INTRODUCTION

Prenatal exposure to neurotoxic substances can cause morphological and functional anomalies in infants; Hg is one such substance. Long-term risk of neurological conditions or diseases can be the result of adverse responses to in utero exposures to environmental chemicals (arising from occupational hazards, drugs and tobacco smoking). Depending on the exposure, these chemicals can affect the central nervous system (CNS) leading to neurodevelopmental disabilities or can cause subtle changes capable of inducing adaptive responses (1); some of these responses are only noticeable through changes in behaviour in later years. Better protection of the CNS during the most vulnerable time includes avoiding exposure or remedying some of these early effects through breastfeeding (2).

Despite the universal use of small amounts of thimerosal as a preservative of vaccines since the 1930s, research on its toxicokinetics and toxicodynamics in neonates and infants is rare and very limited; and, as a consequence, knowledge of its Hg metabolite (ethylmercury – etHg) is derived mostly from methylmercury (meHg) studies. The mechanistic understanding of organomercurials’ neurotoxicity is unquestionable, and etHg is no exception. However, our ability to understand the safety of small quantities of etHg derived from thimerosal-containing vaccines (TCV) is still unsatisfactory (3); its limited toxicological understanding is the result of studies in animals and theoretical models (4). Although there is no proven causation of permanent neurological disorders in children exposed to TCV-etHg, its plausibility has been inferred from neurotoxic disasters caused by accidental exposure to high levels of organic Hg compounds (5).

The infant brain takes unusually a long period to form, with some higher functions being sensitive to initial anatomical and physiological conditions. Thus, the vulnerability of the developing brain to neurotoxic substances is amply recognized (6). Organic Hg compounds are among the neurotoxic substances whose effects depend on the CNS structure at time of exposure (6). Therefore, the use of TCV during pregnancy has been cautioned (3,7,8). Schilthuis and van Wijnen (9) raised an alert about the risk of thimerosal-containing gammaglobulin preparations for the prevention of hepatitis A in pregnant women, recommending alternatives without thimerosal. However, in the case of the tetanus vaccine, it has never been questioned (10). Tetanus vaccines are strategically used to increase protection of mothers and neonates and are considered safe. However,