SHORT COMMUNICATION

Gender-selective toxicity of thimerosal

Donald R. Branch\textsuperscript{a,b,c,*}

\textsuperscript{a}Departments of Medicine and Laboratory Medicine and Pathobiology, University of Toronto, 67 College St., Toronto, Ontario, Canada M5G 2M1
\textsuperscript{b}Division of Cell and Molecular Biology, Toronto General Research Institute, Toronto, Ontario, Canada
\textsuperscript{c}Research and Development, Canadian Blood Services, Immunology Hub, Toronto Centre, Toronto, Ontario, Canada

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Abstract

A recent report shows a correlation of the historical use of thimerosal in therapeutic immunizations with the subsequent development of autism; however, this association remains controversial. Autism occurs approximately four times more frequently in males compared to females; thus, studies of thimerosal toxicity should take into consideration gender-selective effects. The present study was originally undertaken to determine the maximum tolerated dose (MTD) of thimerosal in male and female CD1 mice. However, during the limited MTD studies, it became apparent that thimerosal has a differential MTD that depends on whether the mouse is male or female. At doses of 38.4–76.8 mg/kg using 10% DMSO as diluent, seven of seven male mice compared to zero of seven female mice tested succumbed to thimerosal. Although the thimerosal levels used were very high, as we were originally only trying to determine MTD, it was completely unexpected to observe a difference of the MTD between male and female mice. Thus, our studies, although not directly addressing the controversy surrounding thimerosal and autism, and still preliminary due to small numbers of mice examined, provide, nevertheless, the first report of gender-selective toxicity of thimerosal and indicate that any future studies of thimerosal toxicity should take into consideration gender-specific differences.

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Introduction

Thimerosal is an organic compound that contains mercury and has been used historically as a preservative in vaccines and pharmaceutical products. The breakdown product, ethylmercury, in thimerosal-preserved childhood vaccines has been suggested to be neurotoxic and to contribute to the etiology of neurodevelopmental disorders, including autism; however, this supposition is highly controversial (Mutter et al., 2005; Geier et al., 2007; Ng et al., 2007; Zareba et al., 2007; Thompson et al., 2007, Schechter and Grether, 2008). It has, however, been shown that mercury and thimerosal administration results in the decreased production of