

Short communication

Egg allergy: An obstacle to childhood vaccination. Recommendations for vaccination practices

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ABSTRACT

Introduction: This study explores the current vaccination practices of French general practitioners regarding children with egg allergy.

Methods: An observational survey was carried out in the North of France using a questionnaire intended for volunteer general practitioners.

Results: Among 93 general practitioners surveyed, the majority (88.9 %) considered egg allergy to be problematic in case of a vaccination. The three most problematic vaccines were those against influenza, yellow fever and measles, mumps and rubella.

Discussion: Egg allergy may represent an obstacle to children vaccination. We submit recommendations for vaccination practices.

1. Introduction

Egg is one of the most common food allergens in children along with cow's milk, peanut and tree nut. Around 2 % of children under 5 years old are allergic to eggs [1]. Some vaccines are produced using an egg-based manufacturing process and contain residual ovalbumin, which is an egg allergenic protein [2]. Ovalbumin concentrations are usually higher in vaccines cultured on embryonated chicken eggs (influenza, yellow fever, and rabies vaccines) and lower for vaccines cultured on fibroblasts of chicken embryos (measles, mumps, and rubella vaccines) [2]. Egg-based vaccines have long been contraindicated in patients with egg allergy, but studies currently seem to be less alarmist [3]. Since 2018, the French law has made the vaccine against diphtheria, tetanus and poliomyelitis, pertussis, measles, mumps, rubella, hepatitis B, meningococcus C, pneumococcus and Haemophilus influenzae B compulsory for children under 2 years old. The objective of this study was to explore the vaccination practices of French general practitioners regarding children with egg allergy.

2. Methods

We conducted an observational survey using a questionnaire, which explored general practitioners' vaccination practices for children with egg allergy (Supplementary File E1). This questionnaire was established according to the method of Maisonneuve and Fournier and included 22 multiple-choice questions. The questions were approved by three general practitioners who did not take part in the study. The questionnaire was written on LimeSurvey website, which is a free online statistical survey app to develop and publish online surveys. The questionnaire link was sent to some general practitioners located in the French region of Nord-Pas-de-Calais by mail or posted on the social network Facebook on private groups of former family medicine students in Lille. Participants to the survey were volunteer and anonymous. Data were collected from September 2022 to March 2023. Statistical analysis was carried out with R software 3.6.2. Qualitative variables were described by frequency and percentage. If the expected counts were enough ($n \geq 5$), qualitative variables were compared between groups thanks to the Chi-squared test. If it was not the case ($n < 5$), Fisher's exact test was used. The p -value was set up at 0.05.

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3. Results

The questionnaire survey was completed by 93 general practitioners (Supplementary File E2). Most of them were women (63.4 %) and worked in urban areas (54.8 %). The most represented age group was the 31–40 years-old (38.7 %). Most respondents (61.4 %) rarely encountered children with egg allergy. In the event of vaccination, egg allergy was considered as a problem by most of the general practitioners (88.9 %), followed by sulfite allergy (11.1%) (Fig. 1A). Egg allergy impacted vaccination management. Regarding French compulsory vaccinations, 34 general practitioners (41 %) directly vaccinated the children with egg allergy. As many general practitioners addressed the child with egg allergy to the allergist before vaccination. Nevertheless, if the child had

food allergy other than egg allergy, 78 general practitioners (94 %) vaccinated the child directly. Regarding French recommended vaccines, 26 general practitioners (32.9 %) directly vaccinated children with egg allergy, 37 (46.8 %) addressed the child at the allergist before the vaccination. Nevertheless, if the child had food allergy other than egg allergy, 80 general practitioners (96.4 %) vaccinated the child directly. The three most problematic vaccinations for general practitioners were those against flu (54.2 %), yellow fever (36.1 %) and measles, mumps and rubella (26.6 %) (Fig. 1B). The Coronavirus disease 2019 (COVID-19) health crisis had no impact on general practitioners' vaccination practices for children with food allergy (95.2 %). Fifty-four general practitioners (65.1 %) did not carry out any special monitoring. Among the 29 general practitioners who carried out special monitoring after

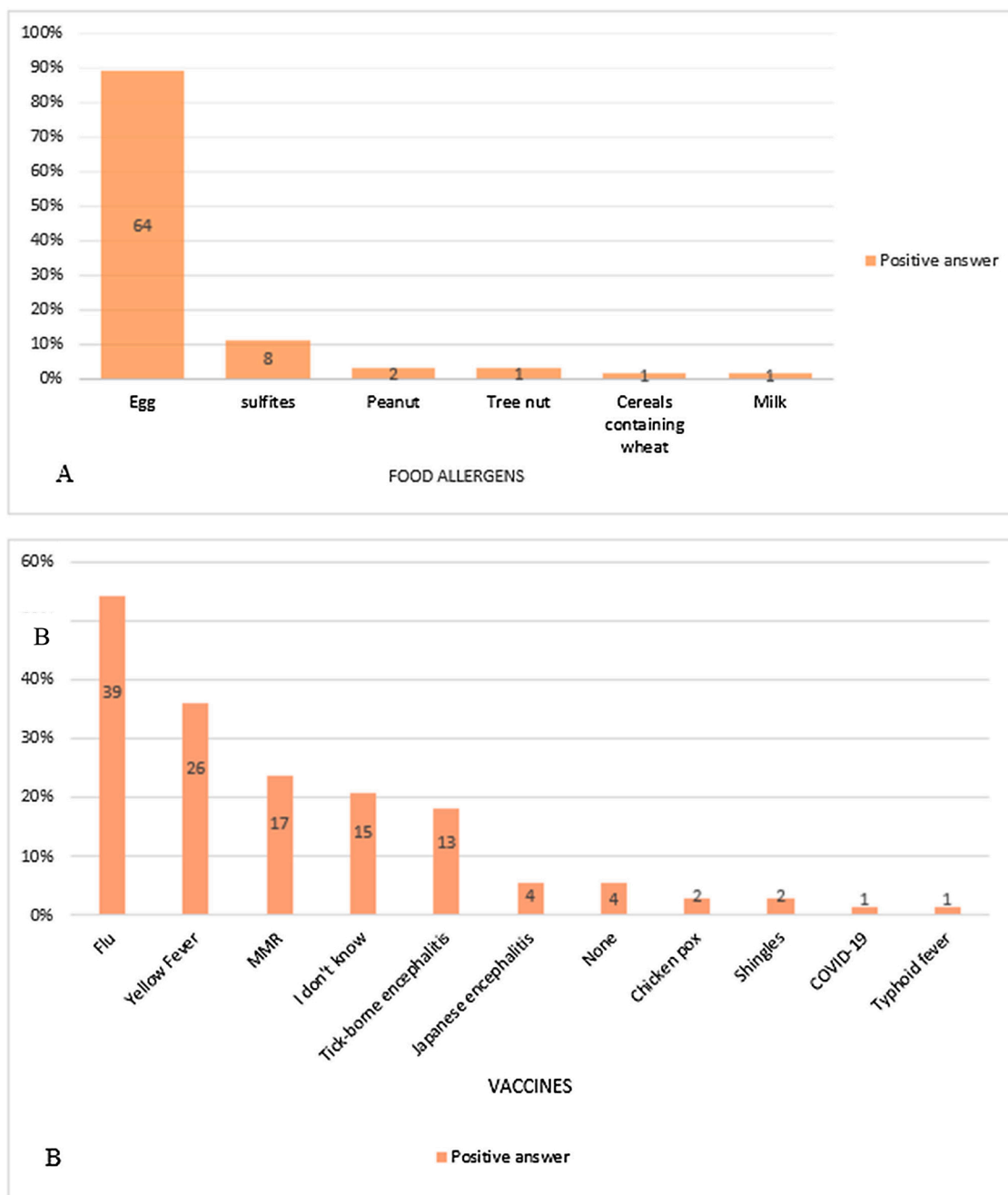


Fig. 1. Current vaccination practices of French general practitioners regarding children with egg allergy: results of a survey carried out in the North of France ($n = 93$). Problematic food allergens in the event of a vaccination according to participants in the study (A). Problematic vaccinations in case of a history of egg allergy according to participants (B).

vaccinating children with food allergy, 15 of them carried out 15-minute monitoring and five of them carried out 30-minute monitoring. In the event of an anaphylactic reaction to vaccine, 31 general practitioners (37.3 %) had adrenaline and corticosteroids at the office, 20 (24.1 %) had adrenaline and corticosteroids and antihistamines and 21 (25.3 %) had corticosteroids and antihistamines. General practitioners were not confronted or rarely confronted (71 %) with the concerns of families of children suffering from food allergy regarding the vaccination of their child. Some general practitioners (37.2 %) expressed apprehension about vaccinating children with food allergy. General practitioners who rarely or never encountered children with food allergy in their practice were naturally more apprehensive about vaccinating these children (45.9 %) compared with those who sometimes or often encountered such children in their practice (5.9 %) ($p = 0.003$). Most general practitioners (61.4 %) felt that they were not very well informed or not at all well informed on the subject. The main source of information was specialized websites for 48 participants (63.9 %). Sixty percents of the general practitioners believed that additional information on vaccination of children with food allergy could have changed their practices. Most participants (76.1 %) would be interested in additional information in the form of a website.

4. Discussion

This study suggests that children with egg allergy in France may still be delayed in vaccination, or even not be vaccinated. This trend has already been highlighted in other countries. For instance, some Polish children with egg allergy were 1–2 years late in their measles, mumps and rubella vaccination in 2019 while the country was facing an epidemic [4]. In 2020, Turkish general practitioners were used to avoid vaccine administration in the presence of food allergies and refer children to hospital [5]. However, allergy testing is no longer required in children with egg allergy, regardless of allergy severity, prior to receiving influenza, yellow fever, and measles, mumps and rubella vaccines [6–9]. To help general practitioners, we submit some recommendations for vaccination practices in case of egg allergy (Table 1). Anyway, patients who have experienced an anaphylactic reaction to vaccines should be evaluated by an allergist.

Author contributions

JC, AG, HD: writing – initial draft; PRB, AH, FL, CDS: writing – review and editing.

Participant consent

Participants gave their consent to this study.

Internal review board approval

The survey was declared under the number 2022-174 at the University of Lille and was approved by the French Data Protection Authority.

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Declaration of competing interest

The authors declare that they have no competing interests.

Table 1

Recommendations for vaccination practices in case of egg allergy (valid as of the date of publication).

Disease	Vaccines available in France in 2025 or likely to contain egg or chicken protein (data from the website mesvaccins.net)	Recommendations	References
Measles, mumps and rubella	Priorix (GSK Vaccines), M-M-R Vaxpro (MSD)	Vaccination, routine monitoring	[4,9]
Seasonal flu	Vaccination campaign 2025–2026: Vaxigrip (Sanofi Pasteur), Influvac (Mylan Medical SAS), Flucelvax Trivalent (Seqirus)	Vaccination, routine monitoring	[3,6]
	Vaccination campaign 2024–2025: Influvac Tetra (Viatris), Fluarix Tetra (GSK Vaccines), Vaxigrip Tetra (Sanofi Pasteur)	Vaccination, routine monitoring	[3,6]
Yellow fever	Stamaril (Sanofi Pasteur)	Vaccination, 60-min monitoring	[7,8]
Rabies	Rabipur (Bavarian Nordic A/S)	Avoid Rabipur Prefer Vaccin rabique (Sanofi Pasteur) without egg or chicken protein	No data
Tick-borne encephalitis	Ticovac (Pfizer), Encepur (Bavarian Nordic A/S)	Visit an allergist, vaccination at the hospital	No data

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.jahd.2025.100045>.

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