

## Outbreak Shows Vaccine Value; Azithromycin Prophylaxis Fails

BY DOUG BRUNK  
San Diego Bureau

SAN FRANCISCO — An analysis of a pertussis outbreak at a day care center in Israel revealed that the efficacy of the acellular pertussis vaccine in children who were vaccinated was 93%. Dr. Ellen S. Bamberger reported during a poster session at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy sponsored by the American Society for Microbiology.

"When we look at the distribution of children who actually got pertussis, the pertussis vaccine actually protects, and the children who are unvaccinated in an outbreak setting are much more likely to be infected, and their clinical symptoms tend to be more severe," Dr. Bamberger of the B'nai Zion Medical Center in Haifa, Israel, said in an interview.

She and her associates investigated 31 children aged 3-5.5 years who were exposed to a child with pertussis at a day care center in Haifa. Parents of the children filled out questionnaires about symptoms and immunization status, and the researchers obtained nasopharyngeal swabs for *Bordetella pertussis* and polymerase chain reaction (PCR) testing that targeted the pertussis toxin.

They conducted follow-up exams at 21 days and obtained repeat samples in symptomatic children.

Of the 31 children, 6 (19%) tested positive for pertussis by PCR. Only 2

of the 27 children (7%) who had been vaccinated against the disease tested positive for pertussis, compared with each of the 4 children who had not received a vaccination (100%). Dr. Bamberger and her associates calculated the vaccine to be 93% efficacious.

Azithromycin chemoprophylaxis was recommended for all exposed children but only 15 of the 25 exposed children (56%) took azithromycin. The dose was 10 mg/kg on the first day followed by 5 mg/kg for 4 days.

At 21-day follow-up, 2 of the 6 children with laboratory-confirmed pertussis (33%) reported a mild residual cough and 5 of the 25 exposed children (20%) had developed an upper respiratory tract infection with cough. Three of these 5 children (60%) had completed azithromycin prophylaxis. There were no further cases of laboratory-diagnosed pertussis in any of the exposed children, regardless of whether chemoprophylaxis was taken or not.

"Chemoprophylaxis with azithromycin did not appear to afford any added benefit in thwarting the development of pertussis among recently vaccinated children exposed to a pertussis outbreak," the researchers wrote in their poster.

"Our findings confirm the high efficacy and importance of the acellular pertussis vaccine in day care children, and despite the limited number of subjects in the study, raise questions about the added value of chemoprophylaxis in this age group." ■

## Local Factors Determine Pertussis Booster Efficacy

BY DOUG BRUNK  
San Diego Bureau

SAN FRANCISCO — Preliminary results from a European study suggest that the appropriate time for pertussis booster administration after school age may differ according to local factors such as circulation of the disease, the type of vaccine, and the vaccine schedule in use. Dr. Alberto Tozzi reported during a poster session at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy sponsored by the American Society for Microbiology.

"Now that the United States has recommended a booster dose in adolescents, every country in Europe will try to follow the same recommendation," Dr. Tozzi of Bambino Gesù Hospital in Rome said in an interview. "This, to me, is not appropriate, because there are different patterns and scenarios that need to be accurately investigated."



He and his associates used the pertussis screening method in 16 European countries and World Health Organization data to calculate vaccine efficacy by age and vaccination cohort between 1998 and 2002. The countries included in the study were Austria, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Malta, Norway, Portugal, Spain, Sweden, Switzerland, the Netherlands, and the United Kingdom.

The researchers found that the pertussis

vaccine efficacy exceeded 80% in each of the countries except Sweden and Norway. The immunization schedules in those Scandinavian countries, he said, do not include administration of a booster dose at school age. As a result, "they experience a big increase of cases after that age, because immunity induced by the immunization does not last that long," Dr. Tozzi said.

On the other hand, in Italy and France, where the vaccination schedule includes a booster dose at school age, the efficacy against pertussis was sustained until adolescence.

The type of vaccine matters, too. In the Netherlands, for example, clinicians currently use the cellular form of the pertussis vaccine. As a result, Dr. Tozzi noted, efficacy is maintained only for a few years. "Looking at all this data, you must take into account the background coverage for pertussis, the type of vaccine used, and the schedule," he

said. "All of these things must be looked at before deciding which kind of booster dose is to be given" and when.

He and his associates are collecting more data from these 16 countries in an effort to correctly plan the appropriate time to administer a booster dose of vaccine. The study is part of the Euvac.net project, an ongoing effort to monitor and control vaccine-preventable diseases in Europe, funded by the European Parliament and Council. ■

**'You must take into account the background coverage for pertussis, the type of vaccine used, and the schedule.'**

DR. TOZZI

## Minority Infants at Higher Risk for Pertussis From Adults, Teens

BY DIANA MAHONEY  
New England Bureau

TORONTO — Adults and teens with waning immunity to pertussis are putting infants—particularly minority infants—as well as themselves at unnecessary risk for developing the bacterial disease, Dr. Irini Daskalaki said at the annual meeting of the Infectious Diseases Society of America.

In one of three studies designed to track and assess the incidence of pertussis in a metropolitan area, Dr. Daskalaki and colleagues at St. Christopher's Hospital for Children in Philadelphia determined that nearly half of more than 400 cases of pertussis reported in that city during a 6-year period occurred in infants too young to be fully immunized.

"Young infants are especially vulnerable to potential pertussis infection because they are not fully protected from the disease until they receive the last of three [diphtheria, tetanus, and pertussis] vaccines at 6 months," she said.

Similarly, in a study out of Seattle, children younger than 1 year—and particularly infants younger than 6 months—had the highest incidence of reported pertussis during a 5-year period. And, according

to lead investigator Dr. Christopher Czaja of the University of Washington, a majority of the infant cases were linked to a household member as the likely source of infection.

The problem, according to Dr. Daskalaki, is that "a lot of people don't realize [pertussis] is out there."

And more still don't realize there's something they can do to protect themselves and their children. "Everyone should receive a Tdap [tetanus, diphtheria, and acellular] pertussis booster vaccine to help decrease the burden of disease. With less whooping cough around, young infants who are most vulnerable would have less possibility to be exposed," she said.

Minority infants, particularly Hispanic infants, have an even greater risk of infection because of the increased prevalence of the disease in minority populations, according to Kathryn Wymore of the California Emerging Infections Program in Oakland.

In the third tracking study presented, Ms. Wymore and her colleagues determined that 76 of 160 (48%) cases of infant pertussis in three San Francisco-area counties reported between 2000 and 2004 occurred among Hispanics.

"The average annual incidence of dis-

ease per 100,000 infants was 127.1 among Hispanics and 55.8 among non-Hispanics, which is consistent with national surveillance data," she said.

There was no difference in clinical outcomes between the Hispanic and non-Hispanic infants, however. Among all of the cases reported, "one infant died from the infection, 14% had pneumonia, and 77% were hospitalized," she said.

In the Philadelphia study, of 409 cases of reported pertussis, 41% occurred in African American patients and 11% in Hispanic patients. Among the 176 infected infants, 54% were African American and 18% were Hispanic. Given these findings, it's especially imperative to target Tdap booster strategies toward difficult-to-reach populations, Dr. Daskalaki stressed, adding that "the implementation rate of adult vaccination has to be really high in order to have a chance of protecting infants."

While boosting immunization rates is one component of an effective public health strategy, building physician awareness of the disease in the community is another. In the Seattle study, investigators determined that 15% of all of the patients and one-third of the infants younger than 1 year diagnosed with pertussis during the 5-year

study period had been seen by a doctor at least three times before being correctly diagnosed. "Doctors are just not thinking of whooping cough, but they should be in any person with prolonged cough, because earlier diagnosis could decrease disease transmission," said Dr. Czaja.

The Seattle study showed significant increases in pertussis infections among adolescents and adults between 2000 and 2005, "which explains the significant increase among infants," according to Dr. Czaja.

In the 5-year study period, pertussis cases increased from a low of 39 in 2001 to a peak of 280 in 2003, with 192 cases reported through August 2005. Although the highest incidence occurred in children younger than 1 year, peaking at 202 per 100,000 in 2003, "the greatest rise in incidence was among people 20 years and older, with an 11-fold increase, followed by adolescents and teens between 10 and 19 years, with an almost sixfold increase," he said, adding that in 62% of cases that involved an infant, "a household member was identified as the likely source of infection."

"Although the disease tends to be mild in adolescents and adults, it can be quite serious in infants," Dr. Czaja said. ■