also reduces nasopharyngeal colonization with the organism, leading to substantially greater reduction in disease incidence than can be directly attributed to the effects of the vaccine. This indirect effect (herd immunity) has been amply demonstrated in several post-introduction effectiveness studies in which near-elimination of the disease occurred in both industrialized and developing countries, even when vaccine coverage was suboptimal. The duration of protection following completion of primary Hib immunization is poorly defined, and it is likely to vary according to factors such as age at vaccination, ethnicity, immune competency and natural boosting. However, in most cases primary immunization is protective during the years of highest susceptibility to invasive Hib disease. Thus, 5 years after Hib vaccination was introduced into the Gambian childhood immunization programme in 1997, the annual incidence of Hib meningitis in children aged <5 years declined from 60 cases/100 000 to zero. During the same period, the prevalence of nasopharyngeal Hib carriage among children aged 1–2 years dropped from 12% to 0.25%.

Adverse Reactions Following Vaccination : Adverse reaction following Hib conjugate vaccines are very rare. Swelling, redness, or pain have been reported in 5%–30% of recipients and these usually resolve within 12–24 hours. Systemic reactions such as fever and irritability are infrequent. Serious adverse reactions are rare.

Vaccination of Older Children and Adults: In general, Hib vaccination of persons older than 60 months of age is not recommended. The majority of older children are immune to Hib, probably from asymptomatic infection as infants. However, some older children and adults are at increased risk for invasive Hib disease and may be vaccinated if they were not vaccinated in childhood. These include those with functional or anatomic asplenia (e.g., sickle cell disease, postsplenectomy), immunodeficiency (in particular, persons with IgG2 subclass deficiency), immunosuppression from cancer chemotherapy, infection with HIV, and in receipt of a hematopoietic stem cell transplant (HSCT). Previously unvaccinated persons older than 60 months of age with one of these high-risk conditions should be given at least one pediatric dose of any Hib conjugate vaccine.

WHO position on Hib vaccines : In view of their demonstrated safety and efficacy, conjugate Hib vaccines should be included in all routine infant immunization programmes. Since serious Hib disease occurs mainly in children aged between 4 months and 18 months, immunization should start as early as possible after the age of 6 weeks. In countries where the vaccine is being introduced, consideration should be given to offering one-time immunization to all eligible children aged 24 months. The impact of intensified immunization efforts will be particularly significant in the developing world, where limited medical resources aggravate the burden of Hib disease. Several studies have documented the cost effectiveness of Hib vaccination in developing countries. However, the relatively high price of the vaccine remains an important barrier to its introduction in countries with limited resources.

Sources :

1. *H. influenzae* type b (Hib) – WHO, Fact sheet N°294, December 2005. [F:\HIB\WHO Haemophilus influenzae type B (HiB).htm]

2 . Weekly Epidemiological Record **No. 47, 2006; 81**: 445–452. [http://www.who.int/wer]

Part III of this article series on H. influenzae type b will discuss issues related to introduction of Hib vaccine into the national EPI Programme.

Table 1: Vaccine-preventable Diseases & AFP

15th - 21st September 2007 (38th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	01 RP=1	01	01	63	90	-30.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	01	02	00	00	03	00	52	29	+79.3%
Tetanus	00	00	00	00	00	00	00	00	00	01	26	37	-29.7%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	32	65	-50.8%
Tuberculosis	114	02	05	33	00	00	00	00	154	96	7504	7352	+2.1%

Table 2: Diseases under Special Surveillance

15th - 21st September 2007 (38th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	86	03	13	01	22	10	03	22	160	168	4155	7686	-45.9%
Encephalitis	00	00	01 GL=1	00	00	00	00	00	01	00	152	92	+65.2%
Human Rabies	00	00	00	00	01 KR=1	00	00	00	01	01	50	48	+4.2%

Table 3: Newly Introduced Notifiable Diseases

15th - 21st September 2007 (38th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Total number of cases to date in 2007
	W	C	S	NE	NW	NC	U	Sab		
Chickenpox	08	09	14	08	05	00	05	08	57	2514
Meningitis	09 GM=4 KL=5	01 ML=1	03 MT=2 HB=1	01 KM=1	01` PU=1	01 PO=1	01 BD=1	06 RP=4 KG=2	23	452
Mumps	13	01	02	09	11	02	01	04	43	1499

*DF / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.
NA= Not Available.

Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

Provinces: W=Western, C=Central, S=Southern, NE=North & 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.

Table 4: Laboratory Surveillance of Dengue Fever

15th - 21st September 2007 (38th Week)

Samples	Number tested	Number positive *	Serotypes				
			D_1	D_2	D_3	D_4	Negative
Number for current week	05	00	00	00	00	00	00
Total number to date in 2007	415	42	01	21	12	00	07

Source: Genetech Molecular Diagnostics & School of Gene Technology, Colombo. * Not all positives are subjected to serotyping.

Table 5: Selected notifiable diseases reported by Medical Officers of Health

15th - 21st September 2007 (38th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Re-ceived Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	50	1128	08	291	00	09	00	56	06	62	03	105	00	03	03	113	**92**
Gampaha	22	476	00	272	00	22	02	59	00	45	03	168	00	14	01	156	**86**
Kalutara	14	280	08	379	00	04	00	37	03	35	07	93	00	01	00	51	**100**
Kandy	03	312	03	234	00	03	01	52	01	09	00	65	00	62	22	1842	**86**
Matale	00	81	07	171	00	06	02	21	00	12	01	44	00	05	01	118	**67**
Nuwara Eliya	00	35	02	210	00	02	00	103	00	368	00	08	00	30	14	483	**86**
Galle	01	73	04	137	01	10	00	18	02	39	07	51	01	25	01	16	**94**
Hambantota	04`	57	04	138	00	06	01	21	00	17	01	35	02	47	01	18	**91**
Matara	08	131	10	248	00	08	01	33	00	24	06	152	03	182	00	27	**100**
Jaffna	00	51	01	145	00	02	03	364	00	07	00	00	01	82	00	20	**75**
Kilinochchi	00	01	00	00	00	00	00	05	00	00	00	00	00	02	00	04	**25**
Mannar	00	07	00	15	00	00	00	65	00	00	00	02	00	00	00	11	**50**
Vavuniya	00	17	00	40	00	04	00	14	00	51	00	02	00	00	00	08	**100**
Mullaitivu	00	00	00	24	00	08	00	20	00	01	00	00	00	00	02	12	**80**
Batticaloa	01	73	01	449	00	09	00	18	00	10	00	00	00	22	44	993	**73**
Ampara	00	03	01	79	00	00	00	03	00	00	00	02	00	01	00	25	**29**
Trincomalee	00	54	11	210	00	03	00	23	00	23	00	10	01	14	03	102	**78**
Kurunegala	20	491	09	350	00	06	01	55	03	28	07	29	00	35	03	64	**83**
Puttalam	02	105	08	105	00	11	00	69	00	04	01	22	00	06	01	73	**56**
Anuradhapura	10	152	04	90	00	08	00	20	01	16	01	19	00	18	00	37	**68**
Polonnaruwa	00	53	03	75	00	02	01	11	00	04	00	20	00	00	01	36	**100**
Badulla	01	47	05	463	00	02	02	75	00	10	01	45	02	132	06	280	**60**
Monaragala	02	34	03	272	00	02	01	46	03	21	00	40	00	64	01	37	**80**
Ratnapura	07	292	04	459	00	16	00	55	02	19	00	51	01	23	00	81	**69**
Kegalle	15	199	02	232	00	08	02	42	00	04	02	87	01	32	06	174	**73**
Kalmunai	0	03	07	162	00	01	00	08	01	07	00	01	00	02	02	103	**69**
SRI LANKA	**160**	**4155**	**105**	**5250**	**01**	**152**	**17**	**1293**	**22**	**816**	**40**	**1051**	**12**	**802**	**112**	**4884**	**78**

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 29 September. 2007. Total number of reporting units =290. Number of reporting units data provided for the current week: 204

PRINTING OF THIS PUBLICATION IS FUNDED BY THE UNITED NATIONS CHILDREN'S FUND (UNICEF).

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.

ON STATE SERVICE

Dr. M. R. N. ABEYSINGHE
EPIDEMIOLOGIST
EPIDEMIOLOGICAL UNIT
231, DE SARAM PLACE
COLOMBO 10