

**“All manner of ills”: The features of serious diseases attributed to vaccination.
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Vaccine 2010;28:3066-70

Running Head: All manner of ills

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Declarations

Funding:

National Centre for Immunisation Research and Surveillance is supported by the Australian Government Department of Health and Ageing, the NSW Department of Health and The Children's Hospital at Westmead.

This research was undertaken independent of any of its funding sources.

Competing interests:

SC owns 450 shares in CSL Ltd.

JL and SCCR are working in studies part-funded by Sanofi Pasteur.

Introduction

The anti-vaccination movement claim many negative consequences from vaccination. High profile controversies have promoted hypotheses that vaccines were responsible for serious and dreaded diseases or disabilities with uncertain causes. Examples include encephalopathy from the pertussis vaccine in the UK in the 1970s and, more recently in the UK, autism from the measles-mumps-rubella (MMR) vaccine and, in France, multiple sclerosis from the hepatitis B vaccine [1-3]. Previous studies have examined the content, specific claims, and appeals employed by anti-vaccination movements and websites [4-6].

Parental anxieties about fearful, mysterious diseases that threaten children foment receptive audiences for such claims. These causal attributions do not rely on the strength of evidence for asserting causal association but share a number of epidemiological and societal features in addition to the uncertain or idiopathic origin of the named diseases [4]. This analysis investigates some of the features of these diseases, in an attempt to gain further insights into the anti-vaccination movement's strategies. Part of any attempt to respond meaningfully to public scares about vaccines requires an understanding of the wider discourses in which they are embedded.

Methods

Previous research listed all explicit claims about vaccine-caused diseases made in Australian newspaper letters to the editor and quotes from anti-vaccination spokespersons [4]. Publications included all major metropolitan and suburban daily and weekly newspapers published in Australia between 1993 and 1997. We supplemented this with searches of anti-vaccination writings that might be encountered by a parent seeking information on the Internet. In Australia, 85% of Internet users use a search engine to find what they want with about half viewing the first one or two pages [7]. The search was undertaken in 2001 and updated in April 2009 to incorporate a small number of new claims that had arisen in this period. It included Internet sites located within the first 20 hits of a Google search using the words "vaccination", "immunisation", or "immunization". We also searched known anti-vaccination sites and widely quoted books and noted diseases or conditions causally and explicitly attributed to vaccination found in at least two sources (Table 1). Sites were considered anti-vaccination if the majority of their messages were devoted to alleged harms from vaccines.

The epidemiologic and societal characteristics were identified with a thematic analysis. With the list of diseases assembled, two authors discussed the shared attributes and agreed on a common list.

Results

There was general stability in the attributions made over the analysis period. The majority of the diseases attributed to vaccination from the 1993–1998 newspaper data and 2001 Internet data remained in 2009. Sudden infant death syndrome links to vaccines became less prominent. Reproductive problems from the HPV vaccine were a new claim. Five characteristics were common to them: idiopathic nature (uncertain origin); an apparent rise in incidence of the disease; face value biological plausibility of a link to vaccines; dreaded outcomes; and condition onset having close proximity to immunisation.

Idiopathic nature

“Some research has suggested that various defects in the vaccines routinely administered to newborns and small children may be contributing to the current explosion of chronic, neurological and immune system dysfunction in the American population, including asthma, lupus, rheumatoid arthritis, cancer, and AIDS.” [8]

Anti-vaccination writings tend to attribute causal connections between vaccination and diseases with idiopathic origin. Autism, asthma, multiple sclerosis, cancers, diabetes and Gulf War Syndrome have all baffled science and draw intense media interest when new claims about their origin arise. Their power comes from the suggestion that danger lurks in the familiar, with the sub-text that vaccines are modern day Trojan horses, promising prevention but disguising hidden threats.

Positioning vaccines as culprits for such diseases provides discrete causal agents that place prevention (not having a vaccine) within the reach of individuals and appeals to the human preference to face risks through omission rather than commission [9]. This reflects a broader basic need for control over risk. For example, before research into the causes of sudden infant death syndrome (SIDS) revealed sleeping position and secondhand tobacco smoke as causative factors, the vaccination-as-cause hypothesis drew public attention. Once there were practical measures to minimise the risk of SIDS, this hypothesis waned. Autism then replaced SIDS as a dreaded condition with uncertain aetiology, seemingly on the increase and capturing public attention.

Apparent rise in incidence

Along with having idiopathic origin, diseases like autism and asthma appear to have increased in incidence in recent decades. Anti-vaccinationists allege this increase coincides with more vaccination.

“Instead of epidemics of measles and polio, we have epidemics of chronic autoimmune and neurological disease. In the last 20 years rates of asthma and attention-deficit disorder have doubled, diabetes and learning disabilities have tripled, chronic arthritis now affects nearly one in five Americans and autism has increased by 300 percent or more in many states. The larger unanswered question is: To what extent has the administration of multiple doses of multiple vaccines in early childhood — when the body’s brain and immune system is developing at its most rapid rate — been a cofactor in epidemics of chronic disease?” [10]

Chronic diseases are more prevalent today, partly because of reduced child mortality and increased life span enjoyed in nations that have controlled infectious diseases through vaccination, antibiotics and sanitation. Also, conditions like autism lack concrete biochemical or clinical parameters, making them more prone to shifts in diagnostic criteria. The ongoing reappraisal of the diagnostic criteria for the autistic spectrum of disorders over recent decades has led to substantial uncertainty over whether a true increase in incidence exists or whether such diagnostic shifts represent an artifactual increase [11].

Face value biological plausibility

The connections made in anti-vaccine writings between vaccines and many diseases have an intuitive biological plausibility. As man made and immune-altering agents, vaccines might thwart the immune system in some complex and unseen fashion. Despite the lack of evidence for such an effect, this perception is understandable, first because the immune system has been increasingly seen as mediating the effect of environmental factors such as sunlight, electromagnetic radiation, chemical toxins and diet [12], and second, a growing number of diseases such as diabetes and cancer are attracting suggestions of autoimmune involvement [12].

Dreaded outcomes

Many of the ills attributed to vaccination have lethal, insidious or dreaded consequences. SIDS, autoimmune disorders and developmental disability are a few examples. Such qualitative components of dreaded diseases reduce the acceptability of even minute risks [13]. Anti-vaccine groups or individuals appear to select fearful diseases for attribution to vaccines because of the potential impact of these messages. Dreaded diseases attract news media attention thus increasing the opportunity for the amplifications of the claims. One letter to an editor of a major tabloid newspaper asserted:

“Cot death (directly linked to the DTP vaccine), brain damage, Chronic Fatigue Syndrome, MS, cancer, childhood leukaemia, polyarthritis, autism, are among a growing list of diseases whose onset is either attributable to vaccine related impairment of the auto-immune system, or are new diseases with (innocuous!) names which belie the fact that their origins are directly attributable to the policy of 'vaccination at any cost' of which our government and the drug companies have placed us in its grip.” [14]

Close proximity to immunisation

Some of the diseases most often attributed to vaccines become apparent in early childhood when many vaccines are given. In such cases, parents understandably search for an agent of blame, scouring their memories for events shortly before the illness. When parents apply *post hoc ergo propter hoc* (after therefore because of) reasoning, vaccination can become a compelling causal candidate. Reassurances exonerating vaccines are often met with dismay by those committed to their theory. For parents who may feel guilt, albeit unwarranted, about their child's problem, vaccination is a graspable external cause. The parents of Lyla Rose said of their daughter's unexplained death:

“The first instinctive reaction in such a situation is for parents to blame themselves. For many weeks, my wife and I agonized over what we might have missed or could have done differently. Meanwhile, the logical part of my brain kept returning to the obvious medical event that preceded Lyla’s death – and that internal voice kept asking the question could the Hepatitis B Vaccine that Lyla received that afternoon have killed her? Most doctors I asked scoffed at that notion and said the vaccine was perfectly safe. But I began to search around on the Internet and Medline and discovered disturbing evidence of adverse reactions to this vaccine.” [15]

Parents may seek to alleviate the distress of not knowing the cause of their child’s illness, disability or death. Attributing a disease to an easily recalled agent of blame has been identified in the psychological research as the availability heuristic [16]. Vaccination, as a ‘man made’ activity of medicine and government, can provide a target for blame which taps into existing concerns surrounding abuse of medical power and excessive government control.

Discussion

Independent panels have investigated hypothesised connections between vaccines and many of the conditions and diseases named in anti-vaccine writings. In 1994, the US Institutes of Medicine published a review of the evidence for adverse events associated with childhood vaccines. Guillain-Barré Syndrome was the only disease listed in this study to have an established causal connection [17]. Studies of possible causal associations are ongoing and will become increasingly important as vaccine risk–benefit ratios narrow and public tolerance reduces [18,19]. Significantly, some of the officially accepted potential adverse events, such as those listed in *The Australian Immunisation Handbook*, are virtually ignored in anti-vaccine writings [20]. These include, among others, anaphylaxis, hypotonic-hypo-responsive episode, parotitis, thrombocytopenia and toxic shock syndrome [20].

Our analysis suggests that attributions of harm are not so much linked to the science of the causal association but reflect societal attributes. This has been well recognised in risk perception research which has found risks are less tolerated if they are the result of human actions, are hidden, cause irreversible damage, arouse particular dread or are poorly understood by science [2,21].

The mass media constantly report new studies which link idiopathic ills with exotic or familiar technological agents, quenching the collective thirst for understanding and a corresponding possibility of control over their occurrence. Related to this is the appeal of having a discrete causal mechanism. Studies blaming specific causal agents, such as vaccines, tend to draw greater interest than those which suggest a complexity of factors because they fit media requirements for simplicity, brevity and the potential for quick fix solutions.

While public scares over the safety of vaccines have occurred since Jenner’s time, a number of changes make the current landscape more challenging [22]. These include the increasing number of vaccines being given, and the Internet and social media as a way of rapidly circulating messages. A very recent challenge is the rise of celebrity

opponents like Jenny McCarthy who give new prominence to anti-vaccine messages. Vaccine scares are also amplified in an environment of social anxiety about technological change introduced through the process of modernisation [23]. A legacy of distrust can arise from poorly handled health risk issues making it harder for governments to generate trust. Finally, there lies a tension between a marketisation approach of consumer sovereignty in health care and the traditional top-down policy approach of mass immunisation [24]. Despite these issues, there is too often an assumption that resistance to vaccination is a result of scientific illiteracy and public ignorance. The implied solution centres on more education and factual information. This reflects a failure to recognise both the complex and deeply embedded nature of vaccine resistance.

It is important to recognise these deeper anxieties, to name and respond to them. The response can be considered in two arenas: the public arena and the clinical encounter. In the public arena there is a need to accept and involve the public as a legitimate partner, being clear and working with the media.[25] Vaccination's goal of disease prevention must be at the forefront of counter-messages [2]. In the clinical encounter, health professionals need to address patient concerns about vaccine safety with tolerance and respect [26]. This includes a willingness to provide detailed information about the risks and benefits of vaccination and a responsiveness to patient reports of adverse events following vaccination.

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