Invasive pneumococcal disease in European children: immunization with a new conjugate vaccine provides a timely solution*

Infection by the bacterial pathogen *Streptococcus pneumoniae* can lead to meningitis, bacteraemia, pneumonia, or otitis media, which leads to considerable morbidity in infants less than 2 years of age. Furthermore, invasive pneumococcal disease (IPD) may cause death, and meningitis can lead to severe neurological sequelae – including deafness, seizures, neuromotor disabilities, and mental retardation. Even if there is significant under-reporting, the incidence among European children ranges from 10 to 45 cases of IPD / 100,000 / year, with a peak at 6 to 24 months of age. *Streptococcus pneumoniae* is the primary source of bacterial meningitis for children less than 2 years of age in many countries.

Most children develop IPD in the absence of one of the commonly recognized predisposing conditions, such as sickle cell disease, asplenia, HIV/AIDS, immune deficiency disease, certain chronic diseases, CSF leaks, cochlear implants, or immunosuppressive therapy. Published studies suggest that merely 10 to 27 percent of children with IPD had a predisposing underlying condition, with the greater proportion among older children. At the population level, important elements associated with a greater risk ratio for IPD are a preceding viral respiratory infection, day care attendance, or lack of breast feeding, while among older children these elements are poverty, crowding, passive smoking, or a history of severe / chronic otitis media.

The pneumococcal polysaccharide (23vPnPS) vaccines are poorly effective in children below 24 months of age. On the contrary, the pneumococcal conjugate (PnC) vaccines are safe, immunogenic, and efficacious in this age group. The serotype coverage of the 7-valent PnC vaccine, Prevenar, remains between 70 and 80 percent for IPD in young children in Europe – and this coverage is even more noteworthy for the antibiotic resistant serotypes. There is an increasing prevalence throughout Europe of antibiotic resistance among the pneumococcal serotypes most responsible for IPD. Subtle issues of self-treatment and compliance, compounded by widespread reliance on day care, drive this surge in antibiotic-resistant *S. pneumoniae*. Nevertheless, the pneumococcal conjugate vaccines are able to reduce the nasopharyngeal carriage of the *S. pneumoniae* serotypes that are included in the vaccine and, hence, reduce the carriage of antibiotic-resistant serotypes.

Clinical trials and post-marketing experience have demonstrated the protective efficacy of the pneumococcal conjugate vaccine, Prevenar. A 90 percent reduction in the incidence of IPD has occurred among populations of immunized children, in the absence thus far of a replacement by any non-vaccine serotypes that might cause IPD. Moreover, there is now evidence of herd immunity since the incidence of IPD has fallen both in adult populations and among the non-vaccinated infants.

Prevenar has been demonstrated to be safe, immunogenic, and effective. Considering the important effect on the incidence of IPD, there should be no more excuses to delay introducing this vaccine into the countries of Europe. Universal vaccination appears to be the most appropriate policy to assure protection of children.


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