

Correspondence and Replies

Intranasal live-attenuated influenza vaccine (LAIV) is unlikely to cause egg-mediated allergic reactions in egg-allergic children

TO THE EDITOR:

We read with interest the recent communication by Des Roches et al in which 68 patients with egg allergy were safely vaccinated with live-attenuated influenza vaccine (LAIV).¹ A similar multicenter study funded by the Department of Health, England, which involves the administration of 1000+ doses of LAIV in egg-allergic children, is currently underway ([ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT01859039) registration NCT01859039 and NCT02111512). This study will also provide data to allow the assessment of a possible priming and/or sensitizing effect of an initial dose of LAIV on subsequent doses, both within the same season and in subsequent years.

The absence of an acute systemic reaction in their study equates to a risk of a systemic reaction to LAIV in the egg-allergic population of up to 5.3% (upper 95% confidence interval),² or a reaction in up to 1 in 20 doses administered. Clearly, more data are needed before official guidelines can recommend LAIV for use in egg-allergic children in the primary care environment.

The ovalbumin content of LAIV varies between batches^{3,4} and is typically <0.3 ng/mL (Department of Health, personal communication)—a figure significantly lower than the maximum level of ovalbumin permitted in LAIV of 1.2 microgram/mL (240 ng/dose). It is possible that the absence of a systemic reaction to LAIV in this cohort was due to a very low level of egg protein present in that particular batch of LAIV; other batches may contain higher amounts of egg protein and may be less well tolerated. To assess this risk, we determined the intranasal reaction threshold to egg protein in egg-allergic children and nonallergic controls. The study was approved by the NHS Health Research Authority (14/WM/0016).

Eight children underwent incremental challenge to increasing doses of egg protein, all of whom had a diagnosis of IgE-mediated

egg allergy on the basis of a recent clinical reaction with positive skin prick test to egg white. Four were diagnosed with egg allergy at recent in-hospital oral food challenge. Clinical responses were monitored using both subjective (Total Nasal and Ocular Symptom Score) and objective (acoustic rhinometry and peak nasal inspiratory flow [PNIF]) measures.

No child experienced symptoms at a dose of 1 µg/mL (100ng egg protein per nostril), with the children developing mild symptoms of rhinitis after exposure to 10–100 µg/mL. These thresholds corresponded to changes in nasal patency as determined by acoustic rhinometry and PNIF ([Figure 1](#)). All 8 children tolerated LAIV administration without any allergic symptoms. No nasal response was observed to intranasal challenge with egg protein in 5 non-egg-allergic control patients.

The maximum level of ovalbumin permitted in LAIV is at least 10 times greater than the amount of egg protein found to trigger local rhinitis symptoms when administered into the nasal airway of egg-allergic children. It is therefore unlikely that LAIV would be expected to trigger symptoms due to an IgE-mediated allergic reaction to egg protein.

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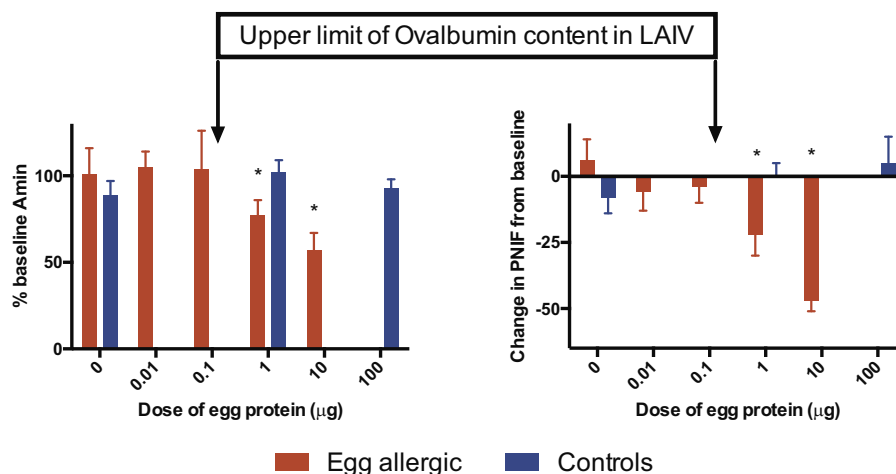


FIGURE 1. Change in nasal patency induced after intranasal challenge with egg protein, as assessed with acoustic rhinometry (*left*, minimal cross-sectional area of the nasal airway, Amin) and PNIF (*right*). * $P < .05$ compared to baseline.

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