

# A Case Series of Children with Apparent Mercury Toxic Encephalopathies Manifesting with Clinical Symptoms of Regressive Autistic Disorders

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Impairments in social relatedness and communication, repetitive behaviors, and stereotypic abnormal movement patterns characterize autism spectrum disorders (ASDs). It is clear that while genetic factors are important to the pathogenesis of ASDs, mercury exposure can induce immune, sensory, neurological, motor, and behavioral dysfunctions similar to traits defining or associated with ASDs. The Institutional Review Board of the Institute for Chronic Illnesses (Office for Human Research Protections, U.S. Department of Health and Human Services, IRB number IRB00005375) approved the present study. A case series of nine patients who presented to the Genetic Centers of America for a genetic/developmental evaluation are discussed. Eight of nine patients (one patient was found to have an ASD due to Rett's syndrome) (a) had regressive ASDs; (b) had elevated levels of androgens; (c) excreted significant amounts of mercury post chelation challenge; (d) had biochemical evidence of decreased function in their glutathione pathways; (e) had no known significant mercury exposure except from Thimerosal-containing vaccines/Rho(D)-immune globulin preparations; and (f) had alternate causes for their regressive ASDs ruled out. There was a significant dose-response relationship between the severity of the regressive ASDs observed and the total mercury dose children received from Thimerosal-containing vaccines/Rho (D)-immune globulin preparations. Based upon differential diagnoses, 8 of 9 patients examined were exposed to significant mercury from Thimerosal-containing biologic/vaccine preparations during their fetal/infant developmental periods, and subsequently, between 12 and 24 mo of age, these previously normally developing children suffered mercury toxic encephalopathies that manifested with clinical symptoms consistent with regressive ASDs. Evidence for

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mercury intoxication should be considered in the differential diagnosis as contributing to some regressive ASDs.

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Autism is a neurodevelopmental syndrome characterized by impairments in social relatedness and communication, repetitive behaviors, and stereotypic abnormal movement patterns (California Department of Developmental Services, 2003). While genetic factors are recognized as being important in the pathogenesis of autistic disorders, the role for environmental factors has received considerable attention. Researchers have previously reported that exposure to mercury can produce immune, sensory, neurological, motor, and behavioral dysfunctions similar to traits defining or associated with autistic disorders, and these similarities extend to neuroanatomy, neurotransmitters, and biochemistry (Bernard et al., 2001, 2002; Blaxill et al., 2004; Redwood et al., 2001). Furthermore, recent research observing children's communicative, social, affective and repetitive behaviors and toy play coded from videotapes of the toddlers' first and second birthday parties revealed there are children with regressive autistic disorders that manifest between the ages of 12 and 24 mo (Werner & Dawson, 2005), a temporal period concurrent with exposure of these children to mercury from Thimerosal-containing biologics/vaccines in the U.S. standard immunization schedule.

## MATERIALS AND METHODS

### Participants

The Institutional Review Board of the Institute for Chronic Illnesses (Office for Human Research Protections, U.S. Department of Health and Human Services, IRB number IRB00005375) approved the present study. This study examines the cases of nine pediatric patients with neurodevelopmental disorders who presented to the Genetic Centers of America from June 2005 through February 2006 for outpatient genetic/developmental evaluations.

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David Geier has been a consultant in vaccine/biologic cases before the no-fault National Vaccine Injury Compensation Program (NVICP) and in civil litigation. Dr. Mark Geier has been an expert witness and a consultant in vaccine/biologic cases before the no-fault NVICP and in civil litigation.

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