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Diphtheria-tetanus-pertussis vaccine and serious neurologic illness: an updated review of the epidemiologic evidence

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PMID: 2000268

Abstract

A widespread impression that DTP vaccine does cause brain damage has been based first on historical precedent--smallpox and rabies vaccines were recognized as sometimes causing devastating neurologic illness; analogy to pertussis--the disease can cause encephalopathy; and more recently on anecdotal evidence, particularly case series. A noncausal relationship--coincidence--could explain the temporal relation between DTP vaccine and neurologic illness, inasmuch as DTP vaccine is given at the age of emergence of idiopathic neurologic disease. The relationship between DTP vaccine and

neurologic illness lacks specificity. Case series have had an impact on both physicians' and the lay public's impression of the safety of pertussis vaccine greatly out of proportion to their scientific importance. Case series can be useful for generating hypotheses but cannot provide evidence that pertussis vaccine is causally related to acute neurologic illness or brain damage. Observational studies using cohort and ecologic designs did not find an association between DTP vaccine and serious neurologic illness, but they were not powerful enough to detect an association as rare as that observed by the NCES investigators. The case-control design offers the best chance of providing causal evidence regarding DTP vaccine and serious neurologic illness. The NCES is the only published case-control study of this issue. This study found a rare association between DTP vaccine and some types of acute neurologic illness. Bias and chance are unlikely to account entirely for the association demonstrated by the NCES. However, the association has not yet been replicated by other case-control studies. The NCES does not demonstrate that DTP vaccine causes permanent brain damage.

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