Asian Strategic Alliance for Pneumococcal disease prevention

Recommendations for Pneumococcus Vaccination in Children

By Asian Society for Pediatric Infections Diseases, Asian Strategic Alliance for Pneumococcal Disease Prevention, Taiwan Immunization Vision and Strategy

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Introduction

Streptococcus pneumoniae infection is a serious global problem with a high mortality rate. The World Health Organization (WHO) estimates that 1.6 million die every year from the infection, with about half of them occurring in children aged <5 years [1]. Most of the deaths occur in developing countries, especially those in Asia and Africa where there are only limited surveillance date of invasive pneumococcal disease [2,3].

There are two types of pneumococcal vaccine. The 23-valent pneumococcal polysaccharide vaccine (PPV23) contains 23 capsular polysaccharide antigens of S. pneumoniae: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, and 33F. PPV23 can be use in children aged ≥2 years and in adults.

Three pneumococcal polysaccharide-protein conjugate vaccine (PCV) are currently available in the market, including 7-valent PCV (PCV7; Prevenar, Wyeth, Philadelphia, USA), 10-valent PCV (PCV10; Synflorix, GlaxoSmithKline Biologicals, Rixensart, Belgium), and 13-valent PCV (PCV13; Prevenar13, Wyeth, Philadelphia, USA). PCV7 and PCV13 are formulated and manufactured using the same processes. Each polysaccharide capsular antigen is conjugated to a nontoxic diphtheria cross-reactive material (CRM) carrier protein (CRM197). Most capsular antigens in PCV10 are conjugated to protein D, a common surface antigen of nontypable Haemophilus influenzae.

PCV7 contains seven serotypes: 4, 6B, 9V, 14, 18C, 19F, and 23F. PCV10 contains 3 additional serotypes (1, 5, and 7F) and PCV13 contains 3 more additional serotypes (3, 6A, and 19A). Clinical studies showed that these pneumococcal vaccines are safe and are effective in preventing pneumococcal infections, including invasive pneumococcal disease (IPD), pneumococcal pneumonia, and pneumococcus-associated otitis media [4].

Recommendations

1. There is a substantial burden of IPD, in the Asia Pacific region. High incidence of IPD is observed in children aged <5 years. The mortality rate of children with IPD is very high in developing countries.
2. Using PCV to prevent pneumococcal disease in young children is cost-effective in Asia Pacific countries. Routine use of pneumococcal vaccine in young children and children with high risk is strongly recommended.
3. With the emergence of penicillin-nonsusceptible S. pneumoniae and beta-lactamase-negative ampicillin-resistant H. influenzae, preventing these bacteria infection by vaccination is becoming a more and more important strategy to maintain the child health.
4. PCV should be given to all children aged 2- 59 months. A single dose of PCV13 may be administered for high-risk children aged 6 - 18 years who have not received PCV13 previously (Table). Children aged ≥2 years with high risk may receive PPV23 after completing recommended doses of PCV's. The interval between PCV and PPV23 is at least 8 weeks. A booster dose of PPV23 may be given more than 5 years after the first dose of PPV23 in children with immunocompromised conditions listed in the Table.
5. All PCV's are effective and safe, and the committee does not express a preference for any of the vaccines.
6. Continued surveillance is warranted to identify further evolution of the epidemiology, clinical syndromes, antibiotic susceptibility, and serotype distribution of S. pneumoniae in the Asia Pacific region.

Table. High-risk conditions of invasive pneumococcal disease in children

Immunocompetent conditions	Chronic heart disease with cyanosis or heart failure
	Chronic lung disease, including asthma treated with high-dose oral corticosteroid
	Debilitating neuromuscular disorders
	Diabetes mellitus Thalassemia major and other clinically significant chronic hemolytic anemia
	Cerebrospinal fluid leaks
	Cochlear implant
Immunocompromised conditions	Functional or anatomic asplenia
	Human immunodeficiency virus infection
	Chronic renal failure and nephrotic syndrome
	Immunosuppressive therapy
	Radiation therapy
	Congenital immunodeficiency

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