



# Is egg hypersensitivity a contraindication to influenza vaccine?

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## The setting

I received a complaint from a patient with asthma to whom I had recommended influenza immunisation despite her 'egg allergy'. I had told her there was little evidence to support withholding this valuable intervention. She promptly went home and looked it up on the internet. She was correct of course. Both immunisation guidelines and the manufacturers of influenza vaccines list egg hypersensitivity as a contraindication to influenza vaccine administration.<sup>1,2</sup> This advice is not given for MMR vaccine which is similarly prepared in chick embryo tissue.<sup>1</sup> Is there good evidence to support this given the strong evidence supporting the value of this intervention?

## Asking the question

Using the PICO format the question can be phrased as: 'Do people with egg allergy (Patient) who have an influenza vaccination (Intervention), in comparison to those without egg allergy (Comparison), suffer more allergic and other adverse reactions (Outcome)?'

## Acquiring the evidence

I conducted a search of Medline databases from 1966 to July 2003, and the Cochrane database by MeSH terms: 'egg hypersensitivity', 'influenza vaccine' and 'adverse event(s)' (<http://www.nlm.nih.gov/mesh/meshhome.html>), and by the keywords: 'egg allergy', 'influenza immunisation'. References from identified papers were then used to identify further papers.

## Assessing the evidence

I learnt that although both MMR and influenza vaccines are produced in chick embryos, the former is produced in fibroblast tissue cultures and therefore does not contain significant amounts of egg cross-reacting proteins.<sup>3</sup> Hence, there is logic in treating the vaccines differently and biological feasibility for a vaccine reaction.

Kawahara et al<sup>4</sup> conducted an uncontrolled clinical trial of influenza vaccine on 36 subjects with a positive CAP-RAST test to egg white and/or immediate type hypersensitivity after eating egg. Only one had local swelling. They also conducted a similar trial between 104 positive CAP-RAST test to egg white and 98 negative subjects with no significant differences between the two groups.

Davies and Pepys<sup>5</sup> in a study of 70 atopic subjects found that those with a history of egg allergic reactions (n=22) had significantly more positive skin tests than those who did not. Seven of those who had a history of allergy also had positive skin tests to influenza vaccine.

James et al<sup>3</sup> conducted a multicentred, nonrandomised controlled trial on 83 children with egg allergy demonstrated on skin testing +/- oral egg challenge and 128 controls. Cases were given influenza in two doses (1/10<sup>th</sup> and 9/10<sup>th</sup>) 30 minutes apart and controls the usual statim dose. Four tested positive in the allergy group and one in the control. All received the vaccine without any significant immediate or delayed reaction.

The evidence is based on small, unblinded nonrandomised studies which are

less than gold standard and therefore cannot exclude rare and catastrophic events such as anaphylactic shock. While skin testing was more likely to be positive this was not reflected in vaccine adverse event rates and therefore is unlikely to be clinically significant. Are these results generalisable to our patients? Although, the studies were conducted in referral centres, atopic and egg sensitive patients are unlikely to differ from those we encounter in general practice.

## Applying the evidence

I was relieved from a medicolegal perspective that my advice was backed by evidence. I could then deal with the complaint by saying: 'Yes, you are correct. Such contraindications do exist but the literature supports my advice that 'there is little evidence that egg hypersensitivity leads to adverse outcomes in those receiving influenza vaccine'.

Conflict of interest: none declared.

## References

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