

Possible Waning Protection of Acellular Pertussis Vaccine

In the past year, the pertussis outbreak has impacted many Vermont children, families and primary health care providers. Prevention of future pertussis outbreaks will be best achieved by developing new pertussis-containing vaccines that provide long-lasting immunity. This assertion made by Klein et al. comes from a study (N Engl J Med. 2012 Sep 13; 367(11):1012-9) in which the authors described waning protection of the acellular pertussis (aP) vaccine. In the study, the risk of pertussis increased by 42% for each year after the 5th dose of the combined diphtheria, tetanus, and acellular pertussis vaccine (DTaP). The study, conducted in California between 2006 and 2011, included a large pertussis outbreak in 2010. The incidence of pertussis during that outbreak was the highest since 1958, with a particular burden on 10 and 11 year olds. Incidence in 10 and 11 year olds was nearly twice as high as any other age group.

The epidemiology of the pertussis outbreak in Vermont shows some similarity to the California outbreak, particularly in the age group most affected. Since the start of 2012, nearly one-third of the 412 confirmed pertussis cases have occurred in 10-14 year olds. Vaccine coverage in this group has been high. Of the confirmed cases in this group who reported having no more than 5 doses of pertussis-containing vaccine (i.e., those who did not receive a Tdap booster), over 80% reported having all 5 doses -- reflecting the possibility of waning immunity. Many other states, including WA, MN and CO are experiencing a similar disease burden in this age range, which further supports the potential change in the epidemiology of pertussis.

Despite these recent findings, pertussis vaccination continues to be the **most effective** way to prevent disease. CDC recommends vaccination for infants, children, preteens, teens and adults. A schedule of DTaP (and Tdap) vaccination can be found at: (<http://healthvermont.gov/hc/imm/documents/ChildhoodIZSchedule7-2012.pdf>). In addition to vaccination, disease transmission can be decreased by prompt detection, treatment, and advising patients with suspected pertussis to stay at home and avoid close contact with others until completing the 5th day of antibiotics, or after 3 weeks of cough.

During 2012, nearly every state has reported an increase in pertussis cases compared to the same time period in 2011. As these outbreaks continue to evolve, more information about the possibility of waning vaccine efficacy will become clearer. However, based on the findings in the California outbreak and the age-specific disease burden seen in Vermont and other states, new pertussis-containing vaccines with long-lasting immunity will be needed to help reduce the burden of pertussis infection. In addition, the possibility of more booster doses may need to be investigated. Meanwhile, as Dr. Klein said in a recent New York Times article, “although a better vaccine is needed, the current vaccine is safe and effective, and some protection is better than no protection.”

Weekly updates on pertussis surveillance are posted on the Vermont Department of Health (VDH) website. Included is an update of confirmed cases by county for the last 6 weeks.

<http://healthvermont.gov/prevent/pertussis/surveillance.aspx>

Information for health care providers, including the VDH algorithms for clinical evaluation and management of pertussis patients and patient contacts, can be found at:

http://healthvermont.gov/prevent/pertussis/documents/VermontPertussisAlgorithm_9_6_12.pdf

The *Infectious Disease Bulletin* can be viewed at: <http://healthvermont.gov/pubs/IDB/index.aspx>
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