

Thimerosal Exposure in Early Life and Neuropsychological Outcomes 7–10 Years Later

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Objective The authors used a public use data set to investigate associations between the receipt of thimerosal-containing vaccines and immune globulins early in life and neuropsychological outcomes assessed at 7–10 years. **Methods** The data were originally created by evaluating 1,047 children ages 7–10 years and their biological mothers. This study developed seven latent neuropsychological factors and regressed them on a comprehensive set of covariates and thimerosal exposure variables. **Results** The authors found no statistically significant associations between thimerosal exposure from vaccines early in life and six of the seven latent constructs. There was a small, but statistically significant association between early thimerosal exposure and the presence of tics in boys. **Conclusions** This finding should be interpreted with caution due to limitations in the measurement of tics and the limited biological plausibility regarding a causal relationship.

Key words children; modeling; neuropsychology; public health; structural equation.

Introduction

The association between exposure to thimerosal-containing vaccines and developmental outcomes has been debated since 1999 (Bernard, 2008; Clements, Ball, Ball, & Pratt, 2001; Offit, 2007; Rooney, 2008; Sugarman, 2007) when the Food and Drug Administration (FDA) determined that children who received multiple thimerosal containing vaccines at a young age were at risk for exceeding the Environmental Protection Agency's (EPA) safety limits for methylmercury (Ball, Ball, & Pratt, 2001; Stratton, Gable, & McCormick, 2001). EPA had never determined safety limits for ethylmercury, the compound found in thimerosal containing vaccines. EPA's methylmercury safety limits had been determined based on previous studies that found

associations between methylmercury exposure and neuropsychological outcomes (Crump, Kjellstrom, Shipp, Silvers, & Stewart, 1998; Grandjean et al., 1999). Specifically, the Faroe Island studies found that high levels of methylmercury exposure due to maternal consumption of mercury-contaminated fish during pregnancy have been associated with children exhibiting lower motor function and verbal skills at 7 years of age (Grandjean et al., 1999). As a precautionary measure, the U.S. Public Health Service recommended the removal of thimerosal from vaccines administered to children early in life and the Centers for Disease Control and Prevention (CDC) proceeded to sponsor several studies investigating the possible associations between exposure to thimerosal-containing vaccines