



Invited critical review

Making sense of epidemiological studies of young children exposed to thimerosal in vaccines

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ARTICLE INFO

Article history:

Received 24 May 2010

Received in revised form 8 July 2010

Accepted 10 July 2010

Available online 16 July 2010

Keywords:

Thimerosal

Ethylmercury

Infants

Newborns

Children

Neurodevelopment

Vaccines

ABSTRACT

Objective: To compare epidemiological studies dealing with neurological issues (compatible with Hg toxicity) linked to exposing newborns and infants to intramuscular doses of preservative-Hg resulting from vaccination with thimerosal-containing vaccines (TCV).

Methods: Major databases were searched for studies that addressed neurodevelopment outcomes other than autism. Eight studies were identified and compared.

Results: Information extracted from the studies done in the USA, the UK, and Italy is important in understanding the complex interplay of variables but insufficient to establish non-toxicity for infants and young children still receiving TCV: a) there is ambiguity in some studies reporting neurodevelopment outcomes that seem to depend on confounding variables; b) the risk of neurotoxicity due to low doses of thimerosal is plausible at least for susceptible infants; c) there is a need to address these issues in less developed countries still using TCV in pregnant mothers, newborns, and young children.

Conclusions: Since the use of TCV is still inevitable in many countries, this increases the need to protect vulnerable infants and promote actions that strengthen neurodevelopment. Developing countries should intensify campaigns that include breastfeeding among efforts to help prime the central nervous system to tolerate exposure to neurotoxic substances, especially thimerosal-Hg.

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1. Introduction

It is estimated that 3% of neurodevelopmental disabilities (NDD) are directly linked to environmental neurotoxic substances and that 25% of these disabilities may arise as a result of interaction with individual genetic susceptibilities [1]. Outside a handful of rich

countries, organic mercury (Hg) in the form of ethylmercury (EtHg) may be the first exposure a vaccinated infant has to a potentially neurotoxic substance such as mercury. EtHg is the metabolite of thimerosal widely used to preserve immunoglobulins (used by Rh-negative pregnant women) and vaccines that are given to pregnant mothers, newborns, infants, and young children.

Because the child is healthy when he/she takes vaccines, adverse events caused by vaccination are monitored to insure vaccine safety. Neurological syndromes and diseases may appear as a result of vaccine's antigens [2–4]; however, in the case of vaccine-thimerosal

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