

The 2009–2010 H1N1 vaccination campaign for patients with egg allergy in a region of France

A. Siret-Alatrissa, F. Bouali, M. Demoly, P. J. Bousquet & P. Demoly*

Keywords: egg allergy; influenza H1N1 vaccine; protocol.

During the French influenza A (H1N1) epidemic (October 2009 to February 2010), vaccination was recommended to the general

population. Because of the risk of adverse reactions, our service was appointed as the referral center for persons with egg allergy living in the Languedoc-Roussillon region (2.7 million inhabitants).

We describe our experience of the influenza H1N1 vaccination in patients with egg allergy. All patients tolerated the vaccination in a simple or double-dose protocol without any significant allergic reaction in this series.

To evaluate their allergy status before vaccination, a specific protocol was followed (Fig 1): the type of initial reaction to egg was evaluated by skin testing with commercial and fresh egg extracts (white, yolk, raw and heated) and by specific IgE (egg white, egg yolk, ovalbumin and ovomucoid). Finally, skin prick tests with the ovalbumin-containing vaccine were performed.

Three different vaccines were available: Celvapan® (Baxter AG, Vienna, Austria) (egg-free vaccine), Panenza® (Sanofi Pasteur, Lyon, France) and Pandemrix® (GlaxoSmithKline Biologicals s.a. Rixensart, Belgium) (derived from egg embryo tissue). The main criteria regarding the choice of vaccine included the type of primary reaction and the allergy test results. Those who presented with severe reactions after egg ingestion and positive skin prick tests or specific IgE received Celvapan®. The others were vaccinated with Panenza® or Pandemrix® depending on their age. Subjects with a positive vaccine prick test received the vaccine in two doses (one fifth and four fifths), 30 min apart.

Patients needing a second dose of vaccine were referred to the peripheral centers of vaccination. They were contacted by telephone a few weeks later to

assess the compliance for the second dose and to enquire about possible adverse reactions.

One hundred and seven subjects, aged 8 months to 76 years (mean 5 years), 57 men, 50 women, were evaluated (Table 1). Thirty-nine (37.5%) patients had initiated an egg avoidance regime because of positive skin prick tests and/or specific IgE, and 40 (38.5%) had developed an allergic reaction after egg ingestion. Among these, isolated urticaria +/- angioedema was present in 57.5% ($n = 23$), and 14.7% had isolated gastrointestinal symptoms ($n = 14$). Fifteen patients had had two or more associated symptoms, among which six had developed bronchospasm.

Skin tests with the commercial extracts were positive to whole egg (45; 47.4%), egg white (42; 44.7%) and egg yolk (32; 34%). Fifty-one (54.8%) were positive to fresh raw egg white, 29

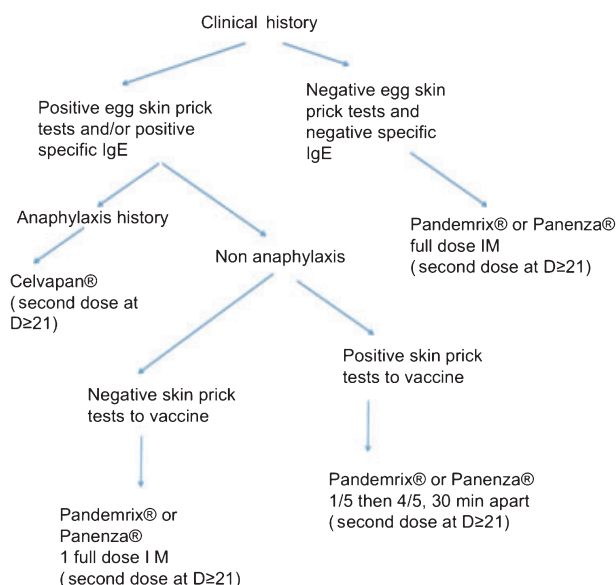


Figure 1 Protocol of vaccination.

Table 1 Descriptive table of egg-allergy population

	Skin test + and/or IgE + (<i>n</i> = 72)	Skin test – and IgE – (<i>n</i> = 35)	Total
Age	4 (2–7)	10 (4–50)	5 (2–13)
Sex (%)			
Men	43 (40.2)	14 (13.1)	57 (53.3)
Women	29 (27.1)	21 (19.6)	50 (46.7)
Cause of avoidance (%)			
After reaction	30 (28.9)	10 (9.6)	40 (38.5)
After + skin prick test or IgE	30 (28.9)	9 (8.7)	39 (37.5)
Other cause	7 (6.7)	3 (2.9)	10 (9.6)
Type of avoidance (%)			
Strict avoidance	27 (25.2)	2 (1.9)	29 (27.1)
Non strict avoidance	41 (38.3)	26 (24.3)	67 (62.6)
Medical background (%)			
Asthma	43 (42.2)	19 (18.6)	62 (60.8)
Rhinitis	29 (28.4)	18 (17.7)	47 (46.1)
Eczema	47 (46.1)	19 (18.6)	66 (64.7)
Clinical manifestation (%)			
Urticaria	16 (16.8)	3 (3.2)	19 (20.0)
Angioedema	15 (15.8)	3 (3.2)	18 (19.0)
Eczema	17 (17.9)	4 (4.2)	21 (22.1)
Gastric symptoms	10 (10.5)	4 (4.2)	14 (14.7)
Anaphylactic shock	3 (3.2)	1 (1.1)	4 (4.2)
Skin prick tests (%)			
Prick tests with commercial extracts			
Whole egg	45 (47.4)	0 (0)	45 (47.4)
Egg white	42 (44.7)	0 (0)	42 (44.7)
Egg yolk	32 (34.0)	0 (0)	32 (34.0)
Prick-prick tests			
Raw egg white	51 (54.8)	0 (0)	51 (54.8)
Raw egg yolk	22 (23.7)	0 (0)	22 (23.7)
Heated egg white	29 (32.2)	0 (0)	29 (32.2)
Heated egg yolk	2 (2.4)	0 (0)	2 (2.4)
Specific IgE (%)			
Whole egg	25 (62.5)	0 (0)	25 (62.5)
Egg white	46 (64.8)	0 (0)	46 (64.8)
Egg yolk	28 (51.9)	0 (0)	28 (51.9)
Ovalbumin	24 (54.6)	0 (0)	24 (54.6)
Ovomucoid	16 (35.6)	0 (0)	16 (35.6)

(32.2%) to heated egg white, 22 (23.7%) to raw egg yolk and 2 (2.4%) to heated egg yolk. Seventy-seven patients underwent specific IgE measurement, and most subjects were positive to egg white (46, 64.8%), egg yolk (28, 51.9%) and whole egg (25, 62.5%). Thirty-five patients (33%) had both negative skin tests and specific IgE. Two patients had

positive prick tests to vaccine (one to Pandemrix® and one to Panenza®).

Finally, 25 of 40 patients received the second dose (62% of compliance) in a general vaccine administration center. None reacted to the vaccination.

Specific recommendations for administering the influenza vaccine to patients with egg allergy are based on limited

scientific data (1, 2). Studies show the safe administration of the influenza ovalbumin-containing vaccines in one or two doses when skin tests to vaccines are negative or in patients with positive skin prick tests to vaccine and positive IgE to egg white.

In our series, we administered the H1N1 vaccine containing egg protein to 53 patients who had positive specific IgE and/or positive skin prick tests to egg. Among them, 30 (57%) had experienced immediate type allergy after the ingestion of egg. Our patients received the vaccine without any serious systemic adverse reactions. Skin testing to the vaccine was not helpful in choosing the vaccine type, as there were two false-positive reactions. These results demonstrate that patients with egg allergy, even those with allergic reaction after egg ingestion (not including severe reaction), were able to receive the H1N1 vaccine safely in a simple or double-dose protocol.

No conflicts of interests.

*Allergy Department
Hôpital Arnaud de Villeneuve
University Hospital of Montpellier
34295 Montpellier Cedex 5
France
Tel.: (0033) 467336107
Fax: (0033) 467042708
E-mail: pascal.demoly@inserm.fr

Accepted for publication 7 July 2010
Allergy 2010
© 2010 John Wiley & Sons A/S
DOI: 10.1111/j.1398-9995.2010.02461.x

References

- James JM, Zeiger RS, Lester MR, Fasano MB, Gem JE, Mansfield LE et al. Safe administration of influenza vaccine to patients with egg allergy. *J Pediatr* 1998;**133**: 624–628.
- Nasser S, Brathwaite N, BSACI Standards of Care Committee. Swine flu vaccination in patients with egg allergy. *Clin Exp Allergy* 2009;**39**:1288–1290.