

Safety of Thimerosal-Containing Vaccines: A Two-Phased Study of Computerized Health Maintenance Organization Databases

Thomas Verstraeten, MD^{*,†}, Robert L. Davis, MD, MPH[‡], Frank DeStefano, MD, MPH[‡], Tracy A. Lieu, MD, MPH^{||}, Philip H. Rhodes, PhD[¶], Steven B. Black, MD[¶], Henry Shinefield, MD[¶] and Robert T. Chen, MD[¶] for the Vaccine Safety Datalink Team

* Epidemic Intelligence Service Program, Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, Georgia

† Vaccine Safety and Development Activity, Epidemiology and Surveillance Division, National Immunization Program, Centers for Disease Control and Prevention, Atlanta, Georgia

‡ University of Washington and Group Health Cooperative of Puget Sound, Seattle, Washington

|| Center for Child Health Care Studies, Department of Ambulatory Care and Prevention, Harvard Pilgrim Health Care and Harvard Medical School, and Division of General Pediatrics, Children's Hospital, Boston, Massachusetts

¶ Kaiser Permanente Vaccine Study Center, Oakland, California

Objective. To assess the possible toxicity of thimerosal-containing vaccines (TCVs) among infants.

Methods. A 2-phased retrospective cohort study was conducted using computerized health maintenance organization (HMO) databases. Phase I screened for associations between neurodevelopmental disorders and thimerosal exposure among 124 170 infants who were born during 1992 to 1999 at 2 HMOs (A and B). In phase II, the most common disorders associated with exposure in phase I were reevaluated among 16 717 children who were born during 1991 to 1997 in another HMO (C). Relative risks for neurodevelopmental disorders were calculated per increase of 12.5 μ g of estimated cumulative mercury exposure from TCVs in the first, third, and seventh months of life.

Results. In phase I at HMO A, cumulative exposure at 3 months resulted in a significant positive association with tics (relative risk [RR]: 1.89; 95% confidence interval [CI]: 1.05–3.38). At HMO B, increased risks of language delay were found for cumulative exposure at 3 months (RR: 1.13; 95% CI: 1.01–1.27) and 7 months (RR: 1.07; 95% CI: 1.01–1.13). In phase II at HMO C, no significant associations were found. In no analyses were significant increased risks found for autism or attention-deficit disorder.

Conclusions. No consistent significant associations were found between TCVs and neurodevelopmental outcomes. Conflicting results were found at different HMOs for certain outcomes. For resolving the conflicting findings, studies with uniform neurodevelopmental assessments of children with a range of cumulative thimerosal exposures are needed.