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Harmfulness of Vaccines




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Background

According to the Centers for Disease Control and Prevention (2018) vaccines are one of the most important measures of preventative care used to protect the population from diseases and infections. Understandably, there are many concerns that are associated with vaccines. Some of these concerns include: the harmfulness of the adjuvants added to vaccines, the use of the preservative thimerosal in vaccines, the link between vaccines and sudden infant death syndrome (SIDS), and the link between vaccines and autism (Centers for Disease Control and Prevention [CDC], 2016). These concerns, coupled with a lack of knowledge, have lead numerous individuals to join the anti-vaccination movement. As a result, the vaccine compliance rates have declined. Consequently, diseases that were progressing towards eradication have begun to reemerge.

Objective

In order to increase vaccination compliance parents must be educated that vaccines being harmful is in fact a misnomer and that the benefits far outweigh the risks.

Problem Statement

Due to inaccurate media popularization and portrayal of the risks associated with vaccines, such as autism, there has been a decrease in vaccination compliance.

Research Question

Do parents of vaccine age children (birth to 12 years old) who have access to accurate educational materials that explain the safety and benefits of vaccines have an increased vaccine compliance rate than those who lack accurate education or only receive their education from anti-vaccination support groups?

PICO Breakdown

- **Population**: Parents of vaccine age children (birth to 12 years old).
- **Intervention**: Access to accurate education materials that explain the safety and benefits of vaccines.
- **Comparison**: Those who lack accurate education or only receive their education from anti-vaccination support groups.
- **Outcome**: An increased vaccine compliance rate.

Search for Evidence

This evidence-based summary is a traditional literature review based on descriptive, explanatory, qualitative, and quantitative research. The databases that were utilized to collect the five evidence based journals were Google Scholar, and PubMed Central. The search terms used were: vaccines and autism, anti-vaccination movement, safety of vaccines, and parent education and child vaccination compliance. The search was limited to English, peer reviewed articles, that were published within the past five years (2014-2019) unless an article from an earlier time attributed substantial evidence to support the claim.

Evaluation of Evidence

Article 1

Taylor, Swerdfeger, and Eslick's (2014) journal article is an example of meta-analysis. This article is a level 1 and is ranked the highest on the evidence hierarchy pyramid. This journal article utilized explanatory and quantitative research.

Taylor et al. (2014) conducted a meta-analysis that included five cohort studies that involved 1,256,407 children and five case-control studies that involved 9, 920 children. They concluded that their "meta-analysis provides no evidence of a relationship between vaccination and autism or autism spectrum disorders and as such advocate the continuation of immunisation [sic] programs according to national guidelines" (Taylor et al., 2014, p. 3628).

Article 1 - Appraisal Summary

Taylor, Swerdfeger, and Eslick's (2014) performed a meta-analysis to summarise available evidence from case-control and cohort studies on this topic (MEDLINE, PubMed, EMBASE, Google Scholar up to April, 2014). Eligible studies assessed the relationship between vaccine administration and the subsequent development of autism or autism spectrum disorders (ASD). Two reviewers extracted data on study characteristics, methods, and outcomes. The cohort data revealed no relationship between vaccination and autism.

Article 2

Ames, Glenton, and Lewin (2017) presents an example of a meta-analysis. The authors obtain information through searching various databases and combining statistical results from relevant randomized trials both published and unpublished. This article is level 1 on the evidence hierarchy and is explanitory, qualitative, and quantitative in design. The authors concludes that Lack of information leads to worry and regret about vaccination decisions among some parents. Parents want balanced information about vaccination benefits and harms. Poor communication and negative relationships with health workers also impact vaccination decisions (Ames et al., 2017). This conclusion is relevant to our topic of interest because it proves that knowledge increases vaccination compliance rate.

Article 2 – Appraisal Summary

Ames, Glenton, & Lewin, S. (2017). Is a meta-analysis that was aimed at exploring parents experiences regarding communication about childhood vaccinations and the manner in which it is communicated and how it influences their decision on childhood vaccination and vaccination compliance. The authors searched different databases and combined information from a total of thirty-eight studies which were mostly conducted in high income countries. It is not clear how the thirty-eight studies that the authors obtained their information from were conducted and the authors do not mention whether the allocation was randomized or not. The studies used in this research were conducted in different areas of the world and hence the subjects in this research were representative. It is not possible that the results of this study occurred by chance and therefore this results are applicable to our population.

Article 3

Maglione et al.'s (2014) journal article is an example of a systematic review. This article is a level 1 and is ranked the highest on the evidence hierarchy pyramid. This journal article utilized descriptive, explanatory, qualitative and quantitative research.

Maglione et al. (2014) conducted a systematic review of the evidence provided from 67 different studies. They concluded that the "Evidence was found for an association of several serious AEs with vaccines; however, these events were extremely rare: absolute risk is low" (Maglione et al., 2014, p. 334). They also concluded that the "Strength of evidence is high that MMR vaccine is not associated with the onset of autism in children; this conclusion supports findings of all previous reviews on the topic" (Maglione et al., 2014, p. 334).

Article 3 - Appraisal Summary

Maglione et al.'s (2014) study is a systematic review of literature on the safety of the vaccines recommended for the routine immunizations of children in the United States. The review search procedure was extensive with the aim of assessing potential statistical associations between vaccines and leukemia, autism and some other early childhood onset disease. Unlike RCT that specifies how individual were selected, this systematic review specified eligible studies included in the review such as controlled trials, control and self controlled series, cohort and observational studies, and the studies excluded from the review (Maglione et al., 2014, p. 334). Other methodologies applied in this review such as the search terms, databases and print resources consulted and the number of reviewers was clearly explained and documented.

There is sufficient detail of each individual study reviewed such as the description of study, follow up, results of study, effectiveness and adverse effects of vaccines. The findings of result identify minimal adverse effects associated with vaccine and no major or long effects were seen. Also, this study will ease some of the concerns that parents, health care workers, and caregivers have about the safety of vaccination.

Article 4

Uno, Uchiyama, Kurosawa, Aleksic, and Ozaki's (2015) journal article is an example of case-control study. This article is a level 4 and is ranked moderately on the evidence hierarchy pyramid. This journal article utilized explanatory and quantitative research.

This case-control study was one of the studies that was included in the Maglione et al.'s systematic review. The purpose of this study was to evaluate the correlation between the MMR vaccine and the amount of thimerosal exposure at 1, 3, 6, 12, 18, 24, and 36 months old and the risk of autism spectrum disorder (ASD) onset. Uno et al. (2015) concluded that "No convincing evidence was found in this study that MMR vaccination and increasing thimerosal dose were associated with an increased risk of ASD onset" (p. 2511).

Article 4 – Appraisal Summary

Uno et al. (2015) explored in Japanese subjects if exposure to MMR vaccine/thimerosal is related to the development of autism spectrum disorder. In order to select participants for this study, a criteria was set in place. The eligible participants had to be born between April 1986 and April 1992 which correlates to the time period when MMR was administered to children less than 3. Strengths identified included the study population consisted of individuals other than Caucasians, they used the Maternal and Child Health (MCH) handbook which is a highly reliable tool and the study was carried out using ASD diagnoses that were made with high reliability and validity. The weaknesses highlighted in this study is that they didn't examine a variety of other factors such as exposure to medications, infections, air pollution which may be related to the onset of ASD. Lack of knowledge regarding the effects of vaccines has lead to greater amounts of noncompliance.

Article 5

Rao and Andrade's (2011) journal article is an example of a traditional literature review. This article is a level 7 and is ranked the lowest on the evidence hierarchy pyramid. This journal article utilized explanatory and qualitative research.

Rao and Andrade's (2011) article explained how the unethical and falsified case series published by the former British doctor Andrew Wakefield and 12 of his colleagues in 1998 lead to a drastic decline in vaccine compliance rates (pp. 95-96). They stated that "parents across the world did not vaccinate their children out of fear of the risk of autism, thereby exposing their children to the risks of disease" (Rao & Andrade, 2011, pp. 95-96). Even though this case series had been retracted and disproved by the scientific community, it has provided the basis for popularizing the anti-vaccination movement.

Article 5 - Appraisal Summary

This study a small, uncontrolled design, which only consisted of 12 children in the sample sign. An interpretation of the original data was conducted by 10 of the 12 co-authors of the paper. According to the retraction, "no causal link was established between MMR vaccine and autism as the data were insufficient" (Uno et al., 2015). As stated, the article was then retracted and disproved.

Conclusion

The cure for ignorance is education. There are numerous public articles that provide sound evidence that supports the safety and efficacy of vaccinations. The evidence we have provided disproves the belief that vaccinations and/or thimerosal cause autism. As well as, shows proof that information to the contrary has been discredited, retracted, and disproved by the scientific community. Concerned parents and anti-vaccination proponents should be directed to review the scientific literature for themselves so they can make an informed discussion.

Conclusion

While collecting our evidence not once did we come across a research article that supported the anti-vaccination movement. This had lead us to believe that this movement is rooted in personal opinion rather than sound logic. While parents are the primary advocate for their children, it would suggest that they are allowing personal opinions of others to skew the reality of the facts. For most people perception is reality, however, that does not mean that their reality is factual. Remain wary of allowing personal opinion to be interpreted as factual information. Only when factual evidence is collected and myths and misleading information are debunked can one truly make an informed decision.

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Article 6

Hussain, Ali, Ahmed, and Hussain's (2018) journal article is an example of a traditional literature review. This article is a level 7 and is ranked the lowest on the evidence hierarchy pyramid. This journal article utilized explanatory, qualitative and quantitative research.

According to Hussain et al. (2018) "The premise of the anti-vaccination movement can also be contributed to the demonization of vaccinations by news and entertainment outlets" (e2919). As a result of the anti-vaccination movement there has been a decline in the vaccine compliance rate. According to Hussain et al. (2018) "In the UK, for example, the MMR vaccination rate dropped from 92% in 1996 to 84% in 2002. In 2003, the rate was as low as 61% in some parts of London" (e2919). In short, the anti-vaccination movement poses a true danger to the health of individuals and the collective herd immunity.