WEEKLY EPIDEMIOLOGICAL REPORT
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Meningococcal vaccine for Hajj Pilgrims

The pathogen

Meningococcal meningitis and septicaemia are caused by various serogroups of *Neisseria meningitidis*. It is mostly caused by meningococci of serogroups A, B, C, X, Y and W-135. Prevalence of the varying serogroups varies with the time and location. Serogroup A meningococcus is the predominant cause of large epidemics in the so-called African meningitis belt. *Neisseria* species usually reside asymptomatically in the nasopharynx of humans (4-35% of healthy adults are carriers of *Neisseria*) and are easily transmitted to close contacts via respiratory droplets.

The burden of disease

Neisseria meningitidis is a leading cause of meningitis and fulminant septicaemia and a significant public health problem in most countries. Although meningococcal disease frequently occurs as scattered, apparently unrelated cases or in small outbreaks, in some regions this endemic situation may alternate with devastating, unpredictable epidemics. Thus, during explosive epidemics in sub-Saharan Africa, incidence rates of up to 1000 cases per 100 000 inhabitants have been reported. In 1996, an epidemic involving several West African countries caused approximately 250 000 cases and 25 000 deaths. Another major epidemic in this region occurred in 2000-2001. Globally, about 500 000 cases and 50 000 deaths are caused by *Neisseria meningitidis* each year. *Neisseria meningitidis* outbreak that occurred in Hajj pilgrims in 2001 was spread by pilgrims to countries as far as China and Latin America.

Sri Lankan situation

Around 4000 Sri Lankans Hajj pilgrims visit Mecca every year and it is mandatory for them to get the meningococcal vaccine before they embark on pilgrimage. The rationale for this is to assure the safety of pilgrims by preventing morbidity and mortality due to the disease as mentioned above, and to prevent outbreaks in Sri Lanka similar to the documented outbreaks which occurred in China and Latin America in 2001 (Routine vaccination against Meningococcus is not carried out in Sri Lanka and therefore the chances of it spreading rapidly is high).

The Disease

The endemic disease occurs primarily in children and adolescents, with highest attack rates occurring in infants aged 3-12 months. In epidemics, the attack rates rise in older children and young adults too.

Overcrowding, tobacco smoking, asplenia, HIV infection and host genetic factors (e.g. deficiencies in terminal complement component) are considered as risk factors for the disease. Travel to epidemic areas is also considered as a risk factor and it is evident by the outbreaks of *Neisseria meningitidis* in Hajj pilgrims in 1987 and 2001, and these outbreaks are considered as good examples of transmission of *Neisseria meningitidis* under crowded conditions.

The first step of the disease process is attachment of the organism to the epithelial cells of the nasopharynx, and the organism proliferates to form micro colonies there. Then the organism crosses the mucosal surface and enters the blood stream and causes systemic infection. It may multiply rapidly in the blood and may cross the blood brain meningeal barrier and enter the Central Nervous System (CNS) and cause meningitis.

Clinical Features

Symptoms of invasive meningococcal Disease (IMD) usually occur 1-4 days after colonization of the nasopharynx, but can occur upto 14 days after colonization.

It can cause meningitis (characterized by neck rigidity, myalgia, altered mental status and ataxia), septicaemia, arthritis, myocarditis, pericarditis and endophthalmitis. The characteristic feature of meningococcal septicaemia is haemorrhagic (i.e. petechial or purpuric) rash that does not blanch under pressure.

Sequelae

Most untreated cases of meningococcal meningitis and/or septicaemia are fatal. Even with appropriate care, at least 10% die typically within 24-48 hours of onset of symptoms. At least 10-20% of survivors are left with permanent sequelae such as mental retardation, deafness, epilepsy or other neurological disorders.

Diagnosis

The gold standard for diagnosis of IMD is isolation

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of Nisseria meningitidis from normally sterile body fluids (mostly blood/ CSF) or from purpural skin lesion scrapings. Isolation of the organism from nasopharynx is not diagnostic as it can be a part of normal nasopharyngeal flora. Chances of isolating *Nisseria meningitidis* in blood by culture or microscopy falls from 50% to 5% once IV antibiotics are started, and chances of isolating the offending organism from CSF using the same methods also decline fast after starting of antibiotics. Methods based on Polymerase Chain Reaction (PCR) can complement standard laboratory procedures as they are not affected by prior antibiotic therapy.

Treatment

Empirical therapy with Cefotaxime or Ceftrioxone should be started on suspicion and once the diagnosis is confirmed, treatment can be continued using Ceftrioxone or can be changed to IV Penicillin G.
A single dose of long acting Chloramphenicol or Ceftrioxone is used for the treatment of epidemic meningococcal meningitis in Sub-Saharan Africa. In countries where penicillin resistance is high (e.g. Vietnam), IM Chloramphenicol is the standard treatment.
Patients with septicaemic shock and raised intracranial pressure (with meningitis) need management in an Intensive Care Unit.

Natural Immunity

Bactericidal antibodies develop in response to nasopharyngeal carriage of *Nisseria meningitidis*, and development of disease is highly unlikely after 10-14 days of colonization. The antibody response to carriage is not limited to the strain being carried, but can provide cover from a host of heterologous strains such as A, B and C. This protection may last for several months after the carriage strain is no longer detectable. It is not clear whether natural immunization leads to immunological memory, and the protection conferred by natural immunization might not be absolute.

Immunity to systemic meningococcal infection in neonates is associated with passive transfer of IgG antibodies from mother to foetus and this may be suboptimal in preterm infants.

Prevention

Chemo-prophylaxis
Close contacts of a patient with invasive meningococcal disease are at an increased risk (risk is 400 to 800 times the risk of general population) of developing secondary disease. Clearance antibiotics are effective in preventing the development of disease in contacts by eradicating the carriage of invasive strain. Ideally prophylaxis should be started within 24 hours of identifying the index case. Close contacts including household contacts, child-care and pre-school contacts and any other person having direct prolonged contact should be offered clearance antibiotics such as Rifampicin, Ciprofloxacin, Ceftrioxone or Azithromycin.

Immunization
Both polysaccharide and polysaccharide-protein conjugate vaccines are available. Both types of vaccines are available against serogroups A, C, Y and W-135. Serogroup B vaccines are based on protein extracted from selected outbreak strains. Strain specific serogroup B vaccines have been used in some countries but are not widely available.

Current internationally marketed polysaccharide meningococcal vaccines are based on purified, heat stable and lyophilized capsular polysaccharides of the respective serogroups. They are available either in monovalent (e.g. A or C) or bivalent (e.g. A and C), trivalent (e.g. A, C and W-135) or quadrivalent (e.g. A, C, Y and W135). No adjuvants are included and these vaccines are administered as a single dose to individuals of/more than 2 years of age.

Conjugate meningococcal vaccines are currently either monovalent (e.g. A or C) or quadrivalent (e.g. A, C, Y and W-135). The protein conjugate of these vaccines consists either of diphtheria toxoid or non-toxic mutant of diphtheria toxoid or of tetanus toxoid.

Meningococcal Vaccine in Sri Lanka

A lyophilized preparation of purified polysaccharides from *Neisseria meningitidis* (meningococcus) of groups A, C, W135 and Y is available in SriLanka (A quadrivalent polysaccharide vaccine).

A single dose of this vaccine confers protection from *Neisseria meningitidis* infection for at least 3 years in adults, but specific antibody levels and clinical protection was found to decline rapidly over the first 2 to 3 years in children less than 4 years of age.

Storage and administration of the vaccine
Vaccines should be stored at 2-8° C. Administration should be done using subcutaneous route, preferably in the deltoid muscle, or in the antero-lateral aspect of the thigh in infants. It must not be mixed with other vaccines in the same syringe. In general, meningococcal vaccine can be administered simultaneously with other vaccines provided that the other vaccine is administered to a separate site.

Contraindications
Hypersensitivity to the active substances or to any of the excipients, or hypersensitivity reaction after previous administration of the same vaccine.

Precautions
Meningococcal vaccine is for subcutaneous use only, and should under no circumstances be administered intra-vascularly or intra-dermaly.

As with all injectable vaccines, appropriate medical treatment and supervision should always be readily available in case of anaphylactic reactions following administration of the vaccine.

Vaccination should be preceded by a review of medical history (especially with regard to previous vaccination and possible occurrence of undesirable events) and a clinical examination.

As with other vaccines, the administration of Meningococcal vaccine should be postponed in patients suffering from acute severe febrile illness. However, the presence of a minor infection, such as a cold, should not result in the deferral of vaccination.

Use in pregnancy
Adequate human data on use during pregnancy and adequate animal reproduction studies are not available. There is no convincing evidence of risk to the foetus from immunization of pregnant women using an inactivated bacterial vaccine. However, the vaccine should not be given to pregnant women unless the benefits to the mother clearly outweigh any risk to the foetus.

Use in Lactation
Adequate data on the administration of meningococcal vaccine to women who are breast-feeding is not available. However, as with other polysaccharide vaccines, it is not expected that vaccination with meningococcal vaccine would harm the mother or the infant. Meningococcal vaccine should be administered to women who are breast-feeding only when needed and when the possible advantages outweigh the possible risks.

Role of the MOOH/ General practitioners

MOOH/ General practitioners should educate the Muslim community regarding the importance of receiving meningococcal vaccine prior to Hajj pilgrimage. This can be done mainly through the mosques in the area.

A certificate of immunization should be issued to the recipient.
Any adverse events following immunization should be brought to the notice of the Epidemiology Unit

Source

WHO position paper on meningococcal meningitis, available from http://www.who.int/immunization/documents/positionpapers/en/index.html

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Table 1: Vaccine-preventable Diseases & AFP

15th– 21stOctober 2011 (42nd Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	01	00	00	00	01	01	75	68	+ 10.2 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Measles	00	00	00	00	00	00	01	00	00	01	02	112	86	+ 30.2 %
Tetanus	00	00	00	01	00	00	01	00	00	02	00	24	20	+ 20.0 %
Whooping Cough	00	00	00	00	00	00	01	00	00	01	00	46	28	+ 64.2 %
Tuberculosis	104	09	32	12	10	35	00	04	46	252	55	7527	8132	- 07.4 %

Table 2: Newly Introduced Notifiable Disease

15th– 21stOctober 2011 (42nd Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	13	09	14	02	04	04	06	06	10	73	50	3567	2820	+ 26.7 %
Meningitis	03 GM=1 CB=2	01 ML=1	02 GL=1 MT=1	01 JF=1	00	02 KN=2	00	00	05 RP=2 KG=3	15	15	724	1344	- 55.5 %
Mumps	08	04	12	10	07	04	00	08	16	69	17	2632	972	+ 170.7 %
Leishmaniasis	00	00	03 MT=3	00	01 TR=1	01 KN=1	12 AP=5 PO=7	00	00	17	11	670	318	+ 110.7 %

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. .

Dengue Prevention and Control Health Messages

Check the roof gutters regularly for water collection where dengue mosquitoes could breed.

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

15th– 21stOctober 2011 (42nd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	126	7914	0	166	0	6	28	243	0	58	13	386	0	8	0	60	0	2	**77**
Gampaha	71	3198	1	116	0	16	4	81	0	81	06	454	0	24	17	296	0	6	**67**
Kalutara	22	1084	2	145	0	9	6	72	0	26	5	330	0	3	1	10	0	1	**75**
Kandy	64	1040	3	347	0	7	1	36	0	40	5	156	0	98	1	49	0	0	**78**
Matale	5	283	5	161	0	4	1	33	1	23	1	154	0	14	0	11	0	0	**92**
Nuwara	3	189	4	308	0	4	1	55	0	89	0	50	0	63	1	30	0	1	**77**
Galle	2	715	5	98	0	6	2	26		7	5	199	0	39	0	10	0	5	**79**
Hambantota	4	355	1	58	0	4	0	4	0	29	1	482	2	58	1	15	0	1	**75**
Matara	6	453	3	80	1	3	1	16	0	31	9	329	3	74	1	21	0	1	**100**
Jaffna	3	290	14	290	0	3	5	241	1	85	0	2	0	195	1	29	0	1	**91**
Kilinochchi	1	54	3	33	0	3	1	10	0	13	0	2	0	11	0	3	0	0	**75**
Mannar	6	35	1	23	0	1	0	31	0	83	0	13	1	33	0	2	0	0	**100**
Vavuniya	0	70	1	33	0	12	0	10	0	56	0	45	0	2	0	1	0	0	**75**
Mullaitivu	0	16	0	60	0	1	1	5	0	9	0	5	0	1	0	2	0	0	**100**
Batticaloa	35	788	6	555	0	5	0	7	2	27	0	27	0	3	0	2	0	6	**71**
Ampara	4	144	10	192	0	1	0	11	0	47	0	57	0	1	0	8	0	0	**57**
Trincomalee	1	145	2	617	0	2	0	10	0	12	3	91	0	7	0	7	1	1	**83**
Kurunegala	19	798	5	312	0	12	4	91	2	85	13	1494	1	73	10	50	0	4	**78**
Puttalam	9	418	3	171	0	1	1	31	0	9	1	117	0	17	0	7	0	2	**50**
Anuradhapu	3	241	1	122	0	2	0	5	0	34	1	239	0	16	2	21	0	1	**74**
Polonnaruw	8	262	4	114	0	1	2	14	0	22	0	82	0	1	0	16	0	0	**57**
Badulla	14	519	8	324	0	6	1	52	0	24	0	74	2	81	1	58	0	0	**88**
Monaragala	8	231	4	117	0	4	1	35	0	13	0	179	1	71	1	78	0	0	**82**
Ratnapura	16	853	5	457	0	7	3	51	6	26	5	516	1	28	3	50	0	2	**78**
Kegalle	63	807	4	104	0	12	4	73	0	24	5	312	2	33	19	224	0	0	**82**
Kalmune	2	34	9	541	0	0	0	1	5	72	0	6	0	2	0	3	0	1	**77**
SRI LANKA	**495**	**20936**	**104**	**5544**	**01**	**132**	**67**	**1244**	**17**	**1025**	**73**	**5801**	**13**	**956**	**59**	**1063**	**01**	**35**	**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 21st October , 2011 Total number of reporting units =329. Number of reporting units data provided for the current week: 257
A = Cases reported during the current week. **B** = Cumulative cases for the year.

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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.**

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