Medical Xpress

Minor shift in vaccine schedule has potential to reduce infant illness, death

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A new study by researchers at Wake Forest University School of Medicine and Vanderbilt University suggests that protecting infants from a common, highly contagious and even deadly disease may be as easy as administering a routine vaccine two weeks earlier than it is typically given.

The shift has the potential to prevent at least 1,236 cases of pertussis, 898 hospitalizations and seven deaths attributable to pertussis each year in the United States, said Timothy R. Peters, M.D., co-lead author and an assistant professor of pediatrics at Brenner Children's Hospital, which is part of Wake Forest Baptist.

"Rates of pertussis, which can be life-threatening in young infants, are increasing," Peters said. "Pertussis vaccine has been highly effective in defending children against this disease, and we find that modest adjustments in the timing of vaccine administration may offer enhanced protection to very young infants who are especially susceptible to severe disease."

The study appears in the November issue of *Pediatrics*.

Pertussis, commonly known as "whooping cough" or "the 100-day cough," is a disease marked by severe coughing. Young infants are at the highest risk for pertussis-related complications, including pneumonia, seizures, brain swelling and even death. Among infants in the United States, the incidence of pertussis peaks at 1 month of age and

progressively decreases over the next year. Pneumonia is the most common complication and cause of infant pertussis-related deaths and, in 2003 13 children died from pertussis. Most deaths occur among unvaccinated children or infants too young to be vaccinated.

While there is no lifelong protection against whooping cough, immunization is the best preventative measure. Current recommendations suggest five doses of the diphtheria-tetanus-acellular pertussis (DTaP) vaccine at 2, 4 and 6 months of age, with booster doses at 15 to 18 months and 4 to 6 years. Current recommendations also allow for administration of the first dose as early as 6 weeks of age, with the second and third doses at 3.5 months and 5.5 months.

The 2004 National Immunization Survey estimated that only 88 percent of infants had received one dose of DTaP vaccine by 3 months of age, 76 percent of infants had received two doses of DTaP vaccine by 5 months of age, and a mere 66 percent of infants had received the first three vital doses of DTaP vaccine by 7 months of age.

In this study, researchers sought to estimate the potential benefit of accelerating first dose administration from 2 months to 6 weeks of age.

"While two weeks may seem negligible, this change would reduce the time that a 2-month-old infant is completely without pertussis vaccine protection by 25 percent," Peters said. "Because pertussis so greatly threatens very young infants, the benefit of earlier vaccination may result in a significant decrease in severe pertussis disease nationally, and may be an especially useful approach during outbreaks of pertussis."

Researchers reviewed existing data to estimate current rates of pertussis infections, hospitalizations and deaths according to age and infant population in the United States in 2004. The data led researchers to expect that acceleration of the second and third doses by two weeks

would prevent an additional 923 cases, 520 hospitalizations, and two deaths, according to the study.

Although administration of the first dose of the pertussis vaccine at 6 weeks of age is a change from the current routine practice of administration at 2 months, the minor dose acceleration falls within the current recommendations of the Advisory Committee on Immunization Practices and the American Academy of Pediatrics for the childhood vaccination schedule, and should have little impact on medical providers or on the number of outpatient physician visits for vaccines. All of the vaccines that are routinely given at a 2-month "well child" visit could be given at a replacement 6-week visit and still be in compliance with accepted vaccine schedule recommendations, the researchers report.

The researchers advise that the study's results are based on nationally reported data and additional studies would be necessary to evaluate the actual effects of this intervention. In estimating the impact of accelerating the vaccine schedule, they used conservative criteria to reduce the chance of overestimation but admit they may have underestimated the true benefit in the process.

"Vaccines have tremendous potential to reduce disease rates and, as new data become available, practices should continue to modify their vaccination practices to optimize the impact," the researchers write in their findings. "Changes in vaccination schedules involve virtually no cost and have the potential for great benefit. This relatively minor change in pediatric practice could reduce the burdens on families and society of pertussis and perhaps of other vaccine-preventable diseases."

Source: Wake Forest University Baptist Medical Center