

INFLUENZA VACCINATION IN EGG-ALLERGIC PATIENTS: CURRENT GUIDELINES, CASE REPORT AND DISCUSSION

Talita A Ferreira-van der Watt, MBChB, FCPaeds, MMED Paeds, DCH

Claudia L Gray, MBChB, FRCPCH, MSc, DipAllergy, Dip Paed Nutrition

Michael E Levin, MBChB, FCPaeds, PhD, DipAllergy

Division of Allergy, Red Cross War Memorial Children's Hospital, University of Cape Town

Correspondence:

TA Ferreira-van der Watt, email: drtalita@gmail.com

BACKGROUND

The inactivated Influenza vaccine is manufactured via propagation of the virus in hen's egg, hence there is a potential for the vaccine to contain residual egg protein. As such, there has been much confusion about the use and safety of the influenza vaccine in egg allergic patients. Egg allergic patients are at increased risk of co-morbid atopic conditions such as asthma, which is a common indication for the influenza vaccine. This short report presents an illustrative case of a child with egg allergy requiring an influenza vaccine, and describes the latest indications and guidelines for the influenza vaccine in egg allergic patients.

CASE

Patient RJ is a 13 year old boy who attends a tertiary allergy clinic at Red Cross Children's Hospital. He has been known to the service since the age of 2 years with eczema, asthma, allergic rhinitis and food allergy to egg and cow's milk. As an infant, he had immediate mild reactions to egg and has subsequently avoided all forms of whole and baked egg. RJ has never had an Influenza vaccine.

RJ also has mild asthma and is on low dose inhaled corticosteroids. He is also on regular anti-histamine therapy and intranasal corticosteroids for his allergic rhinitis. He still has immediate mild reactions when exposed to trigger foods. RJ recently had a reaction upon an accidental exposure to a milk-containing product with which he experienced oral and pharyngeal burning and subsequent vomiting. He has not had accidental exposure to egg for over a year, but remains highly sensitised as demonstrated by the skin prick test to egg.

At a recent follow-up appointment we decided to immunise

him with the yearly Influenza vaccine. At our facility the Vaxigrip, Lot nr K7381-2, manufactured by Sanofi Pasteur SA is being used. Vaxigrip is a purified, inactivated, split virion vaccine containing 3 strains of the influenza virus in a buffered saline solution. Vaxigrip does not contain more than 0.05 mcg ovalbumin per 0.5 ml dose.

As per previous guidelines on influenza vaccination in egg allergic children, he was initially given a 10th of the regular dose as a "tester" dose, after which the plan was to observe him for 30 minutes before giving the rest of the vaccine. Patient RJ started experiencing discomfort and pruritus in his throat 10 minutes after the tester dose and after 20 minutes was nauseous and stood gagging over a sink. After a further 5 minutes he was not feeling better and we decided to give him an oral dose of anti-histamine and not proceed with the rest of the immunisation in view of symptoms of a mild allergic reaction. He did not develop urticaria, angioedema or respiratory signs during the reaction. One week later patient RJ visited our clinic again and we performed skin prick tests to the Vaxigrip K7381-2 vaccine.

Table I: Special investigations

Skin prick tests

	2004	2012	2013
Egg white extract	10mm	5mm	9mm
Fresh egg			16mm

Table II: Skin prick test to Vaxigrip influenza vaccine

Histamine	5mm
Vaxigrip	0mm
Negative control	0mm

DISCUSSION

Inactivated Influenza Vaccine (IIV) is manufactured via propagation of the virus in egg and therefore may contain residual egg protein, which can potentially induce immediate hypersensitivity reactions in subjects with egg allergy.^{1,2} Whilst there have been no published reports of anaphylaxis to influenza vaccine, mild reactions have occurred. There is no established safe threshold for ovalbumin content in vaccines, though vaccines containing up to 0.7 mcg ovalbumin per 0.5 ml vaccine have been tolerated.¹

In general, the risk of not vaccinating outweighs that of vaccinating an egg allergic patient with the influenza vaccine. It was previously recommended that caution should be taken when administering influenza vaccine to individuals with egg allergy. Previous recommendations included administering the vaccine in 2-step graded dose challenges with 10% of the dose, an observation period and then the other 90%, as was the plan for our patient.² However, because of the paucity of reactions to the influenza vaccine, and the extremely low content of ovalbumin in modern influenza vaccines, international recommendations for the 2013/2014 influenza season have relaxed some of the previous vaccine precautions with egg-allergic patients.¹

The National Institute of Communicable Diseases (NICD) in South Africa recommends that all the following groups receive the influenza vaccine³:

- All individuals with underlying medical conditions that could lead to increased risk of influenza infection and its complications and receive regular medical care for these chronic disorders.
- All pregnant women.
- Persons admitted/residing in chronic care facilities and old age homes.
- Children on chronic aspirin therapy.
- Medical staff caring for high risk patients.
- Families of high risk patients.
- All individuals 65 years and above.
- Any person who wants to protect him/herself from infection. Contra-indications to the vaccine, as per the South African NICD, include a previous severe

(anaphylactic) hypersensitivity reaction to egg.³ However, the Advisory Committee on Immunization Practices (ACIP) in the USA, who publish their recommendations via the Centres for Disease Control, have suggested that all patients with egg allergy should be able to receive injectable influenza vaccine.¹

The ACIP have recommended the following for the 2013-2014 influenza season¹:

- Persons with egg allergy history who only experience urticaria after egg exposure should receive influenza vaccine without additional safety measures.
- Egg culture based vaccines (IIV) should be given with additional safety measures in cases where more severe reactions have occurred (administration by health care professional who is familiar with potential manifestations of egg allergy and the recipient should be observed for 30 minutes after administration).
- Persons with history of severe reaction to egg should be referred to a physician with expertise in management of allergic conditions for further risk assessment before receipt of the influenza vaccine.
- Administering the vaccine in a two-step approach is not necessary.
- Skin prick testing with the vaccine is not necessary.
- Egg allergy should be confirmed by medical history as well as special investigations for specific IgE to egg protein.
- The influenza vaccine is contraindicated in individuals with previous severe allergic reaction upon receiving the vaccine.

Skin prick testing with the influenza vaccine does not reliably identify individuals at increased risk of adverse reaction to the vaccine due to egg allergy.¹

The Joint Task Force on Practise Parameters recommend that for IIV the guidelines and package information should exclude the language that egg-allergic patients are at increased risk of allergic reaction compared to those not allergic to egg.⁴

CONCLUSION

Although the new guidelines for influenza vaccine in egg-allergic patients have relaxed, to a large extent, in comparison to previous guidelines, cases such as that of RJ above remind us that reactions to the influenza vaccine may occur. We advocate that all patients with egg allergy who receive the influenza vaccine should be observed for at least 30 minutes after their vaccine, and that antihistamines and adrenaline should be routinely available in all settings where vaccinations are administered. We concur that patients with a previous mild reaction to egg can be vaccinated in a routine vaccination clinic, but advocate that all patients with previous anaphylaxis to egg, in whom the

influenza vaccine is indicated, should be vaccinated in a specialist setting.

DECLARATION OF CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Grohskopf LA, Shay DK, Shimabukuro TT, Sokolow LZ, Keitel WA, Bresee JS, et al. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2013–2014. *Morb Mortal Weekly Rep* 2013;62:1–43.
2. Greenhawt MJ, Li JT, Bernstein DI, Blessing-Moore J, Cox L, Khan D, et al. Administering influenza vaccine to egg allergic recipients: a focused practice parameter update. *Annals of Allergy, Asthma & Immunology* 2011;106(1):11–16.
3. National Institute of Communicable Diseases. Influenza 2014: Recommendations Pertaining To The Use Of Viral Vaccines. 2014 February [cited 2014 April 6]. Available from: <http://www.nicd.ac.za/?page=alerts&id=5&rid=297>
4. Kelso JM, Greenhawt MJ, Li JT. Update on influenza vaccination of egg allergic patients. *Annals of Allergy, Asthma & Immunology* 2013;10;111(4):301–302.

Feeling a bit cramped...



***We have 60m² of office space for you.
Excellent rates. Ample parking.
Ideally situated in Mowbray.
Perfect for sales force 'hot desking'***

ALLSA Building, Waverley Court, 7 Kotzee Road, Mowbray

Contact - Professor Robin Green, email: Robin.Green@up.ac.za