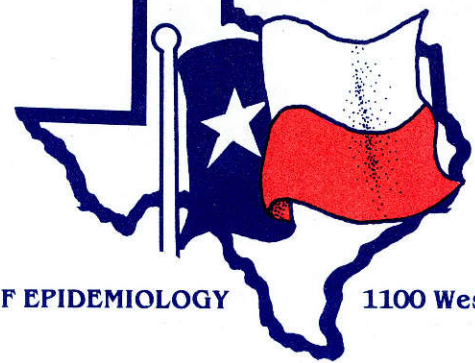


Texas Preventable Disease



NEWS

TEXAS STATE DOCUMENT COLLECTION

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Meningococcal Vaccines
Tuberculosis Control Division Notes

BUREAU OF EPIDEMIOLOGY

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MENINGOCOCCAL VACCINES

The following recommendations from the Immunization Practices Advisory Committee (ACIP) first appeared in the CDC publication, Morbidity and Mortality Weekly Report, Vol.34/No.18, May 10, 1985.

INTRODUCTION

A polysaccharide vaccine against disease caused by Neisseria meningitidis serogroups A, C, Y, and W-135 is currently licensed in the United States. This statement updates the previous statement (MMWR 1978;27:327-9), summarizes available information on the vaccine, and offers guidelines for its use in the civilian population of the United States.

MENINGOCOCCAL DISEASE

N. meningitidis causes both endemic and epidemic disease, principally meningitis and meningococemia. It is the second most common cause of bacterial meningitis in the United States (approximately 20% of all cases), affecting an estimated 3,000 to 4,000 people each year. The case-fatality rate is approximately 10% for meningococcal meningitis and 20% for meningococemia, despite therapy with antimicrobial agents, such as penicillin, to which all strains remain highly sensitive.

No major epidemic of meningococcal disease has occurred in the United States since 1946, although localized community outbreaks have been reported. The incidence of endemic meningococcal disease peaks in the late winter to early spring. Attack rates are highest among children aged 6 to 12 months and then steadily decline; by age 5 years, the incidence approximates that for adults. Serogroup B, for which a vaccine is not yet available, accounts for 50% to 55% of all cases; serogroup C, for 20% to 25%; and serogroup W-135, for 15%. Serogroups Y (10%) and A (1% to 2%) account for nearly all remaining cases. Serogroup W-135 has emerged as a major cause of disease only since 1975. While serogroup A causes only a small proportion of endemic disease in the United States, it is the most common cause of epidemics elsewhere. Less commonly, serogroups C and B can also cause epidemic disease.

People with certain chronic conditions appear to be at increased risk of developing meningococcal infection. Meningococcal disease is particularly common among individuals with component deficiencies in the final common complement pathway (C3, C5-C9), many of whom experience multiple episodes of infection. Asplenic persons seem also to be at increased risk of developing meningococcal disease and experience particularly severe infections. It is uncertain whether individuals with other diseases associated with immunosuppression are at higher risk of acquiring meningococcal disease, as they are for disease caused by other encapsulated bacteria. In the past, new military recruits were at especially high risk, particularly for serogroup C disease; however, since routine vaccination of recruits with the bivalent

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A/C vaccine began in 1971, disease caused by those serogroups has been uncommon. Military recruits currently receive the A, C, Y, W-135 vaccine.

MENINGOCOCCAL POLYSACCHARIDE VACCINES

The recently licensed quadrivalent A, C, Y, W-135 vaccine (Menomune®—A/C/Y/W-135, manufactured by Squibb-Connaught) is the formulation currently available in the United States. The vaccine consists of 50 µg each of the respective purified bacterial capsular polysaccharides.

Vaccine efficacy. Numerous studies have demonstrated the immunogenicity and clinical efficacy of the A and C vaccines. The serogroup A polysaccharide induces antibody in some children as young as 3 months of age, although a response comparable to that seen in adults is not achieved until 4 or 5 years of age; the serogroup C component does not induce a good antibody response before age 18 to 24 months. The serogroup A vaccine has been shown to have a clinical efficacy of 85% to 95% and to be of use in controlling epidemics. A similar level of clinical efficacy has been demonstrated for the serogroup C vaccine, both in American military recruits and in an epidemic. The group Y and W-135 polysaccharides have been shown to be safe and immunogenic in adults and in children over 2 years of age; clinical protection has not been demonstrated directly, but is assumed, based on the production of bactericidal antibody, which for group C has been correlated with clinical protection. The antibody responses to each of the four polysaccharides in the quadrivalent vaccine are serogroup-specific and independent.

Duration of efficacy. Antibodies against the group A and C polysaccharides decline markedly over the first three years following a single dose of vaccine. This antibody decline is more rapid in infants and young children than in adults. Similarly, while vaccine-induced clinical protection probably persists in schoolchildren and adults for at least three years, a recent study in Africa has demonstrated a marked decline in the efficacy of the group A vaccine in young children over time. In this study, efficacy declined from greater than 90% to less than 10% over three years in those under 4 years of age at the time of vaccination; in older children, efficacy was still 67% three years after vaccination.

RECOMMENDATIONS FOR VACCINE USE

Routine vaccination of civilians with meningococcal polysaccharide vaccine is not recommended for the following reasons: 1) the risk of infection in the United States is low; 2) a vaccine against serogroup B, the major cause of meningococcal disease in the United States, is not yet available; and 3) much of the meningococcal disease in the United States occurs among children too young to benefit from the vaccine. However, the vaccine has been shown to be of use in aborting outbreaks due to serogroups represented in the vaccine and should be used in their control. In an outbreak, the serogroup should be determined and the population at risk delineated by neighborhood, school, dormitory, or other reasonable boundary. Although endemic disease is very uncommon above age 5 years, older children, adolescents, and young adults constitute a higher proportion of cases during epidemics and may warrant vaccination during an outbreak.

Routine immunization with the quadrivalent vaccine is recommended for particular high-risk groups, including individuals with terminal complement component deficiencies and those with anatomic or functional asplenia. Persons splenectomized because of trauma or nonlymphoid tumors and those with inherited complement deficiencies have acceptable antibody responses to meningococcal vaccine, although clinical efficacy has not been documented. It should be recognized that such individuals frequently have preexisting antibody against N. meningitidis and may not be protected by vaccination.

Vaccination with the A-C vaccine may benefit some travelers to countries recognized as having hyperendemic or epidemic disease and Americans living in these areas, particularly those who will have prolonged contact with the local populace. One area of the world recognized as having recurrent epidemics of meningococcal disease is the part of sub-Saharan Africa known as the "meningitis belt," which extends from Mauritania in the west to Ethiopia in the east. Epidemics have been recognized in other parts of the world, and updated information can be obtained from travelers' clinics, state health departments, and CDC.

Primary Immunization. For both adults and children, vaccine is administered subcutaneously as a single 0.5-ml dose. The vaccine can be given at the same time as other immunizations, if needed. Good antibody levels are achieved within 10 to 14 days after vaccination.

PRECAUTIONS AND CONTRAINDICATIONS

Reactions. Adverse reactions to meningococcal vaccine are mild and infrequent, consisting principally of localized erythema lasting 1 to 2 days. Up to 2% of young children develop fever transiently after vaccination.

Pregnancy. On theoretical grounds, it is prudent not to immunize pregnant women unless there is a substantial risk of infection. However, evaluation of the vaccine in pregnant women during an epidemic in Brazil demonstrated no adverse effects. Further, antibody studies in these women showed good antibody levels in maternal and cord blood following vaccination during any trimester; antibody levels in the infants declined over the first few months and did not affect their subsequent response to immunization.

REVACCINATION

Revaccination may be indicated for individuals at high risk of infection, particularly children who were first immunized under 4 years of age; such children should be considered for revaccination after two or three years if they remain at high risk. The need for revaccination in older children and adults remains unknown.

PROSPECTS FOR FUTURE MENINGOCOCCAL VACCINES

Work is continuing on a serogroup B meningococcal vaccine, as well as on improved A and C vaccines. Candidate vaccines include capsular polysaccharides complexed with meningococcal outer-membrane proteins or covalently linked to carrier proteins. Clinical efficacy data for these vaccines are not available.

ANTIMICROBIAL CHEMOPROPHYLAXIS

Antimicrobial chemoprophylaxis of intimate contacts remains the chief preventive measure in sporadic cases of N. meningitidis disease in the United States. Intimate contacts include 1) household members, 2) day-care-center contacts, and 3) anyone directly exposed to the patient's oral secretions, such as through mouth-to-mouth resuscitation or kissing. The attack rate for household contacts is 0.3% to 1%, 300 to 1,000 times the rate in the general population.

Unless the causative organism is known to be sensitive to sulfadiazine, the drug of choice is rifampin, given twice daily for 2 days (600 mg every 12 hours to adults; 10 mg/kg every 12 hours to children 1 month of age or older; 5 mg/kg every 12 hours to children under 1 month of age). Rifampin has been shown to be 90% effective in eradicating nasopharyngeal carriage. No serious adverse effects have been noted. However, rifampin prophylaxis is not recommended for pregnant women, as the drug is teratogenic in laboratory animals. Also, as well as turning urine orange, rifampin

is excreted in tears, resulting in staining of contact lenses; thus, they should not be used during the course of therapy.

Because systemic antimicrobial therapy of meningococcal disease does not reliably eradicate nasopharyngeal carriage of N. meningitidis, it is also important to give chemoprophylaxis to the index patient before discharge from the hospital.

Nasopharyngeal cultures are not helpful in determining who warrants chemoprophylaxis and unnecessarily delay institution of this preventive measure.

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TUBERCULOSIS CONTROL DIVISION NOTES

Seromycin:

The Tuberculosis Control Division is currently having difficulty in purchasing Seromycin (cycloserine) capsules. Distribution controls have been established in an attempt to conserve present TDH stocks. If this problem continues, it may be necessary to restrict distribution to selected tuberculosis patients.

Tuberculin Skin Testing:

Any apparent irregularities in the results of tuberculin skin testing should be reported to Luis Escobedo, MD, Bureau of Communicable Disease Services, 458-7455 (STS 824-9455). Doctor Escobedo is available to assist in analyzing problems in skin testing.

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