

Mercury and autism: Accelerating Evidence?

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Abstract

The causes of autism and neurodevelopmental disorders are unknown. Genetic and environmental risk factors seem to be involved. Because of an observed increase in autism in the last decades, which parallels cumulative mercury exposure, it was proposed that autism may be in part caused by mercury. We review the evidence for this proposal. Several epidemiological studies failed to find a correlation between mercury exposure through thimerosal, a preservative used in vaccines, and the risk of autism. Recently, it was found that autistic children had a higher mercury exposure during pregnancy due to maternal dental amalgam and thimerosal-containing immunoglobulin shots. It was hypothesized that children with autism have a decreased detoxification capacity due to genetic polymorphism. In vitro, mercury and thimerosal in levels found several days after vaccination inhibit methionine synthetase (MS) by 50%. Normal function of MS is crucial in biochemical steps necessary for brain development, attention and production of glutathione, an important antioxidative and detoxifying agent. Repetitive doses of thimerosal leads to neurobehavioral deteriorations in autoimmune susceptible mice, increased oxidative stress and decreased intracellular levels of glutathione in vitro. Subsequently, autistic children have significantly decreased level of reduced glutathione. Promising treatments of autism involve detoxification of mercury, and supplementation of deficient metabolites.

Abbreviations

MTHFR	- methylene tetrahydrofolate reductase
Hg	- mercury
DMSA	- dimercaptosuccinic acid
DMPS	- sodium 2,3-dimercapto-1-propane sulfonate
MS	- methionine synthetase
ASD	- autism spectrum disorders

Introduction

Autism spectrum disorders (ASD), first described in 1943 in eleven children born in the 1930s, have increased worldwide [1,2,3,4]. All forms of mercury are neurotoxic, especially during brain development [5,6]. Thus, some authors

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