



Misinformed parents, unvaccinated children and the fabricated vaccine-autism scare

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Editorial

It all started in February of 1998 when Dr. Andrew Wakefield and his colleagues published a study in a British medical journal called *The Lancet*. Their report suggested that the administration of the measles, mumps, and rubella (MMR) vaccine during infancy was associated with the onset of autism [1]. Despite the poor quality of the study design and the lack of proven causality, its publication led to decreased vaccination rates across the United States [2]. Design flaws such as a small sample size, gender bias within the sampling, and the lack of control subjects, were all clearly ignored by the media's presentation to the public. In 2010, Wakefield's article was retracted; however, to this day, many individuals continue to believe that there are hazardous consequences from vaccinating their children. Reliable scientific evidence suggests that the administration of the MMR vaccine does not cause autism and has decreased the incidence of disease worldwide [3]. Along with other vaccines approved by the Food and Drug Administration, MMR should continue to be administered as a standard public health requirement.

Soon after Wakefield's article was published, an additional association between thimerosal and autism was conceived within the public's perception [4]. Thimerosal is a mercury-based preservative that is sometimes added to multi-dose vaccine preparations in order to prevent bacterial growth within the vial while it is stored. Parents feared that administering vaccines containing thimerosal to their children at a young age resulted in harmful quantities of mercury in the blood, which, in turn, lead to autism. Mercury poisoning typically presents as diminished peripheral vision, sensation disturbances, ataxic gait, and speech/hearing problems, all of which are considered atypical if they present in an autistic child. Similarly, thimerosal is only used in multi-dose storage of inactivated viruses like influenza and is never used to store live vaccines like MMR [5,6]. Regardless of these contradictions, thimerosal got equally significant public attention forcing the Public Health Service and the American Academy of Pediatrics to discontinue the use of thimerosal in all childhood immunizations in 1999.

Vaccines are one of the most valuable public health interventions of the millennium. They effectively prevent an estimated 2-3 million disease related childhood deaths each year and have allowed for complete eradication of fatal diseases such as smallpox [7,8]. Although some children develop a fever after receiving a vaccine as part of the inflammatory immune response, the existing evidence favors rejection of any causal relationship between any vaccine and autism [8,9]. The only adverse effects that have been reported in healthy children are fever-induced seizures (about 1 out of 3,000 doses) and a bleeding disorder known as thrombocytopenic purpura (about 1 out of 30,000 doses) [10]. These symptoms have yet to be causally associated with any vaccine administration and are clearly very rare upon review of the reported probability statistics [11]. Likewise, none of these adverse side effects are even closely suggestive of autism and must be appropriately evaluated against the vaccine's protective benefits.

Much of the public remains misinformed and continues to believe in Wakefield's research. After the content of the article was disclosed to the public, many parents became afraid of vaccinating their children. The fact that vaccines have eliminated a huge burden of disease across the world quickly became compromised after Wakefield's article captured public attention. MMR vaccination rates declined and several measles outbreaks occurred in both the United Kingdom and the United States [6,10]. Parents must be reminded that vaccines are not only administered as a way of preventing disease in their own child, but are equally important in preventing the spread of disease within the population.

Some of the more recent published evidence suggests a genetic basis as the cause of autism [12,13]. No matter what the data indicates in terms of vaccine safety, some parents, especially those who are poorly informed, will continue to resist vaccination efforts as a result of the MMR-autism scare. As the media continues to use fear based publicity strategies, science will continue to challenge the content of their messages with the public's health and safety in mind. Though science wins in terms of quality of content, the media may continue to perpetuate

false beliefs within popular culture.

Competing interests

The author declares that she has no competing interests.

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