MMR Vaccine and Autism: Vaccine Nihilism and Postmodern Science

GREGORY A. POLAND, MD

Nothing is more terrible than to see ignorance in action.

Johann Wolfgang von Goethe

It is a truism that acting in one’s perceived self-interest is not always in one’s self-interest. Perhaps nowhere is this truer in contemporary public health than for the issue of the measles-mumps-rubella (MMR) immunization and persistent fears about a possible connection with autism. Although each of these 3 diseases had been controlled in the United States with the widespread use of the MMR vaccine, in the past decade those gains have been slipping. Even though the United States has had fewer than 50 measles cases per year during the past decade (mostly imported from other countries), 156 cases have already been identified in the first 6 months of 2011.1 European countries such as England, Wales, Italy, France, Spain, and Germany are also experiencing substantial increases in measles outbreaks.

Why should we be concerned? Measles is the most transmissible human disease known. Even with modern medical care, approximately 1 of every 3000 infected persons die, and many more are hospitalized or otherwise harmed as a result. Population coverage (herd immunity) needs to be in excess of 96% to prevent outbreaks. In addition, measles is a disease for which eradication is both possible and planned, a goal that obviously cannot be met given current vaccine coverage levels.

This predictable sequence of falling coverage levels, followed by outbreaks of disease, has occurred because of decreased public confidence in the safety of the MMR vaccine. In large part, this has resulted from incorrect assertions that the vaccine plays a role in the development of autism, an idea promoted by Andrew Wakefield.2,3 No credible scientific evidence, however, supports the claim that the MMR vaccine causes autism, and indeed, national medical authorities and scientific professional societies have unanimously denounced that claim.4,5 More than 20 studies have found no evidence of connection between receipt of the MMR vaccine and autism disorders.6,7 In fact, Britain’s General Medical Council determined after its hearings that Wakefield was guilty of dishonesty and serious professional misconduct with regard to his MMR-autism research.8 More recently, the editor of the British Medical Journal published a commentary stating that Wakefield’s MMR-autism research was clearly fraudulent.9

Why in the face of nearly 2 dozen studies and every scientific committee rejecting such an MMR-autism connection does this myth persist? I and others have written extensively about the antivaccine movement and its negative effect on vaccine decision making, and on the role of the media in fostering fear.10-12 A recent example is worth examining. The Pace Environmental Law Review published an article concluding that a “preliminary evaluation” of cases compensated through the Vaccine Injury Compensation Program (VICP) “suggests that vaccine-induced encephalopathy and seizure disorder may be associated with autism.”13 Despite the fact that numerous studies have failed to find such a connection, substantial media attention was given to this article, undoubtedly causing further fear and confusion in the minds of the public. To the extent the authors intended to suggest that vaccines like MMR cause or contribute to autism, their conclusion is not only incorrect but also at odds with the work of the VICP itself.

Such a conclusion cannot be reconciled with the overwhelming body of scientific research. The Centers for Disease Control and Prevention (CDC), for example, has concluded that “carefully performed scientific studies have found no relationship between MMR vaccine and autism”16 and “no increased risk of [autism spectrum disorder] associated with receipt of thimerosal-containing vaccines.”17 (Note, thimerosal contains ethylmercury, another target of those who attack the safety of MMR vaccine.) Similarly, the Institute of Medicine concluded that the “body of epidemiological evidence favors rejection of a causal relationship between the MMR vaccine and autism,”18 and “between thimerosal-containing vaccines and autism.”19 Other organizations, including the American Academy of Pediatrics, have reached similar conclusions.19,20

More importantly for current purposes, the VICP itself—after conducting the most extensive and elaborate fact-finding proceedings in its history—concluded there is no causal connection between childhood vaccines and autism. After considering the evidence, one special master stated that “numerous medical studies...performed by

From the Mayo Clinic Vaccine Research Group, Mayo Clinic, Rochester, MN.

Dr Poland chairs data monitoring and safety committees for Merck Research Laboratories that oversee the safety of clinical trials for novel, non-measles vaccines. He holds a patent for the discovery of measles virus-derived peptides but has not received royalties for this work.

Individual reprints of this article are not available. Address correspondence to Gregory A. Poland, MD, Director, Mayo Vaccine Research Group, Director, Program in Immunovirology and Biodefense, Mayo Clinic, 200 First St. SW, Rochester, MN 55905 (poland.gregory@mayo.edu).

© 2011 Mayo Foundation for Medical Education and Research.

medical scientists worldwide have come down strongly against" the contention "that the MMR vaccine can cause autism." In another case, the special master found that "the evidence is overwhelmingly contrary to the petitioners' contentions...that thimerosal-containing vaccines can contribute to the causation of autism."

In the face of these epidemiological studies and the specific findings of the VICP, the authors of the Pace Environmental Law Review article look to isolated language found in a handful of decisions by the VICP during the past 2 decades and interviews with parents in some settled cases to suggest that some association may exist between vaccines and autism and that scientific and governmental entities may not have been forthcoming in their conclusions (shades of conspiracy), concluding with a call for "Congress to investigate the VICP...." Their efforts to draw conclusions from their flawed analysis, however, misconceive how the VICP works.

Congress enacted the no-fault compensation VICP so that damage awards could be provided "quickly, easily, and with certainty and generosity." The VICP operates partly on the basis of a Vaccine Injury Table, which includes all vaccines recommended by the Advisory Committee on Immunization Practices for routine administration to children. The secretary of the Department of Health and Human Services has specified certain conditions that may be associated with the vaccines listed on the table. The program offers 2 avenues for compensating a claimant who requests recovery: (1) by proving both that she/he received a "table vaccine" and experienced one of the conditions identified on the table, known as a "table injury," within a specified period, or (2) by proving that she/he received a "table vaccine" and that it caused the subsequent injury or death, which must be established by a preponderance of the evidence.

Importantly, a claimant can recover damages under the VICP without proving that a vaccine actually caused his or her alleged injury; it is enough for the claimant to demonstrate that she/he sustained one of the identified conditions during the designated period after administration of the vaccine. Autism is not now—and never has been—one of the specified injuries. Moreover, even for injuries not on the table, the authors of the Pace Law Review article do not identify any case in which the VICP has concluded that a vaccine caused autism. To the contrary, "in every claim submitted ..., the Health Resources and Services Administration has maintained and continues to maintain that vaccines do not cause autism, and has never concluded in any case that autism was caused by vaccination."

Thus, despite the media attention paid to the Pace Law Review article, its conclusions are flawed, and calls for yet more research into an MMR vaccine and autism connection are misguided. At a time when competition for limited federal research dollars is intense, it is important to focus resources on helping those with autism in meaningful ways—by understanding what causes autism and how its manifestations can be ameliorated, so that anyone who has the condition can lead a healthier and more productive life. Therefore, it is past time to put the myth that vaccines are at fault firmly to rest.

** MOVING FORWARD **

So how should members of the public, the media, health care professionals, policy makers, and other interested persons respond? The way forward is clear. Because no credible evidence during the past 13 years supports the hypothesized connection between the MMR vaccine and autism disorders, it is bereft of credible evidence and must be discarded. At the same time, autism is a public health concern that must be addressed by enhancing research funding and directing that funding toward studies of credible hypotheses of causation. To continue pouring money into futile attempts to prove a connection to the MMR vaccine when multiple high-quality scientific studies across multiple countries and across many years have failed to show any hint of a connection, and in the face of biologic nonplausibility, is dangerous and reckless of lives, public funding, and ultimately public health.

At some point, a point I believe we have well passed, the small group of people who claim such connections, who have no new or credible data, and for which their assumptions and hypotheses have been discredited must simply be ignored by scientists and the public and, most importantly, by the media, no matter how passionate their beliefs to the contrary. Such individuals are denialists at best, and dangerous at worst. Unfortunately, the media has given celebrities who comment on an autism-MMR link far more attention than they deserve, and the public, unfamiliar with the background science, has confused celebrity status with authority. Such a phenomenon has not been lost on those wishing to continue the discussion. As an example, J. Hanlon, cofounder of Generation Rescue (an organization that advocates for an autism-MMR vaccine link) commented, in regard to the finding that both Andrew Wakefield and his assertion of a connection between autism and MMR vaccine had been discredited, that those who believe vaccines cause autism "Andrew Wakefield was Nelson Mandela and Jesus Christ all wrapped in one."

Another important step is to insist on responsible and scientifically informed media reporting. Continued widespread "hyping" of dramatic "revelations" about MMR vaccine and autism disorders, conspiracy theories, and other misinformation is simply irresponsible and cruel to not only the public, but also particularly to individuals
and families who have a loved one with autism. To continue such scientifically uninformed reporting in and of itself needlessly increases fears and distrust about vaccine safety, and leads to parental confusion and decisions to not immunize their children—with predictable and disastrous outcomes.

Ultimately, however, there are no magical solutions to the deep divide between those who accept the scientific method and evidence and those who do not and simply choose to disbelieve the evidence. 31 Risk perception and cognitive biases are only partly amenable to reason and education; at some point, usually a point at which public harms are evident (such as protecting vulnerable populations against highly transmissible diseases), further action must be taken and laws enacted. For example, to protect drivers, their passengers, and the public, we make laws requiring seat belt use. We need discussion on similar measures regarding the use of vaccines, confined to the narrow and limited realm of preventing outbreaks of highly transmissible diseases that threaten the public health.

For anyone adhering to the scientific model of discovery, experimentation, and evidence, the trial is over and the jury back—there is no known scientific association between receipt of MMR vaccine and the subsequent development of autism. Making the decision to not immunize children with the MMR vaccine because of fear of such an association—rather than credible scientific evidence—places children and others at great risk as current measles outbreaks in the United States and Europe illustrate. Vaccine nihilists who continue to claim such associations are simply wrong, and they peddle an agenda other than for the public good. At this point, the antivaccine groups and conspiracy proponents promoting such an association should be ignored, much as thinking people simply ignore those who continue to insist that the earth is flat or that the US moon landing in 1969 did not really occur.

There is no law against being foolish, nor any vaccine against ignorance; however, in the meantime the health of millions of children in the United States and worldwide is being placed at unnecessary and real risk through continued deliberate misinformation and discredited unscientific beliefs, and that should be a crime.

I acknowledge the input and assistance of Randolph Moss, JD, in the preparation of the submitted manuscript.

REFERENCES


9. Godlee F, Smith J, Marcovich H. Wakefield’s article linking MMR vaccine and autism was fraudulent. BMJ. 2011;342:c7452.


27. Deer B. How the case against the MMR vaccine was fixed. BMJ. 2011;342:c7001.


