

# CD Alert

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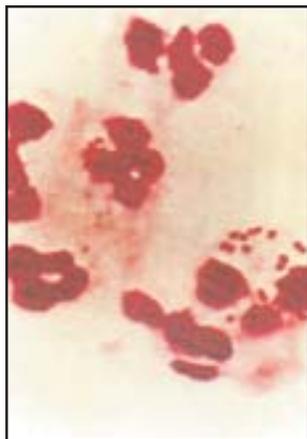
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## Meningococcal Disease : Need to remain alert

### INTRODUCTION

Meningococcal disease is an acute bacterial disease caused by meningococcus (*Neisseria meningitidis*), a gram negative capsulated coffee bean shaped bacteria seen usually in pairs. The disease was first described in 1805, when an outbreak occurred in Geneva, Switzerland and the causative organism was identified in 1887. The disease is manifested by sudden onset of fever, severe headache, nausea and vomiting, stiff neck and frequently a petechial rash with pink macules and very rarely vesicles often accompanied by delirium and coma. Occasionally, fulminating cases exhibit severe sudden prostration, ecchymoses and shock at onset. A small proportion of the cases progress to invasive disease, characterized by one or more clinical syndromes including septicaemia. Joints may also be involved causing arthritis. Meningococcaemia may occur with or without meningitis. Residual neurological sequelae are seen in 10-15% of cases.

Thirteen (13) serogroups of *N.meningitidis* have been identified based on capsular polysaccharide antigen i.e A, B, C, E, H, I, K, L, M, X, Y, Z, W135 and of these, four sero groups (namely A, B, C and W135) are known to cause epidemics. The pathogenicity, immunogenicity and epidemic potentials differ according to serogroup and its identification is crucial for containment of epidemic. Other serogroups eg X, Y, Z etc. are less virulent. However, fatal infections and secondary cases are known to occur with all the serogroups.



Epidemics of meningococcal disease can occur in any part of the world. However, the largest epidemics occur mainly in the semi-arid areas of sub-Saharan Africa, designated the “**African meningitis belt**”.

### MENINGOCOCCAL DISEASE: GLOBAL SITUATION

Meningococcal meningitis occurs globally as an endemic illness. The incidence of the disease during the last 30 years varies from 1-3/100,000 in most developed countries to 10-25/100,000 in the developing countries. Globally, nearly half a million cases of meningococcal disease occur each year accounting for 50,000 deaths. Sero group A meningococcus is responsible for sporadic cases and outbreaks in India, Africa and some other developing countries whereas groups B and C cause infections in the developed world. The disease is endemic in temperate climates with sporadic cases or a small cluster of cases and having a seasonal increase in winter and spring. A different pattern, with periodic epidemics covering large geographic area, has been observed in countries in sub-Saharan Africa. This area has experienced epidemic cycles every 8 to 12 years in the past, and the intervals between major epidemics have become shorter and more irregular since the beginning of the 1980s. During 1970-2000, a large number of epidemics of meningococcal disease have been reported from Africa, Asia, South and Central America & Europe.

### Recent Outbreaks of Meningitis in the World

- Asia has been the focus of some major epidemics of meningococcal disease in last 30-40 years viz China (1979, 80), Vietnam (1977), Mongolia (1973-74), Saudi Arabia (1987) and Yemen (1988). One of the largest outbreaks which originated in China and spread to other countries was caused by two clones of Group A meningococcus, one of these clones spread to the Indian subcontinent between 1983-87 and between 1987-1996. This clone travelled to Middle East causing many epidemics among Haj pilgrims.

- In 1985, Bhutan was hit by an epidemic of meningococcal disease in which 247 cases and 41 deaths were reported.
- New Zealand experienced an epidemic of Group B disease in 1990 reporting 53 cases during the year, the number of cases increased each year reaching 613 cases in 1997.
- In 1996, the largest outbreak ever reported occurred in the meningitis belt of sub-Saharan Africa involving many countries, wherein a total of more than 2,50,000 cases with more than 25,000 deaths were reported to WHO.
- In 2002, the great lake region was affected by outbreaks in villages and refugee camps which caused more than 2200 cases including 200 deaths.
- In 2000 and 2001, several hundred pilgrims attending the Haj in Saudi Arabia were infected with N.meningitidis W135.
- In 2002, W135 emerged in Burkina Faso where 130,000 people got affected and 1500 died.
- In 2009, (Jan-March) Nigeria reported outbreak of Group A meningococcal disease accounting for 17,462 cases and 960 deaths.
- Niger reported 4513 cases of meningococcal disease with 169 deaths during Jan-March 2009.

## INDIAN SCENARIO

Meningococcal disease is seen in practically all parts of the country, though in low numbers, with outbreaks of the disease occurring from time to time as given below. Serogroup A has been associated with all the outbreaks as well as sporadic cases. There are very few reports of occurrence of group B and C disease in the country as sporadic cases only. As far back as 1883, an outbreak of meningococcal meningitis was recorded in Shikarpur Jail, Rajasthan, though it was not laboratory confirmed evidently due to non availability of laboratory facilities at that time. Thereafter, the disease has been persisting as an endemic problem through out the country in the form of sporadic cases off and on with some major outbreaks occurring at regular intervals.

### Major outbreaks in the country

#### Outbreak in 1966, Delhi

During March 1966, an increased number of pyogenic meningitis cases were admitted in 5 major hospitals of Delhi. A total of 616 cases were recorded. The proportion of laboratory confirmed cases increased from 4.8% in January to 10.6% in February to reach a peak of 44.9% in May 1966. The outbreak was due to meningococcus.

Highest proportion of cases were seen in children below one year of age.

#### Outbreak in 1985-86, Delhi

After a gap of about 20 years, Delhi and adjoining areas (Faridabad, Gurgaon, Rohtak, Ghaziabad, Mathura and Bharatpur etc) experienced another outbreak of meningococcal meningitis in 1985-86. A total of 6133 meningitis cases with 799 deaths were recorded, with an overall case-fatality rate of 13%. The causative agent was identified as Serogroup A.

#### Outbreak in 1985-87, Surat (Gujarat)

An outbreak of meningococcal meningitis occurred in Surat (Gujarat) wherein 197 cases and 34 deaths were reported. The etiological agent was again meningococcus Serogroup A.

#### Outbreak in 1989, Andhra Pradesh

An outbreak of meningococcal disease was reported in three districts of the state, namely, Vishakhapatnam, Vijayanagram and Srikakulam. A total of 475 cases were reported in the state accounting for 108 deaths. The etiological agent was again found to be group A meningococcus.

#### Outbreak in 1989, Orissa

Another outbreak was reported in the nearby state of Orissa, wherein a total of 2951 cases of meningococcal disease accounting for 344 deaths were reported from three districts of the state, namely, Kalahandi, Kohlapur and Phulbani. The etiological agent was again found to be group A meningococcus.

#### Outbreak in 1989, Madhya Pradesh

More than 250 cases of meningococcal disease accounting for more than 75 deaths were reported during a period of 3 months starting Jan 1989 from the districts of Sagar, damoh, Chattarpur, Mandsaur, Ujjain, Satna, Shahjahanpur and Indore. The etiological agent was again found to be group A meningococcus.

#### Outbreak in 2005 onwards, Delhi

After nearly another 20 year gap, Delhi and surrounding areas witnessed another major outbreak of this disease in April 2005, accounting for 527 cases during 2005, cases further increased to 867 during 2006, thereafter there was a decline with only 380 cases in 2007 and 393 cases during 2008. The causative agent is Group A meningococcus. The cases are still being reported in 2009 in smaller numbers (only 85 cases till 20<sup>th</sup> Nov

2009). Majority of cases were seen in adolescents and young adults.

### Outbreak in 2008-09, Meghalaya

Since January 2008, the north eastern state of Meghalaya has been witnessing a large outbreak of meningococcal disease due to Gr A meningococcus accounting for more than 2100 cases and 260 deaths. Out of the seven districts of the state, four districts have been affected; however, the major brunt has been borne by East Khasi hills, Jaintia hill and West Khasi Hill districts. Again, majority of cases were seen in adolescents and young adults.

### Outbreak in 2009, Tripura

Since January 2009, another north eastern state Tripura is experiencing an outbreak of meningococcal disease due to Group A meningococcus. A total of 277 cases and 60 deaths have been reported so far, the major brunt being borne by Dhalai district of the state. Again, majority of cases were seen in adolescents and young adults.

## EPIDEMIOLOGY

The meningococci most often inhabit the human nasopharyngeal area without causing any symptoms or with only local symptoms. The disease may become invasive with involvement of meninges and presenting as acute purulent meningitis. The main epidemiological features of meningococcal disease are given in the box.

EPIDEMIOLOGICAL FEATURES OF MENINGOCOCCAL DISEASE	
<b>Reservoir</b>	Man, no extra human reservoir, 10-15% of healthy subjects harbour the bacterium in upper respiratory tract (Throat/Nose)
<b>Transmission</b>	Direct contact with droplets and discharges from nose and throat of patients and healthy carriers (mainly carriers). Infection usually causes only a sub clinical mucosal infection. Invasion sufficient to cause systemic disease is comparatively rare. Carrier prevalence rate up to 25% or more may exist without a case of meningitis.
<b>Incubation Period</b>	2-10 days (average 3-4 days)
<b>Seasonal Variation</b>	More in winter months or spring

<b>Age Group Affected</b>	Primarily a disease of very young children; occurs commonly in children or young adults. However, no age is exempt.
<b>Risk Factors</b>	Subjects with terminal complement component deficiency (C5-C9), properdin deficiency and asplenia are more prone. Poor living conditions and overcrowding are other contributory factors
<b>Case Fatality Rate</b>	10-15% usually, more in meningococcaemia and in delayed treatment case
<b>Period of Communicability</b>	Until meningococci are no longer present in discharges from nose and mouth, usually the first few days of illness
Considering the cyclic trend of meningococcal disease and recent occurrence of outbreaks in many parts of the world, which due to rapid travel can spread to any country, makes it mandatory for us to augment surveillance and observe strictest vigil for this disease and remain alert through continuing medical education.	

## LABORATORY DIAGNOSIS

### For meningitis

- CSF cytology shows increased WBC count with increased polymorphs
- CSF sugar decreased, protein increased
- CSF Gram stained smear shows gram-negative intracellular & extracellular diplococci. (ST=30-60%\*)
- CSF & blood culture may show growth of meningococcus (ST=50-70%\*)
- Meningococcal antigen in CSF detected by latex/co-agglutination test (ST=60-90%)
- Petechial fluid may show presence of meningococci
- CSF/Blood for PCR test for bacterial DNA

### For meningococcaemia

- Blood culture is the single most important investigation to show the presence of meningococci (ST=60-80%\*)
- Smears and culture from petechiae may reveal meningococci (ST=40-50%\*)
- Serum for antigen detection (ST= low)

### Meningococcaemia with meningitis

- Blood for culture, antigen detection and PCR test
- CSF for Gram stain, Culture, antigen detection and PCR test
- Petechial fluid for Gram stain and culture

Note: ST = sensitivity of test; \* In non antibiotic treated cases

## SAMPLE COLLECTION AND TRANSPORT

- **CSF:** 3-4 ml of CSF to be collected in a sterile screw capped bottle before start of chemotherapy and sent immediately to the laboratory. In case of delay, it should be stored/ transported at Room temp/ 37°C (The sample to be submitted for culture should never be refrigerated). Transport media like Stuart's and Amies media should be used.
- **Blood:** Blood should be collected preferably during first 4-5 days of illness, before starting chemotherapy (5-10 ml quantity in 50-100 ml Brain Heart infusion/ Trypticare soy broth). In case of delay, it should be stored at room temp/ 37°C. Avoid use of Liquoid and protect from direct sunlight and extremes of temperature. In case of non availability of broth media, 4-5 ml of blood should be collected in sterile plain vial for clot culture as well as antigen detection in serum sample.
- **Petechial fluid:** Lesions may be gently irrigated by injecting 0.2ml of sterile saline solution using a small syringe and a fine needle (23/24G) and thereafter aspirating the fluid for making smear and doing culture examination.

## Drug susceptibility testing/ profile of meningococcus:

Drug sensitivity testing of meningococcus by standard disk diffusion test is not recommended as the results are not reliable. Accordingly, the recommended method is by Agar Dilution /MIC method using Muellor Hinton Blood agar. Recently, a simplified MIC method using E test has also been internationally used and recommended.

Meningococcus was considered to be susceptible to all the known antimicrobials till few decades ago. In the 1960's, Sulfonamide resistance was reported in some countries. Since 1980's, decreased sensitivity to Penicillin was reported in several countries eg Spain, Greece, Romania etc. Later on, resistance to Chloramphenicol, Cotrimoxazole, Rifampicin and Ciprofloxacin were reported in many countries, though, there were no such reports from India.

During the recent outbreak of this disease in NCT of Delhi (April 2005-2008), many isolates of meningococcus showed resistance to Cotrimoxazole, Ciprofloxacin, Ofloxacin, Tetracycline and Vancomycin while, some of the strains depicted decreased susceptibility to Flouroquinolones, however, all were sensitive to Penicillin, Rifampicin, Ceftriaxone, Ampicillin, Chloramphenicol and Azithromycin.

Isolates obtained from outbreak in Meghalaya (2008-09), also showed a similar pattern depicting resistance to Ciprofloxacin, Cotrimoxazole and Tetracycline. Two

(2) isolates tested from outbreak in Tripura (2009) also showed a similar trend.

## Genotyping:

Genetic analysis (PFGE patterns) of the strains in Delhi outbreak (2005-08) showed that they are having identical pattern and are probably from common origin. Further genetic characterisation by MLST (Multi locus sequence typing) revealed that the strains are similar to the outbreak strains from Dhaka (Bangladesh) (2002) and Nigeria (2003).

## STANDARD CASE DEFINITION OF MENINGOCOCCAL MENINGITIS (WHO guidelines)

### 1. Suspected case of acute meningitis

- sudden onset of fever (>38.5°C rectal or 38.0°C axillary), WITH
- stiff neck

In patients under one year of age, a suspected case of meningitis occurs when fever is accompanied by a bulging fontanelle

### 2. Probable case of bacterial meningitis

- suspected case of acute meningitis as defined above, WITH
- turbid CSF

### 3. Probable case of meningococcal meningitis

- suspected case of either acute or bacterial meningitis as defined above, WITH
- Gram stain showing Gram-negative diplococcus, OR
- ongoing epidemic, OR
- petechial or purpurial rash

### 4. Confirmed case

- suspected or probable case as defined above, WITH EITHER
- positive CSF antigen detection for N. meningitidis, OR
- Positive culture of CSF or blood with identification of N. meningitidis

## STANDARD CASE DEFINITION OF MENINGOCOCCEMIA

**Probable:** Sudden onset of fever (>38.5°C rectal or 38.0°C axillary) with or without shock, and one of the following:

- i. Petechial or purpurial rash
- ii. Gram stain showing Gram negative diplococcus

**Confirmed:** Probable case, and Demonstration of N.meningitidis by culture or antigen detection in blood and/or CSF.

**Note: As per CDC guidelines, meningococcal antigen detection does not constitute a confirmatory diagnosis, it would be a probable diagnosis**

**Note: All probable or confirmed cases of Meningococcal meningitis or Meningococemia should be reported to**

- (i) Director (EMR), Tel: 23061469; Fax: 23061469
- (ii) Director, NCDC, Tel: 23971272, 23971060  
Fax: 23922677
- (iii) Toll Free No. 1075

## HOW TO RECOGNIZE AND CONFIRM MENINGOCOCCAL DISEASE?

### Symptoms and signs

#### Meningitis:

- Sudden onset of intense headache
- High fever
- Stiff neck
- Nausea and vomiting
- Photophobia
- Neurological signs like confusion, lethargy, delirium, coma, and/or convulsions
- Infants may have illness without any stiff neck and onset could be slow

#### Meningococcaemia:

- Abrupt onset
- Fever
- Shock
- Petechial rash or purpura may not be obvious initially and meningeal symptoms are usually absent
- Rapid circulatory collapse



Petechial rash

### Physical examination should include an examination for

- Meningeal rigidity, stiff neck, Kernig's or Brudzinski's signs
- Neurological signs such as decreased awareness; localizing neurological symptoms are unusual
- Purpura, sometimes extensive and necrotic, usually localized to the extremities, or generalized, cutaneous or mucosal (conjunctival) are often associated with meningococcal disease; purpura is a basic symptom of meningococcaemia
- Lowered blood pressure and symptoms of shock
- Shock associated with purpura indicates fulminating meningococcaemia, the most severe form of meningococcal disease
- Focal infection such as arthritis, pleuritis or pneumonia, pericarditis, episcleritis

**In infants (under one year of age),** the clinical features of meningitis are often atypical and may be difficult to recognize. The onset is not always rapid. In addition to fever, inconsolable irritability and screaming, failure to feed, vomiting, lethargy, convulsions or hypotonia may be presenting features. Stiff neck may be absent, bulging fontanelle may be observed.

The bacterial meningitis may result in brain damage, hearing loss or learning disability in 10-20% of survivors.

## HOW TO MANAGE PATIENTS WITH MENINGOCOCCAL DISEASE?

Meningococcal disease (either meningitis or septicaemia) is potentially fatal and should always be viewed as a medical emergency.

- Admission to a hospital or health centre is necessary for diagnosis (lumbar puncture and CSF examination) and for treatment.
- Antimicrobial therapy is essential and should be combined with supportive treatment.
- As contagiousness of patients is moderate and disappears quickly following antimicrobial treatment, isolation of the patient is not necessary except probably during the first 24 hours of illness.

### Antimicrobial therapy

Antimicrobial treatment must be instituted as soon as possible after the lumbar puncture has been carried out. Many antimicrobials are active against meningococci in vitro, but only those that sufficiently penetrate the cerebrospinal space and are affordable should be used. The range of antibiotics used for

treatment includes Penicillin, Ampicillin, Chloramphenicol and Ceftriaxone. Chloramphenicol is a good and inexpensive choice. The third generation cephalosporins, ceftriaxone and cefotaxime, are also very effective.

**Oily Chloramphenicol is the drug of choice in area with limited health infrastructure** as a single dose of this long acting formulation is found to be very effective.

The antimicrobials useful in the treatment of meningococcal disease are listed in the box.

ANTIBACTERIALS TO TREAT MENINGOCOCCAL DISEASE					
Agent (generic name)	Route	Dose		Duration (days)	Cost
		adults	children		
Penicillin G	IV	3-4 MU. 4-6 h	400,000 U/kg	≥ 4	low
Ampicillin or Amoxicillin	IV	2-3 g . 6 h	250 mg/kg	≥ 4	moderate
Chloramphenicol (Aqueous)	IV	1 g . 6 h	100 mg/kg	≥ 4	moderate
Cefotaxime	IV	2 g . 6 h	250 mg/kg	≥ 4	Expensive
Ceftriaxone	IV	1-2 g . 12-24 h	50-80 mg/kg	≥ 4	High
Oily Chloramphenicol	IM	Single Dose		1	low

### Supportive therapy

Fluid and electrolyte balance should be monitored and fluid replaced accordingly. When required, anticonvulsants or antiemetics may be administered. Severe forms of the disease including coma, shock, purpura should be treated in an intensive care unit by well trained physicians.

### HOW TO PREVENT MENINGOCOCCAL DISEASE?

Meningococcal disease is potentially preventable through avoiding close contact with cases or carriers of the disease/ agent, vaccination and/or chemoprophylaxis.

### Prevention of transmission

Transmission of N.meningitidis occurs from person to person, usually from a nasopharyngeal carrier rather than from a patient, through contact with respiratory droplets or oral secretions. Contagiousness rapidly disappears in patients after starting antibiotic therapy.

### Vaccination

Vaccines against four specific antigens related to serogroups A, C, Y and W135 are currently available. Vaccines against serogroup B are still being evaluated. Two types of vaccines are in use

- 1) Capsular polysaccharide vaccines and
- 2) Conjugate vaccines.

In our country, only polysaccharides vaccines are licensed for use. They are distributed in freeze-dried form. It is available as bivalent (A+C) and tetravalent forms (A+C+Y+W135). Vaccine contains 50 µg of each antigen. The dose of vaccine is **0.5ml given subcutaneously preferably in the deltoid region.**

These polysaccharide vaccines are generally very well tolerated but may induce some mild adverse reaction (local pain and swelling, fever and malaise) in 10-20 percent of recipients, for 2-3 days following the vaccination. Duration of immunity is 1-3 yrs.

Meningococcal polysaccharide vaccines are not routinely used in early childhood because of their general lack of efficacy in infants and young children below 2 years.

### Vaccination policy in the country

Meningococcal Vaccine is only recommended to be given to:

- Haj pilgrims and other travellers visiting the countries where meningococcal disease is a major problem or where outbreaks are co-occurring.
- High risk groups, eg children living in orphanages, jail inmates, soldiers in Barracks etc.
- Routine vaccination of the population at large is not recommended except during epidemic situations.

### Chemoprophylaxis

The aim of chemoprophylaxis is to prevent secondary cases by eliminating nasopharyngeal carriage.

Chemoprophylaxis has been considered for control of meningococcal disease but it has several limitations, and its use should be limited to special circumstances. **To be effective in preventing secondary cases, chemoprophylaxis must be initiated as soon as possible (i.e. not later than 48 hours after diagnosis of the case).**

<b>THE RECOMMENDED DRUGS FOR CHEMOPROPHYLAXIS</b>				
<b>Generic name</b>	<b>Dose Adults</b>	<b>Dose children</b>	<b>Route</b>	<b>Duration</b>
Rifampicin	600 mg/12h	10 mg/kg/12h	Oral	2 days
Ciprofloxacin	500 mg	Not given	Oral	Single dose
Ofloxacin	400 mg	Not given	Oral	Single dose
Ceftriaxone	250 mg	<15 yr – 125 mg	IM	Single dose
Azithromycin	500 mg	10mg/kg	Oral	Single dose
<b>Mass chemoprophylaxis to prevent/control epidemics is not recommended.</b>				

### Special circumstances for which chemoprophylaxis are appropriate:

In non-epidemic settings, chemoprophylaxis should be restricted to close contacts of a case, which are defined as:

- Household members (i.e. persons sleeping in the same dwelling as the case); institutional contacts who shared sleeping quarters (i.e. for boarding school pupils, room-mates; for military camps, persons sharing a barrack); nursery school or childcare centre contacts (i.e. children and teachers who share a classroom with the case).
- Others who have had contact with the patient's oral secretions through kissing or sharing of food and beverages.

In addition, in areas where household contacts routinely receive prophylaxis, chemoprophylaxis should also be given to the patient with meningococcal disease upon discharge from the hospital provided the patient's illness was treated with antibiotics (e.g. penicillin) which do not eliminate the organism from the nasopharynx.

### Meningococcal Disease and Haj Pilgrims

Visitors from all over the world arriving for the purpose of pilgrimage are required to produce a certificate of vaccination against meningitis issued not more than 3 years and not less than 10 days before arrival in Saudi Arabia.

- Adults and children over the age of two years must be given one dose of quadrivalent vaccine (A+C+Y+W135).
- The polysaccharide vaccine should normally not be given to children below 2 years of age however, if found necessary, those between three months and two years of age must be given two doses of polysaccharide vaccine with a three month interval between the two doses.

In case of a documented outbreak at the Haj site, all the Hajjis returning to the country should receive chemoprophylaxis irrespective of their vaccination status.

### CAN ONE PREDICT AN EPIDEMIC?

Nasopharyngeal carrier studies in healthy population have not been found to predict an epidemic. However some of the early warning signals are:

- An attack rate of at least 5 fold higher than that observed during previous years in the same area, or if data for the same are not available, an attack rate of at least 5 fold higher than rates in the similar areas of the country.
- An attack rate of probable and confirmed meningococcal disease surpassing 5 cases per one lac population (while working out the attack rate, the preceding three months could be considered. Attack rate should be applied to the populations of a district, estimation of attack rates in an entire country will usually fail to detect local/focal epidemics).
- Rising incidence of the disease (probable or confirmed) for three consecutive weeks in the same area also calls for immediate attention.
- Occurrence of even a single case in epidemiological settings such as nursery, hostels, military barracks and jails needs immediate attention.

### CONTROL OF EPIDEMICS

#### Management of patients

- Provision for prompt and proper management of patients to prevent morbidity and mortality is of utmost importance. The hospitals should be well stocked with the required medicines as per the recommended guidelines for management of the patients.
- Augmentation of surveillance should be done so that cases could be detected early.
- Epidemiological investigation to identify various factors involved in outbreak should be instituted.

#### Immunoprophylaxis

It has been documented that a mass vaccination campaign, if appropriately carried out, is able to halt the epidemic of meningococcal diseases due to serogroups A&C within weeks. However, such a decision depends on many other issues e.g. geographical distribution of cases, age specific attack rates and the resources

available. If the number of cases is below the epidemic threshold, mass vaccination is not recommended. Mass vaccination of population may be considered only when attack rate of disease exceeds **10 cases per lac population** in a given area, considering the geographic distribution of cases and the age specific attack rate and availability of the vaccine. During epidemics, vaccination can also be given to Health Care workers, laboratory workers and other close contacts of the cases.

For the first time in the country, mass vaccination of the entire population (2-50 year age group) of two of the worst affected districts of Meghalaya by meningococcal disease outbreak, namely, East Khasi hills and Jaintia hills districts has been carried out using Bivalent(A+C) meningococcal polysaccharide vaccine during May 2009. Mass vaccination of the entire population (2-45 year age group) of the two worst affected blocks of dhalai district of Tripura (Chawmanu and Manu Blocks) is also being carried out using a similar vaccine.

### Chemoprophylaxis

During an epidemic, a large number of people are already affected & therefore application of mass chemoprophylaxis will require large deployment of resources. The chemoprophylactic drugs being recommended are also not without side effects. In addition, from epidemiological point of view, reinfection of asymptomatic persons is also quite frequent and therefore, application of **mass chemoprophylaxis during an outbreak is not considered epidemiologically appropriate and cost effective.**

In a focal outbreak (small cluster), chemoprophylaxis to close contacts should be given, particularly so in boarding schools, hostels, institutions, jail-inmates etc. Chemoprophylaxis is also indicated in close contacts of sporadic cases.

### Use of media

The media can help to increase awareness among health workers and educate the community about early symptoms that may be related to disease in the outbreak. Local beliefs about the disease transmission should be explored and any misconceptions addressed. A close collaboration between the media and health authorities is necessary throughout an epidemic.

**Diagnostic and epidemiological support for any suspected meningococcal disease outbreak can be provided by NCDC, Delhi, if requested.**

### General measures

Although some uncertainty remains about the circumstances in which transmission of meningococci occurs, it has been suggested that transmission may be enhanced when people are together in crowded situations, which should be avoided.

### Prevention & Control of outbreak

- Early diagnosis and management.
- Chemoprophylaxis to close contacts in household and health care workers.
- Vaccination of high-risk group.
- Health education to allay fear and improve knowledge of signs and symptoms to seek early treatment.
- Inform neighbouring districts
- Respiratory isolation of all patients for 72 hours.

### ...about CD Alert

**CDAlert** is a monthly newsletter of the National Centre for Disease Control (NCDC) (formerly known as NICD), Directorate General of Health Services, to disseminate information on various aspects of communicable diseases to medical fraternity and health administrators. The newsletter may be reproduced, in part or whole, for educational purposes.

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