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Vaccines for preventing influenza in people with asthma (Review) Copyright © 2013 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.



[Intervention Review]

Vaccines for preventing influenza in people with asthma

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ABSTRACT

Background

Influenza vaccination is recommended for asthmatic patients in many countries as observational studies have shown that influenza infection can be associated with asthma exacerbations. However, influenza vaccination has the potential to cause wheezing and adversely affect pulmonary function. While an overview concluded that there was no clear benefit of influenza vaccination in patients with asthma, this conclusion was not based on a systematic search of the literature.

Objectives

The objective of this review was to assess the efficacy and safety of influenza vaccination in children and adults with asthma.

Search methods

We searched the Cochrane Airways Group trials register and reviewed reference lists of articles. The latest search was carried out in November 2012.

Selection criteria

We included randomised trials of influenza vaccination in children (over two years of age) and adults with asthma. We excluded studies involving people with chronic obstructive pulmonary disease.

Data collection and analysis

Inclusion criteria and assessment of trial quality were applied by two review authors independently. Data extraction was done by two review authors independently. Study authors were contacted for missing information.

Main results

Nine trials were included in the first published version of this review, and nine further trials have been included in four updates. The included studies cover a wide diversity of people, settings and types of influenza vaccination, and we pooled data from the studies that employed similar vaccines.

Protective effects of inactivated influenza vaccine during the influenza season

A single parallel-group trial, involving 696 children, was able to assess the protective effects of influenza vaccination. There was no significant reduction in the number, duration or severity of influenza-related asthma exacerbations. There was no difference in the forced expiratory volume in one second (FEV₁) although children who had been vaccinated had better symptom scores during influenza-positive weeks. Two parallel-group trials in adults did not contribute data to these outcomes due to very low levels of confirmed influenza infection.



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Adverse effects of inactivated influenza vaccine in the first two weeks following vaccination

Two cross-over trials involving 1526 adults and 712 children (over three years old) with asthma compared inactivated trivalent splitvirus influenza vaccine with a placebo injection. These trials excluded any clinically important increase in asthma exacerbations in the two weeks following influenza vaccination (risk difference 0.014; 95% confidence interval -0.010 to 0.037). However, there was significant heterogeneity between the findings of two trials involving 1104 adults in terms of asthma exacerbations in the first three days after vaccination with split-virus or surface-antigen inactivated vaccines. There was no significant difference in measures of healthcare utilisation, days off school/symptom-free days, mean lung function or medication usage.

Effects of live attenuated (intranasal) influenza vaccination

There were no significant differences found in exacerbations or measures of lung function following live attenuated cold recombinant vaccine versus placebo in two small studies on 17 adults and 48 children. There were no significant differences in asthma exacerbations found for the comparison live attenuated vaccine (intranasal) versus trivalent inactivated vaccine (intramuscular) in one study on 2229 children (over six years of age).

Authors' conclusions

Uncertainty remains about the degree of protection that vaccination affords against asthma exacerbations that are related to influenza infection. Evidence from more recently published randomised trials of inactivated split-virus influenza vaccination indicates that there is no significant increase in asthma exacerbations immediately after vaccination in adults or children over three years of age. We were unable to address concerns regarding possible increased wheezing and hospital admissions in infants given live intranasal vaccination.

PLAIN LANGUAGE SUMMARY

Vaccines for preventing flu in people with asthma

Asthma is a condition that affects the airways – the small tubes that carry air in and out of the lungs - and the symptoms are generally coughing, wheezing, shortness of breath and chest tightness. The symptoms can be occasional or persistent. When a person with asthma breathes in an asthma trigger (something that irritates their airways), the muscles around the walls of the airways tighten so that the airways become narrower and the lining of the airways becomes inflamed and starts to swell. For many people with asthma, cold and flu viruses trigger their symptoms. Therefore, getting a flu virus makes their asthma worse and having a flu jab (influenza vaccine) may protect people against some of the flu viruses that they will come into contact with in a given winter. However, the effects of a flu jab (vaccination) are not straightforward as there is also the possibility that the flu jab itself could cause a worsening of asthma. Current guidelines in the UK recommend that high-risk groups such as people with severe asthma should have a flu jab each winter (NHS Choices); however, there is limited evidence for this approach.

In this review, we evaluated evidence from randomised trials (RCTs) in relation to potential benefits and harms of all types of influenza vaccination in adults and children (over the age of two years) with asthma.

One trial in 696 children assessed the benefits of injecting inactivated influenza vaccine (inactivated virus vaccines are the type currently used in the US and UK and cannot cause flu). There were no significant differences in the number of people experiencing an asthma attack (worsening of symptoms); however, there were better symptom scores (people reporting fewer asthma symptoms) in weeks in which children had a positive test for influenza, in those who had received the jab compared to those who did not.

Two trials involved 1526 adults and 712 children who were given inactivated influenza vaccination, examined the harmful effects caused immediately after injection. These studies ruled out the likelihood of any more than four out of 100 people having a resultant asthma attack in the first two weeks after getting their flu jab. There was not enough information to compare different vaccination types.