

EDITORIAL

Charting a research agenda for understanding the epidemiology of food allergy in adults in Europe

DOI:10.1111/all.12434

Anecdotal evidence suggests that the prevalence of adult food allergy is becoming more common, with up to 1 in 25 adults estimated to report being allergic to at least one food (1, 2). There is now a growing appreciation that this is the result of a combination of persistent childhood food allergy and, in some cases, new onset of the disease in adult life (3–5). Our recent systematic review on the epidemiology of food allergy in Europe, which was commissioned by the European Academy of Allergy and Clinical Immunology (EAACI) to provide a synthesis of the epidemiological evidence in order to inform the formulation of key clinical recommendations for the forthcoming *Food Allergy and Anaphylaxis Guidelines*, has clearly demonstrated the paucity of available epidemiological evidence in relation to the adult population (6, 7). It is important that this major data gap is now filled as this limits the opportunity for meaningful, data informed, policy deliberations on, amongst other things, resource allocation and service planning; more proximally, this absence of data can in some cases impair clinical decision-making, particularly regarding treatment choices and prognostication. In this editorial, we highlight some key strategic considerations in relation to advancing work on the epidemiology of adult food allergy in Europe and suggest priorities to advance future research work in this area.

A key question on the epidemiology of adult food allergy concerns the issue of definition (8, 9). In formulating a research agenda for understanding the epidemiology of adult food allergy in Europe, a starting point will be first to agree on a standardized definition of the disease. This is important because a clear and harmonized definition of food allergy will not only provide an appropriate platform for the employment of common assessment tools for epidemiological purposes, but it will also enhance estimation of the actual incidence, prevalence, natural history and overall disease burden posed by adult food allergy; this will also support direct comparison of the estimates of disease frequency and burden across different parts of Europe (8, 9). In this respect, we strongly recommend that the definitions formulated by the EAACI Nomenclature Task Force (8) be more proactively adopted in future research. Although this expert-recommended nomenclature is clinically orientated, it serves as a well-regarded common starting point. In addition to its adoption, we also advocate the approach employed in our recent systematic review (6, 7) and more generally in the asthma literature, whereby the assessment of adult food allergy should be undertaken, as much as possible, by seeking to generate estimates on the incidence and prevalence of: (i) self-reported food allergy, (ii) sensitization to food allergens

using skin prick tests and/or prick-prick tests and/or approaches to detecting raised levels of specific immunoglobulin E (sIgE) to food allergens, (iii) physician-diagnosed food allergy (with confirmatory tests) and (iv) finally the gold standard of oral food challenge-confirmed diagnosis.

It is also important that steps are taken to initiate large, longitudinal, population-based, multinational epidemiological studies that will allow the estimation of the incidence, prevalence, phenotypes, time trends and overall healthcare and social burden of adult food allergy to be reliably assessed. Such large-scale prospective evaluations should ideally draw on the expertise of and involve the concerted efforts of allergists, epidemiologists, genetic epidemiologists, statisticians, health economists and healthcare services researchers. Setting up such new large-scale primary studies will require extensive resources, manpower, time and costs, but this is essential if we are to generate reliable and comprehensive disease estimates, particularly in the many countries where there are no universal health coverage and limited opportunities to link digitized data across the life course. The extensive healthcare data sets available in, for example, the UK and the national registers available in Nordic countries provide valuable preliminary data sources for such investigations. These routinely collected secondary data have for several decades served as important resources for studying the epidemiology of several chronic diseases (10–12) and thus can play an important role in filling some of the food allergy-related data gaps in some parts of Europe. Although the issue of validity remains a major concern for routine collected secondary data, especially given that the databases might have been developed for purposes other than studying food allergy (13), this can, to varying degrees, be overcome through well-planned data linkages and triangulation.

Using these secondary data sources, and with careful linkages to other ongoing efforts (e.g. the cross-sectional EuroPrevall project) (14, 15), a prospective European-wide 'observatory' of adult food allergy can be created, which will be able to provide real-time data on the frequency and disease burden of adult food allergy. Setting up such an observatory, which would ideally be accompanied by a centralized data repository, should naturally be preceded by clear commitments by researchers to sharing their respective data sets, which would then facilitate core data pooling and meta-analyses, ideally at the individual patient level. Much of the collaborative groundwork laid by EuroPrevall survey will serve as an important foundation in this respect (14, 15).

The above epidemiological efforts need to be complemented in parallel with mechanistic work that aims to

understand the potential immunological mechanisms for the development of adult food allergy. This will allow clearer understanding of the potential routes of exposure (e.g. respiratory, oral, skin) and the foods that trigger adult food allergy, to identify IgE-mediated and non-IgE-mediated adult food allergy and to understand potential gene–environment interactions in the development of adult food allergy. While some mechanistic studies can be undertaken using animal models, the emerging genetic, immunological and omics biobanks across Europe can be valuable in advancing this area of inquiry. Several of these bioresources are already being made available to safe havens (e.g. by the i2b2 [www.i2b2.org], DataShield [www.datashield.org], Public Population Project in Genomics and Society [www.p3g.org]), with embedded bioinformatics technologies to enhance cross-border data sharing, high-throughput cross-data linkages and possibilities of undertaking key data analyses. These bioresources are already being employed in studies to understand the development of different diseases. Capitalizing on them in adult food allergy research will invariably provide greater opportunities to further our knowledge of the potential genetic and environmental risk factors, mechanisms and prognosis for adult food allergy.

In summary, there is a real paucity of ‘real-time’ data on the frequency, disease burden and outcomes of adult food allergy in Europe, which hampers efforts for healthcare service planning and policy deliberations. We have argued that these gaps need to be filled through initiating co-ordinated large-scale, longitudinal, Europe-wide, multidisciplinary epidemiological research projects in this respect. Using the same small-scale ad hoc investigations in this area will generate more of the same difficult to interpret data that are difficult to compare and meaningfully synthesize. It is therefore high time we changed the rules of the game towards a more collaborative research ethos. Future research initiatives will benefit therefore by building on ongoing research efforts (such as the EuroPrevall project) and by taking advantage of the various national registries and electronic health records across Europe, which should then culminate in the creation

of a prospective European-wide observatory and data repository for adult food allergy. In parallel, initiating well-designed mechanistic studies with clear hypotheses is crucial to understanding the immunological mechanisms, natural history, potential modifiable environmental and genetic risk and prognostic factors for the disease and to identify possible avenues for primary prevention. In this, emerging bioresources across Europe will play a key role in advancing this research space and EAACI is ideally positioned to lead this agenda.

Contributorship

AS and BN conceived the idea for this article, which was drafted by BN and AS and then revised in the light of critical feedback from AS and AM. All authors approved the final submitted version of the manuscript.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Funding

AS is supported by The Commonwealth Fund, a private independent foundation based in New York City. The views presented here are those of the author and not necessarily those of The Commonwealth Fund, its directors, officers or staff.

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