

BRIEF REPORT

The measles, mumps, rubella, varicella vaccination was safe in children with acute egg food protein-induced enterocolitis syndrome but anxiety was high

Food protein-induced enterocolitis syndrome (FPIES) is a non-immunoglobulin E-mediated food allergy, that is characterised by repetitive vomiting within 1–4 h of eating the trigger food. It may be associated with lethargy, pallor and diarrhoea.¹ In Italy, hen's eggs are often the cause of acute FPIES.² Low amounts of hen's egg protein are found in most influenza vaccines,³ but not in clinically relevant quantities in the measles, mumps, rubella and varicella (MMRV) vaccine. The 2021 British Society for Allergy & Clinical Immunology guidelines³ recommend that children with egg allergies should receive the MMRV in primary care settings. They also state that most can receive the intramuscular influenza vaccine, unless they have had anaphylaxis after eating eggs. However, information on the safety of these vaccines has been limited to children with an immunoglobulin E-mediated egg allergy.

In 2021, Barni et al⁴ reported no systemic hypersensitivity reactions to MMRV and influenza vaccines in 33 patients with acute egg FPIES. However, they admitted that the sample size was limited, and our aim was to replicate that study and add further subjects. We carried out telephone interviews with the parents of 15 patients who had been diagnosed with acute egg/chicken FPIES¹ and referred to the allergy unit of Policlinico Gemelli University Foundation IRCCS, Italy, from February 2008 to March 2021. We asked the parents whether their child had received the MMRV and influenza vaccine, at what age and in which medical setting. Data were also gathered on whether the child had experienced any immediate or late hypersensitivity systemic reactions.

The parents provided written informed consent and the Policlinico Gemelli University Foundation Ethics Committee approved the study.

The 15 patients (8 female) comprised 12 with acute egg FPIES, 2 with acute chicken FPIES and 1 with both. Four had atypical FPIES, with a specific immunoglobulin E response against their food allergy. The median age at FPIES diagnosis was 9 months, with an interquartile range of 2 months. Two patients have not yet received the MMRV vaccine. One was 19 months of age, with atypical FPIES, and the local health unit had sought authorisation from the allergist.

The parents of the second child refused the vaccine. This meant that 13 patients received the first dose of the MMRV vaccine. All of them had active FPIES, and 3 had atypical FPIES. The median age at the time of the MMRV vaccination was 13 months, and the interquartile range was 1.5 months. Three patients received the MMRV vaccine at the allergy unit: two of them had atypical FPIES and received the vaccine about a year later than the age indicated by the vaccine schedule. None of the 13 patients had any adverse reactions to the MMRV. We found that nine had received their second MMRV dose and seven patients had received their first dose of the influenza vaccine. All of them were at least 6 years of age and their acute egg/chicken FPIES was resolved (that is the patient passed an oral food challenge with egg) for a long time. There were no adverse reactions from either vaccine.

A case series of 500 children who were affected by IgE-mediated egg allergy showed that there was no increased risk of severe allergic reactions to the MMR vaccine.³ This cannot be applied to children with acute egg FPIES, as the immunopathogenetic mechanism of this food allergy is not yet known.⁵ However, there is evidence for a systemic innate immune activation that affects the monocytes, neutrophils and eosinophils in FPIES.⁵ This means that we cannot exclude the possibility that food-responsive immune cells could react to even very small quantities of egg protein in vaccines.

Barni et al⁴ retrospectively studied 33 patients who received the MMRV vaccine at a mean age of 17.20 ± 7.63 months, before they developed acute egg FPIES and before they were able to tolerate eggs at a mean age of 28.58 ± 10.86 months. They report that 12/33 were also vaccinated against influenza after the onset of FPIES, but before they could tolerate eggs. None of the 33 patients reported any immediate or late systemic allergic reactions.

Our case series reinforced Barni et al's findings,⁴ as the MMRV vaccine was safe in our patients with acute egg/chicken FPIES, even if they were atypical. Three of the children had their vaccination after the last egg FPIES episode (see Table 1). In this regard, we would like to point out that (a) we routinely perform an oral food

TABLE 1 Age when each patient had their first acute egg/chicken FPIES episode, the MMRV and influenza vaccination and egg/chicken FPIES resolution

Age in months	First egg/chicken FPIES episode	Last egg/chicken FPIES episode	First MMRV vaccine dose	First influenza vaccination	Egg/chicken FPIES resolved
Patient 1	8	9	13	84	20
2	9	10	13	NA	NR
3	10	11	NA	NA	NR
4	10	24	15	NA	NR
5	8	86	14	168	163
6	6	20	13	52	20
7	6	8	13	NA	NR
8	9	29	13	216	63
9	9	34	NA	NA	48
10	8	79	13	108	NR
11	8	71	24	NA	NR
12	8	14	13	NA	48
13	10	36	28	NA	NR
14	5	70	13	120	NR
15	9	103	13	120	108

Abbreviations: NA, not administered; NR, not resolved.

challenge 12–18 months after the last acute episode, as suggested by the 2017 Consensus¹; (b) in our 2019 study,² we reported that tolerance for cooked egg was reached on average at 30 months of age (95% CI = 24–36). For these two reasons, we also considered the three patients to still be allergic at the time of vaccination with the first dose of MMRV. However, one-third of our families feared adverse reactions, underlining the importance of providing correct information on this subject.

CONFLICT OF INTEREST

None.

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