

Pneumococcal conjugate vaccine for HIV-infected adults

British Columbia is expanding use of pneumococcal conjugate 13-valent vaccine (PCV13, Prevnar 13) to HIV-infected adults starting in April 2015. Since June 2010, the vaccine has been in use for routine immunization of infants and healthy children under age 5, replacing the pneumococcal conjugate 7-valent vaccine (PCV7). In 2013 the National Advisory Committee on Immunization (NACI) issued an updated statement on use of pneumococcal conjugate vaccine in high-risk adults.¹ In addition to haematopoietic stem cell transplant recipients (HSCT, covered in the BC program), the only other individuals for whom the committee assessed the evidence as “good” are those with HIV infection. One dose of PCV13 followed by one dose of pneumococcal polysaccharide 23-valent vaccine (PPV23) at least 8 weeks later is recommended. For those who have received PPV23 in the prior year, NACI recommends waiting 1 year to give the dose of PCV13. A total of two lifetime doses of PPV23 is recommended, with the second dose given 5 years after the first dose of PPV23. PPV23 continues to be recommended in HIV-infected adults because about 38% of reported cases of invasive pneumococcal disease among adults in British Columbia are due to serotypes covered only by PPV23; 25% are due to serotypes not contained in either PCV13 or PPV23 (source: BCCDC data on file).

Detailed recommendations for the use of these vaccines are contained in the BC immunization manual available at www.bccdc.ca/dis-cond/comm-manual/CDManualChap2.htm.

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There has been longstanding interest in improved protection against pneumococcal disease, which remains an important infection across the age span. Reported rates of invasive pneumococcal disease in BC are about 8 per 100 000, but in infants and adults 60 and older the rates in 2013

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were 18.5 and 20 per 100 000, respectively.² The US Centers for Disease Control estimates that the rate among HSCT recipients is 186 and among HIV-positive people is 173 per 100 000.³ A record linkage study in southern Alberta identified a rate of invasive pneumococcal disease of 342 per 100 000 person-years among HIV-positive individuals, which was reduced to 187 per 100 000 within 3 years of PPV23 immunization. Although 75% of cases had received PPV23, 74% of invasive pneumococcal disease episodes were due to PPV23 serotypes.⁴ While the polysaccharide 23-valent vaccines provide a better spectrum of serotype coverage, these produce a T-cell independent immune response, which does not result in immunologic memory; as well, the resultant antibodies have lower avidity than those generated by protein-polysaccharide conjugate vaccines.⁵ Conjugate vaccines were developed to produce effective protection in young children and have been associated with reduction in nasopharyngeal carriage and herd immunity. Conjugate vaccines are also not associated with hyporesponsiveness or blunting of the immune re-

sponse with subsequent doses, which has been observed in studies of polysaccharide vaccines (meningococcal, Hib, and pneumococcal) including one study among HIV-infected adults in Uganda, which was terminated early because of concern about higher rates of invasive pneumococcal disease among prior PPV23 recipients.⁶ While this phenomenon is not well understood and may vary by pneumococcal serotypes and the unique immunogenetic profile of the host, these concerns are overcome by priming with conjugate vaccines.

There are no efficacy or effectiveness studies of PCV13 in HIV-infected adults, and recommendations are based on a study of PCV7 efficacy in HIV-infected adolescents and adults in Malawi with a prior episode of invasive pneumococcal disease in whom clinical protection against invasive pneumococcal disease of 75% (95% CI, 29%-92%) was observed,⁷ and several studies in Europe and the US of immunogenicity and safety of PCV7. In one such study, the prime-boost strategy of PCV7 followed by PPV23 was seen to result in a higher proportion of recipients achieving a twofold or greater rise in serotype specific IgG and antibody levels greater than or equal to 1 µg/mL compared to PPV23 vaccine alone; this phenomenon was also seen in smokers and those with hepatitis C infection, in whom the immune response was blunted in both groups but higher in the prime-boost group compared with those receiving only polysaccharide vaccine.⁸ The duration of protection of this series is still unknown.

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References

Available at bcmj.org.