Why BC is moving from four to three doses of conjugate pneumococcal vaccine for infant immunization

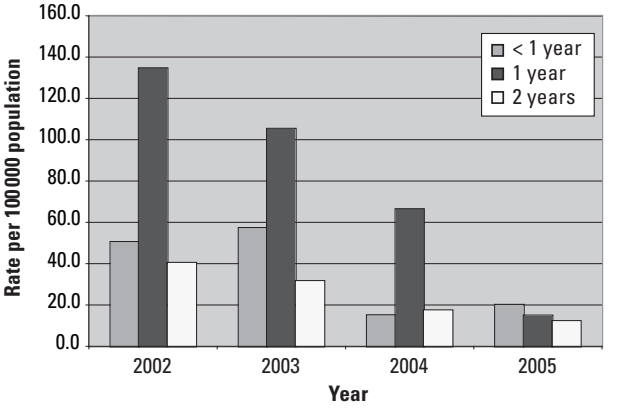

Figure. Incidence of invasive pneumococcal disease in children less than 3 years old.

Universal immunization of BC infants with four doses of conjugate pneumococcal vaccine was introduced in September 2003. There is already a dramatic decline in the rate of invasive pneumococcal disease in those under the age of 5.[1] (Figure).

The immune response to conjugate vaccine is proving sufficiently robust—post-marketing studies now provide evidence that three doses will prove as immunogenic as four in healthy infants. On the basis of this evidence, BC's Communicable Disease Policy Committee has advised that BC follow Quebec, Australia, and the United Kingdom and provide a three-dose schedule of conjugated pneumococcal vaccine beginning January 2007. The new schedule will include immunization at ages 2, 4, and 12 months. This is a change from the current schedule of 2, 4, 6, and 18 months.

All immunizing physicians and nurses should understand the rationale for this change.

Immunogenicity

Studies that examined use of two doses of conjugate pneumococcal vaccine in early infancy followed by a further dose closer to age 1 year (a total of three doses) indicated excellent induction of memory response as ascertained by high levels of antibodies. One of these studies made direct comparison with a four-dose series and found no disadvantage in immunogenicity for the three-dose series.[2-4]

Effectiveness

The Northern California Kaiser Permanente trials[5] determined the following outcomes:

- Efficacy of the vaccine was 97.4% for invasive disease caused by a vaccine serotype, for fully vaccinated (four doses) children.
- Effectiveness (intention to treat analysis) included all children who received at least one dose of the vaccine. Effectiveness was not significantly different from efficacy and was 93.9% (95% CI 79.6 to 98.5).

The US initiated a pneumococcal conjugate vaccine program in 2001. Vaccine shortages offered an opportunity for the Centers for Disease Control to conduct a case control study comparing the effectiveness of a three-dose series with a four-dose series.[6] Preliminary results indicated that three doses of vaccine provided protection equivalent to four doses.

Simulation model

A simulation model in Quebec shows a reduction in morbidity of 77.8% for the 2-, 4-, and 12-month schedule, and 78.1% for the four-dose (2, 4, 6, and 18 months) schedule.[7] The model also outlined the waste of continuing a four-dose rather than a three-dose schedule. Typically, in Canada there is support for health interventions that cost $25 000 to $50 000 per quality-adjusted life-year saved. A decision to retain four doses over three would at best cost $7.83 million per case prevented and $2 million per quality-adjusted life-year saved.

Acceptability

Parents and practitioners generally will welcome reduction in doses. The National Advisory Committee on Immunization statement on conjugate pneumococcal immunization permits a reduced dose schedule.[8]

Due diligence

Invasive pneumococcal disease (IPD) is reportable by physicians and laboratories in BC. Surveillance will continue along with extra efforts to ensure that all available isolates from IPD cases are serotyped so that it can be determined if there is any increase in the rate of cases caused by vaccine-preventable strains among immunized children. A four-dose recommendation will be retained for children at higher risk for IPD (First Nations children and those with predisposing medical illness).

The future

The current vaccine schedules are complex. This may be the first of several possible simplifications. The BC Communicable Disease Policy Committee is also examining the possibility of using hexavalent preparations to

reduce the need for separate pentavalent and hepatitis B shots. A combined measles, mumps, rubella, and varicella vaccine will soon be available for evaluation and consideration. There will be ongoing efforts to ensure that we are as efficient as possible in providing protection from vaccine-preventable disease.

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References

1. Paulus S, David ST, Tang W, et al. Incidence of invasive pneumococcal disease after introduction of the Universal Infant Immunization Program, British Columbia (2002-2005) CCDR 2006;32:14.
2. Esposito S, Pugni L, et al. Immunogenicity, safety, and tolerability of heptavalent pneumococcal conjugate vaccine administered at 3, 5, and 11 months post-natally to pre- and full-term infants. Vaccine 2005;23:1703-1708.
3. Goldblatt D, Suthern J, Ashton L, et al. Immunogenicity and boosting following a reduced number of doses of a pneumococcal conjugate vaccine in infants and toddlers. Fourth International Symposium on Pneumococci and Pneumococcal Diseases, Helsinki, Finland, April 2006;25:312-319.
4. Kayhty H, Ahman H, Eriksson K, et al. Pneumococcal conjugate vaccine (PNC-CRM) is immunogenic when administered at 3, 5, and 11 months of age. Pediatr Infect Dis J 2005;24:108-114.
5. Black S, Shinefield H, Fireman B, et al. Efficacy, safety, and immunogenicity of heptavalent pneumococcal conjugate vaccine in children. Pediatr Infect Dis J 2000;19:187-195.
6. CDC. Notice to readers: Limited supply of pneumococcal conjugate vaccine: Suspension of recommendation for fourth dose. MMWR 2004;53:108-109.
7. DeWals P, Erickson LJ, Farand L, et al. Assessment of the appropriateness of an immunization program for pneumococcal infections in children using a reduced number of doses of conjugate vaccine. January 2005. www.inspq.qc.ca (accessed 27 October 2006).
8. National Advisory Committee on Immunization. Update on the recommendations for the routine use of pneumococcal conjugate vaccine for infants. Canada Communicable Diseases Report 2006;32(ACS-4). www.phac-aspc.gc.ca/publicat/ccdr-rmtc/06vol32/acs-04/index.html (accessed 27 October 2006).

personal view

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Alberta pharmacists granted prescribing powers

Starting next year, Alberta pharmacists will be able to prescribe and initiate treatment for a variety of health concerns. In a statement by the Alberta College of Pharmacists available at http://pharmcists.ab.ca/newlegislation/faq.aspx, members will be able to "assess and triage each patient as required," start "prescribing drugs to treat minor, self-diagnosed or self-limiting disease conditions…" and may even take "…full responsibility for establishing and maintaining a patient's chronic drug therapy."

Perhaps the most striking development is the positioning of pharmacists as primary care providers. Couched in terms of patient choice, "initial access prescribing" is described as "prescribing when a patient chooses you for advice about and treatment of minor, self-limiting or self-diagnosed conditions, about wellness programs, or in urgent or emergency situations."

All of the above raises some very serious concerns. Knowing what a drug can do is one thing, making a diagnosis or knowing that a condition is minor is quite another, and the statement by the Alberta College that "Of all the health professionals in the system, pharmacists have the most education and training in the appropriate and safe use of medication" will make many doctors wonder why they wasted all that time in medical school actually looking after patients.

Will such lofty goals and clinical expertise come for free? It seems hard to imagine that the new breed of "prescribing pharmacists" will not seek further compensation. While the Alberta College states "money is not the issue here," this could be yet another example of governments rewarding minimally trained "clinicians" with near-FP salaries for small jobs typically done for free by doctors.

The ideas of patient convenience, easy access, and quality of service have great merit. Given the excellence of computer drug and interaction databases to allay the old concerns of prescriber error and to monitor chronic therapy, a more efficient approach, (since conflict of interest now seems to be of little concern) would be to allow physicians to dispense.

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