Thimerosal in Vaccine Not Seen as Risky for Infants

BY HEIDI SPLETE
Senior Writer

Infants excrete the ethyl mercury used in thimerosal-containing vaccines too quickly for the mercury to build up in their systems, according to a recent study.

The findings may help to quell chronic concerns that thimerosal-containing vaccines can increase a child's risk for developmental problems, such as autism. These concerns led to the removal of thimerosal from most vaccines given to children in the United States and Europe as of March 2001, although it remains a component of vaccines used in other countries.

DR. PICHICHERO

Previous studies have described how the body processes methyl mercury—the type associated with the consumption of fish—but so far, few studies have examined how the body processes ethyl mercury after exposure via intramuscular injection.

In this study, Dr. Michael Pichichero of the University of Rochester (N.Y.), and his colleagues evaluated the ethyl mercury in blood, urine, and stool samples from 216 healthy children prior to vaccination with thimerosal-containing vaccines and again at several points between 12 hours and 30 days after vaccination, depending on the age group.

The study population included 72 newborns, 72 2-month-old infants, and 72 6-month-old infants who were vaccinated at a children's hospital in Argentina between February 2003 and February 2004 (Pediatrics 2008;121:e208-14).

The main hypothesis of the study was that ethyl mercury does not stay long in the bloodstreams of vaccinated infants. Complete pre- and postvaccination blood samples were available from 128 children (59%): 40 newborns, 50 2-month-olds, and 38 6-month-olds.

Overall, the blood mercury levels in all three age groups were highest at the first postvaccination measurements—12 hours after vaccination for newborns and 24 hours after vaccination for the 2-month-olds and 6-month-olds.

The blood half-life of mercury after administration was estimated to be 3.7 days, and did not vary by age group.

In all of the age groups, blood mercury levels quickly dropped and the levels in most of the children had returned to normal by 11 days after vaccination.

The average maximal blood mercury levels following vaccinations for the newborns, 2-month-olds, and 6-month-olds were 5.0 ng/mL, 3.6 ng/mL, and 2.8 ng/mL, respectively.

Even the highest level of mercury was relatively low. The overall highest level detected in the study was 8.0 ng/mL, and it was noted in a newborn 12 hours after a birth dose of a hepatitis B virus (HBV) vaccine that included 32.5 mcg of mercury.

Another important finding was that the prevaccination levels among the 6-month-olds were not higher than the prevaccination levels among the 2-month-olds. This suggests that ethyl mercury does not accumulate in the blood as a result of exposure to thimerosal-containing vaccines, the researchers commented.

"Using a model that accounted for baseline mercury levels, ethyl mercury dosage, and timing of vaccination, we estimated the blood half-life of mercury after administration of thimerosal to be 3.7 days, which did not vary significantly by age group," the researchers wrote.

"This study is very timely for something that pediatricians are going to be facing," Dr. Pichichero said in an interview. The ABC-TV network recently aired the debut of a fictional series about a lawyer, "Eli Stone," that suggested a conspiracy between vaccine companies and physicians to keep an association between vaccines and autism under wraps.

The overall highest level of mercury was a relatively low 8.0 ng/mL, noted in a newborn 12 hours after a dose of HBV vaccine that had 32.5 mcg of mercury.

"So every pediatrician in America is going to face parents who see this fictional program," added Dr. Pichichero. "We are going to have parents wondering whether their doctors are in cahoots with the vaccine companies."

Dr. Pichichero feels that this study virtually eliminates the argument that mercury can accumulate to unsafe levels in children as a result of standard infant vaccinations. "Our study shows beyond a shadow of a doubt that that is not true given how quickly ethyl mercury disappeared from the blood," he said.

In fact, inorganic mercury was found in almost all the stool samples in all age groups. Mercury levels in the stool increased shortly after vaccinations in all age groups, but then they began to decline, which suggests that the mercury is leaving the body in the stool, Dr. Pichichero said. By contrast, the urine samples in all age groups showed barely detectable levels of mercury, which suggests that the kidneys are likely not affected, he added.

The results were limited by the combination of methyl and ethyl mercury in the blood samples from some children and by the researchers' inability to identify the exact proportion of mercury excreted through the stool and urine.

However, the short half-life of ethyl mercury in the blood suggests a need to reassess the risk of thimerosal as a preservative, they wrote.

Dr. Pichichero is an unpaid consultant for the World Health Organization on vaccine-related issues, and he has served as a consultant to several vaccine manufacturers including GlaxoSmithKline Biologicals, Sanofi Pasteur, Wyeth Pharmaceuticals, MedImmune, and Merck & Co.

The findings support results from recent studies, including a study conducted by the Centers for Disease Control and Prevention that showed no association between exposure to ethyl mercury from thimerosal-containing vaccines during infancy and neuropsychological outcomes at age 7-10 years (N. Engl. J. Med. 2007; 357:1281-92).

Additionally, a population-based study that was conducted in California last year showed an increase in the prevalence of autism in the years since thimerosal-containing vaccines were discontinued (Arch. Gen. Psychiatry 2008;65:19-24). ■

MMR Shot Not Linked to Autism, According to U.K. Study

BY JONATHAN GARDNER
Contributing Writer

Children with autism spectrum disorder had no greater immune response to the measles virus or the measles component of the measles, mumps, and rubella vaccine than did children without the disorder in a large case-control study

Writing in the Archives of Disease of Childhood, British researchers said that their community sample study of 250 children aged 10-12 years is the largest to date to fail to demonstrate any association between MMR vaccination and autism spectrum disorder (ASD) "using well-validated techniques."

There were no differences in the distribution of measles antibodies or virus in the children with autism spectrum disorder or the controls.

Concern about the possible connection has led to lower MMR vaccination rates, from 92% in 1995-1996 to 80% in 2004, according to UK Health Protection Agency data cited by the researchers (Arch. Dis. Child. 2007 Feb. 5 [Epub doi:10.1136/adc.2007.122937]).

Led by Dr. Gillian Baird of Guy's and St. Thomas' National Health Service Trust in London, the researchers said uptake of the second MMR vaccination was lower in the children who had autism or autism spectrum disorder than in the control population without autism (29% vs. 50%).

Children with special education needs but not autism spectrum disorder had lower vaccination rates than normal developing children.

These differences in uptake between groups "may reflect parental concern about vaccination following a diagnosis of developmental abnormality," the researchers wrote.

Four of the authors listed conflicts of interests relating to lawsuits against manufacturers of the MMR vaccines, including Dr. Baird, who has served as an expert witness.

The researchers drew their subjects from a cohort of 56,946 children born between July 1, 1990, and Dec. 31, 1991, from the South Thames region of England.

After screening for autism spectrum disorders and special educational needs, the researchers identified 98 cases of autism spectrum disorders. The cases were compared to 52 control children who had special educational needs but no diagnosis of autism, along with 90 control children with typical development.

The researchers analyzed blood from the subjects to determine whether they had persistent measles infections or abnormally high measles antibodies.

They found no differences in the distribution of measles antibodies or virus in the children with autism spectrum disorder or the controls, regardless of whether children had received one or both of the MMR vaccinations.

There also was no sign of altered persisting immunological response in autism spectrum disorder cases, in those with or without a history of regression.

Regression of language was defined as a loss of at least five words used communicately during a 3-month period, or, in those who had not achieved the five-word stage, "a reported regression of words or skills in social communicative or play behavior."

Authors of a case series published in 2000 had described a condition referred to as "autism enterocolitis," postulated to be associated with the MMR vaccine and regression in autism.

Researchers in the current study found no evidence of increased enterocolitis in the autism spectrum disorder group with regression.

Only one child in the study had "possible enterocolitis," and this child was from a control group

The researchers said their study is strong because of its size, the geographic definition of its sample, good vaccination histories, and a diagnostic procedure that allowed researchers to identify a dose-response relationship between autism symptoms and antibody levels.

However, Dr. Baird and his fellow investigators noted that the control population was not randomly selected, and might therefore have been biased.

The children's parents were informed it was a study about MMR vaccination. ■

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