

Should Anti-Vaccines be Rejected?

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COLUMN ARTICLE

Vaccines have been a miracle of modern science that has saved millions of lives, eradicated a disease (smallpox), controlled many infectious diseases and improved our quality of life. At present, diseases preventable by vaccination occur much less in developed countries than before the introduction of vaccines. Despite this, the routine use of vaccines is threatened by a spectrum of fears, disinformation and anti-vaccination propaganda.

Despite the fact that in the last century the routine use of vaccines has achieved a notable decrease in the incidence of preventable infectious diseases and epidemics, widespread suspicion, distrust and anti-vaccination sentiment are at surprisingly high levels, in both United as in Western Europe and even in developing countries such as Africa, India and others.

There is a huge communication gap between scientists or doctors and anti-vaccines. However, doctors can influence health professionals, political leaders, the media, the public and, ultimately, patients and parents of children, to take into account the scientific method and the revised literature by the pairs.

History of the anti-vaccine movement

Anti-vaccines have existed since the vaccines were first used. Edward Jenner and Louis Pasteur faced fierce opposition to their vaccines against smallpox and rabies, respectively. In Great Britain, in the 1850s, there was an anti-vaccine league formed to oppose compulsory smallpox vaccination. Unlike the nineteenth century, no individual or group today calls itself “anti-vaccines” but are called The Rescue Generation, Global Research, Mothers Against Mercury, Safe Minds, Informed Parents, National Vaccine Information Center (National Vaccine Information Center), Release of Vaccines and Child Health Security (Child Health Safety).

A fundamental argument of anti-vaccines is that vaccines are not safe, an idea supported by those members of the public who feel that they or the vaccines harmed their loved ones.

Antigenic overload

Physicians should be aware that a recurring motto among the main anti-vaccines is that children receive too many vaccines (“too many vaccines” and “too soon”) and that this causes an antigenic overload.

The anti-vaccination argument further suggests that the schedule of vaccines with respect to children is “too early” for the “immature immune system” of infants and children, who are not able to process the multiple antigens of the vaccines. It is simple, attractive and popular to scientifically inform uninformed parents.

The anti-vaccines say that antigenic overload causes a “storm of cytokines” or “immune cascade” that triggers adverse events, although there is no scientific evidence to support this concept.

Four important lines of evidence contradict the concept of antigenic overload.

First, at the time of birth, babies are exposed to numerous microorganisms whose antigens far exceed the amount and variety of vaccines.

Second, studies on the efficacy and safety of pre-licensure vaccines have not found evidence of antigenic overload expressed in symptoms or signs of disease.

Third, studies conducted after the licensing of tens of billions of children who received the vaccine also found no evidence of antigenic overload or its consequences.

Fourth, in reality, babies and children receive less “antigenic exposure” today following the routine childhood immunization schedule than in the past.

Vaccines and autoimmunity

A second claim often promoted by anti-vaccines is that vaccines can lead to autoimmune diseases such as diabetes mellitus type 1, multiple sclerosis and Guillain-Barré syndrome.

French public health authorities considered that there was an association between vaccination with hepatitis B virus in adolescents and multiple sclerosis and this resulted in the suspension of the use of this vaccine in this subgroup in 1998. Despite this fear, no such association was found and the suspension was lifted, which constituted a shame for the French public health authorities, who had banned the vaccine based on public pressure and fear and not on scientific data. No association between vaccination with the

hepatitis B virus and an autoimmune disease such as multiple sclerosis has been scientifically reported.

However, there are temporary associations (not the same causality) between autoimmunity and vaccines, such as the one possibly existing between Guillain-Barré syndrome and the vaccine against the swine influenza virus in 1976, idiopathic thrombocytopenic purpura and measles-mumps-rubella (MMR) vaccine, acute disseminated encephalomyelitis and rabies vaccines based on tissue from the central nervous system of rabbits and myopericarditis and the smallpox vaccine.

Natural immunity versus immunity induced by vaccines

A third common complaint from anti-vaccines is that the immunity induced by the “natural” infection is safer than the immunity induced by the vaccine. The data are in opposition to such claims. For example, the risk associated with the development of the syndrome Guillain Barré associated with the influenza virus vaccine could very well be as high as one case per million doses of vaccine administered - although this association has not been demonstrated since the 1976 pandemic vaccination.

In contrast, the wild influenza virus in the United States killed approximately 1 in every 8,300 Americans per year (especially older people), while in the same country pandemic influenza virus H1N1 resulted in the loss of 2,000,000 years of life, between 2009 and 2010. The vaccine against the influenza virus does not cause myocarditis, pneumonia, bronchitis, sinusitis, or a significant amount of loss of employment and school hours, while it is very clear that commonly “natural” influenza can and in fact, does-cause these preventable comorbidities.

Although infection by the wild “natural” virus can itself result in superior immunity, compared to the immunization given by the individual vaccine, the population pays a high price to get only a small profit.

It is important to note that immunosuppressed children and adults who cannot receive live virus vaccines depend on the protection against natural infection and therefore on the high coverage rate given by the measles vaccine and the high immunity levels of the vaccine.

Thus, in summary, immunological studies support the general safety of routine vaccines in childhood and adults. There is no data to support the concept of antigenic overload, and “in fact, with routine vaccination we expose people to fewer antigens than in past decades”.

Damages derived from anti-vaccine movement

Public health officials consider routine vaccination to be one of the ten most important public health achievements of the 20th century, but anti-vaccines have carried out successful campaigns to block legislation and obligations for schools and nurseries and other health interventions designed to increase the uptake of vaccination.

The impact of anti-vaccines is not only a problem for rich countries, but it also threatens developing countries by the Internet, where they publish their false claims and diminish public confidence in vaccination throughout the world. Which increases the risk of more extensive outbreaks and new pandemics. However, so far, most research on the psychosocial aspects of the acceptability of vaccination has been carried out in industrialized countries, and attention should be paid to developing countries.

More recently, the movement against vaccines has accepted easily and without much criticism the false statements of Andrew Wakefield about the triple viral vaccine, which he related to the development of autism spectrum disorders. In 1998, Wakefield et al., in an article published in *The Lancet* entitled Nodular lymphoid ileal hyperplasia, nonspecific colitis and pervasive developmental disorder in children, reported a recently identified association of “a pattern of colitis and infantile lymphoid nodular ileal hyperplasia with Developmental disorders”.

Later, in a commentary in *The Lancet* published in 1999, Wakefield cited a virological study published in 1995, as evidence of an association between the measles virus and chronic intestinal inflammation. In an effort to request scientific rigor and academic integrity and accuse others of the lack of both, he cited a second study in which he also participated since 1998, in which measles virus RNA was not detected in inflammatory bowel disease. However, to counteract these negative studies, he later cited a third study, which he considered very positive.

However, numerous studies continued to demonstrate the absence of association between MMR vaccination and autism. Despite these studies that dismiss the allegations made by Wakefield and the recommendations based on the evidence of the US Institute of Medicine, and others, and despite the initial comment of the researchers at U.S. Centers for Disease Control and Prevention, on the possibility of a catastrophic “snowball” that suffers the worry resulting from this publication and its consequences in the population, the pandemonium occurred. Such claims have been widely discredited, and Wakefield has been stripped of his medical license and censored. However, many of the anti-vaccines consider him a hero of the cause and refuse to accept that these data are fatally flawed and false.

Over the past 13 years, since Wakefield first made its claims, the United Kingdom, the United States, Western Europe and other countries have experienced a decrease in vaccination with the MMR and MMR vaccine, and higher HIV/AIDS rates. Measles and mumps outbreaks. In 2011, Europe suffered large outbreaks of measles, more than 10,000 in France and thousands across the continent, leading to greater transmission to other continents, including the Americas, Australia and New Zealand. The outbreaks in Europe now involve 33 countries.

CONCLUSIONS AND CALL TO ACTION

Current data on all vaccines, all age groups and all formal recommendations indicate that vaccines are extraordinarily safe in the vast majority of patients for which they are recommended and are effective and appropriate for each use in the recommended age group.

No product made by man, including vaccines, is completely safe or perfectly effective, both at the individual and population level. The concerns against vaccines revolve around false immunological concepts. Allegations of damage or antigenic overload are deceptive and without scientific data to support such claims. On the contrary, the available scientific data fertilize the immunological value of vaccines by reducing morbidity and mortality, especially due to infectious diseases, and by improving the health of individuals and populations.

Misinformation and the lack of scientific knowledge must be counteracted by the public good and to combat the diffusion of false antivacuna concepts. It is expected that the doctors can do it and contribute their experience on this topic for the good of public health, informing them first to then fight against the immunological falsehoods spread by anti-vaccination groups.

The only rational way to proceed with the development of individual and public health policies with regard to the use of vaccines requires high quality studies and a careful interpretation of the resulting data based on the scientific method. In this regard, doctors have a duty and an important role to play in education and public health and the debate on vaccines.

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