AMERICAN ACADEMY OF PEDIATRICS

Committee on Native American Child Health and Committee on Infectious Diseases

Immunizations for Native American Children

ABBREVIATIONS. Hib, *Haemophilus influenzae* type b; AI/AN, American Indian/Alaska Native; IHS, Indian Health Service; ACIP, Advisory Committee on Immunization Practices; AAP, American Academy of Pediatrics; HBsAg, hepatitis B surface antigen.

Native American children are at greater risk for certain diseases and conditions such as hepatitis A, hepatitis B, and diseases caused by *Haemophilus influenzae* and *Streptococcus pneumoniae*. Recommendations for vaccine use in many Native American communities differ from those for the general population; vigorous vaccination practices have resulted in a lowering of the rates of morbidity and mortality from these preventable diseases in Native American communities. This policy statement provides immunization recommendations for children residing in Native American communities, and will discuss how to modify these recommendations for Native American children in particular situations.

HAEMOPHILUS INFLUENZAE TYPE B (Hib)

Before universal Hib immunization for infants was realized, invasive Hib disease occurred with increased frequency and at younger ages in American Indian/Alaska Native (AI/AN) children compared with the general US population. Annual case rates of Hib disease were as much as 10-fold greater in AI/AN children. In ANs, 25% of all Hib disease and 35% of Hib meningitis cases occurred before 6 months of age, compared with 15% of all Hib disease and 17% of Hib meningitis cases in non–ANs.[1–3] A younger age among children with invasive Hib disease also has been observed in other AIs/ANs, including Apache and Navajo children in Arizona, Utah, and New Mexico.[4,5]

Because of the risk of invasive Hib disease at younger ages, the Indian Health Service (IHS) has recommended a preference for the PRP-OMP (PEDVAX HIB) Hib conjugate vaccine based on seroconversion rates of 60% after the first dose of PRP-OMP, compared with rates of only 20% for other Hib conjugate vaccines.[6] Therefore, in regions in which Hib disease in young infants continues to occur, clinicians should consider using PRP-OMP for the first conjugate Hib dose (eg, at 2 months) in AI/AN children. However, initiation of Hib immunization should not be delayed if PRP-OMP is not available. The new combined PRP-OMP/hepatitis B (COMVAX) vaccine may be used to reduce the number of individual injections. This vaccine may be used for the first scheduled conjugate Hib dose and any subsequent dose that is scheduled for these two vaccines. In the event that PRP-OMP or PRP-OMP/hepatitis B vaccines are not available, any conjugate Hib can be used for subsequent doses, because it has been shown that the use of a conjugate Hib other than PRP-OMP for subsequent doses is associated with comparable or even higher antibody levels after the second or third doses, compared with sequential use of PRP-OMP alone.[7] If more than one vaccine has been used for an individual child, four doses will be required.

HEPATITIS A

Large outbreaks of hepatitis A occurring every 5 to 12 years have been documented in AI/AN communities throughout the United States, including the IHS Areas of Aberdeen (South Dakota, North Dakota, Nebraska, and Iowa), Alaska, and Navajo (parts of Arizona, New Mexico, and Utah).[8] The annual incidence of hepatitis A in AI communities in South Dakota exceeded the South Dakota non–AI incidence rates by 33-fold during the period of 1990 to 1994 (92.6 vs 2.8 cases per 100 000 per year, respectively).[8] During a 1992 outbreak of hepatitis A in AN communities, the annual incidence was 322 cases per 100 000 in the population, compared with an incidence of 9.0 per 100 000 in the general US population.[9] The seroprevalence of antibodies to hepatitis A in the AN population has been shown to increase from 7% in children to 85% in older adults.[10] Similarly, among certain AI populations, the seroprevalence of antibodies to hepatitis A is 30% to 40% among children younger than 5 years of age, increasing to 90% to 100% among persons older than 20 years of age.[11]

Routine hepatitis A vaccination of 2-year-old children in AI/AN communities has been recommended by the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention and the American Academy of Pediatrics (AAP).[12,13] In addition, children between 2 and 18 years of age who have not been immunized previously should be immunized within the next 5 years. This "catch-up immunization" can be achieved by vaccination of selected cohorts (eg, children 2 to 3 years of age and/or those entering early childhood programs or school) each year for 5 years. In communities experiencing new or continuing outbreaks of hepatitis A, accelerated vaccination of older children should be instituted. Consideration should be given to immunizing urban AI/AN children older

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than 24 months because they are likely to be exposed to children from AI/AN communities at high risk of hepatitis A (eg, by being exposed to those living on reservations or in areas with known epidemic or high endemic rates of hepatitis A).

HEPATITIS B

Before routine hepatitis B immunization, ANs experienced high attack rates of acute hepatitis B (250 cases per 100 000 per year); the seroprevalence of hepatitis B virus (HBV) infection (hepatitis B surface antigen [HBsAg]) among ANs was 3.1% with an overall (13.8%) prevalence of infection.[14] In this population, the rate of perinatal HBV infection is low and the majority of chronic infections occur by person-to-person (horizontal) transmission during the first 5 years of life, including during infancy.[15,16] Since the institution of universal hepatitis B vaccination for infants and children in Alaska in 1983, the rate of hepatitis B has decreased by >98%, to <5.0 cases per 100 000 per year.[16] In other Native American populations the prevalence of chronic HBV infection is similar to that found in the general US population. However, the incidence of acute hepatitis B disease is high with most infections occurring among young adults with known risk factors.[17]

Continued universal infant immunization is recommended, as is continuing immunization of all Native American children and adults who remain susceptible. In addition, universal serologic screening for HBsAg among pregnant women is recommended. Infants born to mothers who are HBsAg-positive or to mothers with acute hepatitis B should receive postexposure prophylaxis with hepatitis B immunoglobulin and hepatitis B vaccine according to the recommendations of the Academy.[13]

The Academy issued an interim report on July 14, 1999 regarding the use of thimerosal-containing vaccines (www.aap.org). Academy recommendations for prevention of hepatitis B in infants born to HBsAg-positive mothers and infants born to women not tested for HBsAg during pregnancy remain unchanged from the 1999 Recommended Childhood Immunization Schedule. If thimerosal-free vaccine is not available, the AAP has recommended initiation of hepatitis B vaccination at 6 months of age for infants born to HBsAg-negative mothers. At this time the only thimerosal-free hepatitis B vaccine available (COMVAX, Merck) also contains Hib vaccine (PRP-OMP) and may be given at the 2-month visit. This product is not approved for use before 6 weeks of age because of decreased response to the Hib component. Additional thimerosal-free hepatitis B vaccines are anticipated within the next few months, perhaps by the time this statement is published. When supplies become available, it will be appropriate to resume the previous recommendation that immunization may begin in the newborn period. The Centers for Disease Control and Prevention has subsequently recommended infants should receive hepatitis B vaccine at birth if they are born to HBsAg-negative mothers belonging to populations or groups that have a high risk of early childhood HBV infection, including Asian Pacific Islanders, immigrant populations from countries in which HBV is of high or intermediate endemicity (see Health Information for International Travel, 1999), and households with persons with chronic HBV infection (HBsAg-positive persons) (http://www.cdc.gov/nip/news/thimerosal.htm). Alaska children are at increased risk of early childhood hepatitis B virus transmission and chronic infection. Therefore, the state of Alaska has recommended continuation of the policy for immunization beginning at birth including infants born to HBsAg-negative mothers (personal communication, Laurel Wood).

If infants do receive thimerosal-containing vaccine at birth, efforts should be made to provide them with thimerosal-free vaccines of all types for subsequent immunizations to minimize exposure to thimerosal during infancy.

STREPTOCOCCUS PNEUMONIAE

The incidence of invasive pneumococcal disease in certain AN and Apache Indian populations is 5 to 24 times higher than the rate in the general US population (Table 1).[18] The highest incidence rates are in children younger than 2 years of age, the period during which the only Food and Drug Administration-approved polysaccharide pneumococcal vaccine is neither effective nor approved for use. The incidence of invasive pneumococcal disease in AN children younger than 2 years old is fivefold greater than that in the general Alaskan population or other US populations. In certain populations, such as those in southwest Alaska, the incidence of invasive pneumococcal disease in AN children younger than 2 years of age (1587 cases per 100 000 per year) is 20 times that of the rate in the general US population.[19] Pneumococcal disease incidence is even higher in Apache children younger than 2 years of age in Arizona (1820 cases per 100 000 per year).[20]

The incidence of pneumococcal infections decreases dramatically after the second birthday in all populations. In Apache children the incidence is 227 cases per 100 000 per year in children 2 to 4 years old and 54 per 100 000 in children 5 to 9 years old.[20] In AN children at similar age ranges, the incidence rates are 98 and 23 per 100 000 population, respectively, approximately three- to fourfold greater than in the

TABLE 1. Comparison of the Incidence of the Invasive Pneumococcal Disease in White Mountain Apaches and ANs and the Incidence in Representative Non-Native American Populations

Population	Incidence per 100 000 per year			
	All Ages	0–24 Months	2–4 Years	5–9 Years
Native Americans/Alaskans				
White Mountain Apache	207	1820	227	54
Alaska (Yukon-Kuskokwim)	105	1195	—	—
Alaska	77	624	98	23
Non-Native American populations				
Alaska	16	130	30	6
Hawaii	9.8	103	—	—
Charleston, South Carolina	8.5	35	—	—
Southern California[19]	13	145	25	5*

* Incidence in children 5 to 14 years of age.

general Alaskan population. The incidence of pneumococcal infection in other AI/AN groups needs to be defined.

The ACIP has recommended that the current 23-valent polysaccharide pneumococcal vaccine be given to those children living "in environments or social settings in which the risk for pneumococcal disease or its complications is increased (eg, Alaska Natives and certain American Indian populations)."[21] A single dose of pneumococcal 23-valent polysaccharide vaccine should be considered for children between 2 and 4 years of age in those Native American populations in which an increased risk of invasive pneumococcal disease has been demonstrated. A second dose is not recommended for children unless they fall into a risk group for which a second dose of vaccine is considered to be indicated (eg, those with splenectomy). Population–based data on the efficacy of the pneumococcal polysaccharide vaccine in the prevention of invasive disease in AI/AN children are not available. Pneumococcal polysaccharide/protein conjugate vaccines have been investigated in AI populations and have been found to stimulate antibody production in young infants. This vaccine will be available soon, and should be used according to recommendations of the ACIP and the AAP Committee on Infectious Diseases that will be made available after licensure of the vaccine.

RECOMMENDATIONS

Incorporation of the following recommendations will maximize the demonstrated or potential protective efficacy of vaccines currently available for AI/AN children.

1. PRP-OMP *Haemophilus* conjugate vaccine is the preferred initial immunizing dose for prevention of *Haemophilus* infections. PRP-OMP or any other conjugate Hib may be used for subsequent doses of conjugate Hib.
2. Hepatitis A vaccine should be a routine immunization for all AI/AN children at the earliest recommended age (currently 2 years). Hepatitis A vaccine should be administered to AI/AN children between 2 and 18 years of age who are frequently exposed to those living in areas with endemic or epidemic hepatitis A.
3. All infants and children should be immunized with hepatitis B vaccine. The age for initiating vaccination is dependent on the mother's HBsAg status, the local epidemiology of hepatitis B infections, and the availability of thimerosal-free vaccines (see text above for details). If infants do receive thimerosal-containing vaccine at birth, efforts should be made to provide them with thimerosal-free vaccines of all types for subsequent immunizations to minimize exposure to thimerosal during infancy.
4. A single dose of pneumococcal 23-valent polysaccharide vaccine should be considered for Native American children at 2 years of age residing in areas where an increased risk of invasive pneumococcal disease has been demonstrated after 2 years of age. In these selected areas, the greatest risk is between 2 to 4 years of age, and routine vaccination of older children is not indicated.
5. Combined *Haemophilus* PRP-OMP conjugate vaccine/hepatitis B vaccine may be used at visits scheduled for either the *Haemophilus* conjugate vaccine or hepatitis B vaccine dose for infants 6 weeks of age or older to reduce the number of injections.

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