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Epidemiology

A cross-sectional study of the relationship between infant Thimerosal-containing hepatitis B vaccine exposure and attention-deficit/hyperactivity disorder

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that is inconsistent with developmental level and interferes with normal functioning in at least two settings. This study evaluated the hypothesis that infant Thimerosal-containing **hepatitis B vaccine** (T-HepB) exposure would increase the risk of an **ADHD** diagnosis. This **cross-sectional study** examined 4393 persons between 13 and 19 years of age from the combined 1999–2004 National Health and Nutritional Examination Survey (NHANES) by analyzing demographic, immunization, socioeconomic, and health-related variables using the SAS system. Three doses of T-HepB exposure in comparison to no exposure significantly increased the risk of an ADHD diagnosis using **logistic regression** (adjusted odds ratio = 1.980), **linear regression** (adjusted beta-coefficient = 0.04747), Spearman's rank (Rho = 0.04807), and 2×2 **contingency table** (rate ratio = 1.8353) statistical modeling even when considering other covariates such as gender, race, and socioeconomic status. Current health status outcomes selected on an *a priori* basis to not be biologically plausibly linked to T-HepB exposure showed no relationship with T-HepB. The observed study results are biologically plausible and supported by numerous previous epidemiological studies, but because the NHANES data is collected on a cross-sectional basis, it is not possible to ascribe a direct cause-effect relationship between exposure to T-HepB and an ADHD diagnosis. During the decade from 1991 to 2001 that infants were routinely exposed to T-HepB in the United States (US), an estimated 1.3-2.5 million children were diagnosed with ADHD with excess lifetime costs estimated at US \$350-\$660 billion as a consequence of T-HepB. Although **Thimerosal** use in the HepB in the US has been discontinued, Thimerosal remains in the HepB in developing countries. Routine **vaccination** is an important public health tool to prevent infectious diseases, but every effort should be made to eliminate Thimerosal exposure.



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Keywords

ADD; Attention deficit disorder; Ethylmercury; Mercury; Merthiolate; NHANES; Thiomersal

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