

Research Article

The risk of neurodevelopmental disorders following a Thimerosal-preserved DTaP formulation in comparison to its Thimerosal-reduced formulation in the vaccine adverse event reporting system (VAERS)

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Abstract: Mercury (Hg) exposure in human infants and fetuses has long been known to be significantly associated with neurodevelopmental disorders (NDs). Thimerosal (49.55% Hg by weight) is an ethyl-Hg containing compound added to many childhood vaccines as a preservative. A hypothesis testing case-control study was undertaken in the Vaccine Adverse Event Reporting System (VAERS) database (updated through September 2013) by examining 5,591 adverse event reports entered following Thimerosal-preserved Diphtheria-Tetanus-acellular-Pertussis (DTaP) (TripediaTM, Sanofi) administered from 1997-1999 (exposed) and following Thimerosal-reduced DTaP (TripediaTM, Sanofi) administered from 2004-2006 (unexposed). Cases were defined as individuals with adverse event reports with the outcomes of autism, speech disorder, mental retardation, or ND (at least of one these aforementioned specific outcomes being mentioned in the adverse event report). Controls were defined as individuals with adverse event reports without any mention of the specific case outcomes examined. Cases reported with the outcomes of autism (odds ratio = 7.67, $p < 0.0001$), speech disorders (odds ratio = 3.49, $p < 0.02$), mental retardation (odds ratio = 8.73, $p < 0.0005$), or ND (odds ratio = 4.82, $p < 0.0001$) were significantly more likely than controls to have received Thimerosal-preserved DTaP vaccine (exposed) in comparison to Thimerosal-reduced DTaP vaccine (unexposed). Though routine childhood vaccination is considered an important public health tool to reduce the morbidity and mortality associated with certain infectious diseases, this study supports a significant relationship between increased organic-Hg exposure from Thimerosal-preserved childhood vaccines and the child's subsequent risk of a ND diagnosis.

Keywords: autistic, developmental delay, ethylmercury, merthiolate, language, thiomersal

Introduction

Mercury (Hg) is a heavy metal that is widespread and persistent in the environment, and infants in the US are exposed to significant levels of environmental Hg through

air, water, and breast milk [1]. In addition to environmental Hg exposure and maternal exposures from the mother's Hg body burden, dietary intakes, and Hg-containing pharmaceuticals administered to the mother while the child is developing in utero, and injected organic-Hg from