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Global Perceptions of Food Allergy Thresholds in 16 Countries

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ABSTRACT

Background

Food allergy is a growing global health issue that affects daily life and food purchasing habits. Quality data on the global consumer perspective of food allergy is limited, particularly about thresholds and food labeling risk. Many individuals with food allergy are counseled that small amounts of allergen can potentially cause life-threatening reactions, and to avoid foods with Precautionary Advisory Labeling (PAL). The purpose of this study was to understand attitudes of consumers about food allergy thresholds and food purchasing habits related to PAL in sixteen countries.

Methods

A questionnaire was distributed by patient support groups in 16 countries to consumers with food allergy. The questionnaire gathered opinions about food allergy thresholds and PAL purchasing habits.

Results

9,689 respondents from 16 countries completed the survey. 19% of respondents stated they would purchase a food containing their allergen if the amount present would not cause a reaction and 3% would purchase a food if the amount of allergen present would cause a mild reaction. When asked about labeling, 16% of respondents reported that they would purchase food with a “may contain” statement, 25% would purchase food labeled “may contain traces of allergen”, and 41% would purchase products labeled “manufactured in a facility that also processes allergen”.

Conclusions

Findings suggest that understanding of food allergen thresholds and precautionary allergen labelling is limited and consumers may develop their own risk assessment based on labels, which are not based on clinical validation. Improved awareness of thresholds, standardization of PAL, and clinical validation are needed globally.

Keywords:

Food Allergy, Global, Thresholds, Food Allergens, Precautionary Allergen Labeling

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Introduction

Childhood food allergy is a significant public health issue with prevalence rates as high as 10% among children in some countries.(1,2) While the quality and quantity of global data on childhood food allergy has increased in recent years, knowledge on consumer perceptions of issues affecting management is lacking.(3,4) Allergic reactions to food can vary from mild, to life-threatening. As a result, the standard recommendation is to strictly avoid the food allergen, which can be complicated when purchasing packaged food.

The food industry in most countries is required to label the presence of the most common food allergens when they are ingredients in packaged foods; however, they may voluntarily add Precautionary Allergen Labeling (PAL). These statements, such as “may contain...” or “processed in a facility that manufactures...” are unregulated and it is unknown how many products with PAL actually contain trace levels. Consumers must make their own decisions on how to interpret these PAL statements, which can lead to food restrictions that affect the daily lives and well-being of consumers and caregivers.(5,6)

A greater understanding of food allergen thresholds (the lowest amount of a food allergen that can cause an allergic reaction) is important to a variety of food allergy stakeholders.(7) In 2011, an expert panel was assembled to establish reference doses for 11 allergenic foods as part of the VITAL (Voluntary Incidental Trace Allergen Labeling) program. The doses were obtained from clinical challenges of individuals to establish an eliciting dose for each food at which only a predicted 1-3% of the population would react.(8)

This study represents the first of its kind to examine differences in perceptions about food allergen thresholds and PAL from the perspective of consumers in 16 countries across the world.

METHODS

Patient support organizations from sixteen countries (Australia, Canada, Chile, France, Germany, Ireland, Israel, Italy, Japan, Mexico, New Zealand, South Africa, Spain, Netherlands, UK, US) recruited adult participants for the population-based online survey. Most groups used their internal communication systems to recruit participants.

Subjects were invited to participate if they had a food allergy, someone in their family/household had a food allergy, or they were the caregiver of someone with a food allergy. Data was collected for a two-week period. Sample sizes ranged from 36 participants in

South Africa to 5,578 in the United States (Table 1). Launch dates varied across countries, with data collection occurring between February 2013 and April 2014.

The survey was based on an instrument developed by the US patient advocacy organization, Food Allergy Research & Education (FARE). The FARE survey asked questions about the influence of food labeling on purchasing habits, knowledge about thresholds, and opinions about thresholds and food choices (E1). In addition, the survey captured information about the type of food allergies, history of severe reactions, and source of food allergy diagnosis. Only minor revisions to questions were made to reflect local labelling practices in the global survey.

All participating organizations were provided the English version of the questionnaire for review before translation into their local language. The survey was completed in eight different languages (English, French, Spanish, Italian, Hebrew, Dutch, German, and Japanese).

SurveyMonkey was used to administer the online survey. Individual responses were cleaned, translated into English, and summarized by each country's patient organization. Country-level results for 9,689 participants were analyzed¹. Weighted averages of responses to each survey question were calculated. Chi-square tests of association were used to assess significant differences across countries in the primary measures of consumer perceptions.

RESULTS

Table 1 presents the characteristics of respondents to the global survey. In all but two countries (Germany and South Africa), the highest proportion of respondents reported having a child in the household with a food allergy. Respondents in New Zealand and the United States had the highest percentage of respondents reporting more than one child with a food allergy in the home (20%).

Experience with severe reactions varied considerably from only 28% of respondents in Mexico to 84% of respondents in the Netherlands (weighted average 67%). Peanut was the most common allergen reported in nine of 16 countries. The highest reported rate was 91% of respondents in the US. Five of 16 countries (Chile, 81%; Israel, 63%; Italy, 55%; Mexico, 84%; Spain, 53%) reported milk to be the most common allergen while egg was the most common

¹ A complete copy of the country-level dataset is available by request to the corresponding author.

allergen in Japan (59%) and tree nut or other nuts were most common in France (53%). In all but two countries, allergists were the most common source of food allergy diagnosis.

Knowledge of food allergy thresholds by respondents is presented in an online supplemental table (E2). The primary response variables by country are presented in Table 2. Less than one-quarter of participants in 11 of 16 countries (weighted average of 19%) reported that they would be willing to purchase foods containing their allergen if the amount would be incapable of causing an allergic reaction. Respondents in Japan were the most willing to purchase under these conditions (44%) while respondents in Italy were the least willing (14%). When asked if they would purchase foods containing their allergen if it were capable of only triggering a mild reaction, rates were lower across all countries with a weighted average of 3%. Respondents in Japan were again most willing to accept this risk of a mild reaction (15%) while respondents in Spain were least willing (1%).

Opinions about purchasing packaged foods with the precautionary label “may contain allergens” were similar. Overall, 16% of respondents reported that they would be willing to purchase such products with South Africa reporting the highest rate (53%) and the Spain reporting the lowest (6%). Slightly higher rates of participants would purchase a food labeled, “may contain traces of allergen” (25% weighted average) and the highest proportion of respondents would purchase products labeled “manufactured in a facility that also processes allergen” (41% weighted average). Significant differences by country were identified for each of the primary response variables ($p < 0.001$).

DISCUSSION

This study represents the first to explore global consumer perceptions of food allergen thresholds and food allergen labeling. Consumers would purchase food with PAL ranging from 16% “may contain allergens” and higher proportions would purchase products with other precautionary labels. Nineteen percent reported they would purchase foods that contained allergen at levels not capable of triggering a reaction, while only 3% would purchase foods that contained allergens capable of triggering a mild reaction. Consumers seem to trust these labels to estimate allergen reaction risk. This risk assessment seems to occur at different rates depending on country and the PAL statement used..

While PAL statements warn consumers of potential risk from consuming packaged foods, there are no standard regulations regarding these labels and use of PAL is voluntary. Previous

studies have shown that there is little correlation between the amount of allergen actually present in a product and the PAL statement used.(9-13) Therefore, increases in the use of PAL have escalated confusion, risk-taking, and anxiety, potentially placing severe restrictions on food choices.(11,14)

Recent research on food allergen thresholds has shown that a large majority of individuals with food allergy could tolerate small amounts of their allergen.(8,15-17) A validated labeling process would represent a much lower percentage of foods than are currently labelled with meaningless PAL statements, allowing for greater diversity of dietary choice. These policies for labeling based on thresholds would empower consumers with food allergies to make safe food purchasing choices without anxiety about complete restriction, increasing quality of life and decreasing caregiver burden.

Several limitations of the study should be noted. All data were self-reported, which is subject to bias. It is not clear if the results are reflective of the general population, as the respondents were not recruited to be representative. Often people who respond to surveys through consumer groups are skewed toward more educated, affluent, and severely affected populations. The survey's definition of severe food allergy included swelling of the tongue, lips, face, or throat, which are not always included as severe reactions. This may have inflated numbers of severe allergy.

With consumers developing their own risk assessment through the purchase of food products, it is imperative that we educate consumers with food allergy on thresholds and PAL, develop effective policies for labeling dependent on validated thresholds, and change the way physicians advise their patients about avoidance. Empowering consumers with more information from industry on the levels of allergen in packaged food may allow consumers to make decisions that are more informed and increase self-efficacy with regard to management behaviors. This could reduce fear and anxiety around consumption of packaged foods and allow consumers greater options for purchasing foods, thus improving quality of life. As the discussion on standardizing PAL and allergen thresholds continues, all stakeholders, including consumers, physicians, and food industry need to be engaged to build understanding and trust in labels based on validated allergen thresholds.

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Table 1: Characteristics of Respondents in Global Survey							
Country	Respondent with a food allergy	Adult in household with food allergy	Child in household with food allergy	2 or more children with food allergy	Anyone in household with history of severe ^a food allergy reaction	Top 3 Most Common Food Allergen	Most Common Source of Diagnosis
Australia (n=401)	15	31	89	17	68	Peanut (74%) Tree Nuts (64%) Eggs (46%)	Allergist (86%)
Canada (n=1,263)	31	48	77	10	71	Peanut (75%) Tree Nuts (62%) Eggs (26%)	Allergist (89%)
Chile (n=183)	17	34	89	16	34	Milk (81%) Soy (50%) Peanut (46%)	Digestive/GI (45%)
France (n=97)	27	40	75	14	63	Tree Nuts (53%) Peanut (52%) Eggs (42%)	Allergist (84%)
Germany (n=487)	63	68	45	7	58	Peanut (50%) Tree Nuts (49%) Milk (32%)	Allergist (69%)
Ireland (n=87)	29	43	78	13	78	Peanut (69%) Tree Nuts (66%) Eggs (44%)	Allergist (63%)
Israel (n=349)	5	21	97	12	74	Milk (63%) Peanut (39%) Tree Nuts (28%)	Allergist (86%)
Italy (n=85)	29	49	60	9	64	Milk (55%) Tree Nuts (41%) Peanut (32%)	Allergist (78%)
Japan (n=285)	31	45	73	16	56	Eggs (59%) Milk (46%) Peanut (29%)	Allergist (53%)
Mexico (n=264)	8	45	83	17	28	Milk (84%) Eggs (48%) Soy (47%)	Allergist (61%)
New Zealand (n=183)	27	38	78	20	63	Peanut (61%) Tree Nuts (56%) Eggs (52%)	Allergist (66%)
South Africa	44	56	47	19	56	Peanut (42%)	Family Physician

(n=36)						Milk (39%) Wheat (36%)	(33%)
Spain (n=577)	16	37	86	9	57	Milk (53%) Eggs (48%) Tree Nuts (43%)	Allergist (58%)
The Netherlands (n=179)	44	56	63	9	84	Tree Nuts (66%) Peanut (66%) Milk/Eggs (23%)	Allergist (69%)
UK (n=171)	41	50	55	8	80	Peanut (63%) Tree Nut (57%) Eggs (26%)	Allergist (54%)
US (n=5,578)	20	34	85	20	70	Peanut (91%) Tree Nuts (81%) Milk (43%)	Allergist (88%)
Weighted Average	24	39	81	16	67	Peanut (74%) Tree Nuts (67%) Milk (42%)	Allergist (81%)
^a Severe food allergy was described as anaphylaxis; difficulty breathing; a drop in blood pressure; swelling of the tongue, lips, face or throat; loss of consciousness; or shock							

Table 2. Respondent Opinions on Allergen Thresholds and Industry Labeling						
	Would you purchase food that contains allergen(s) ...		Would you purchase a packaged food with the label...			
	...not capable of triggering an allergic reaction?	... only capable of triggering a mild allergic reaction?	"may contain allergen"	"may contain traces of allergen"	"manufactured in a facility that also processes allergen"	
Country	% Yes	% Yes	% Yes ^a	% Yes ^a	% Yes ^a	
Australia	22	4	34	63	60	
Canada	17	3	20	27	32	
Chile	21	3	11	19	23	
France	22	2	28	56	56	
Germany	17	8	27	50	55	
Ireland	25	2	24	34	41	

Israel	39	6	28	39	63
Italy	14	2	24	39	39
Japan	44	15	35	43	72
Mexico	19	5	13	21	N/A ^b
New Zealand	31	8	44	67	76
South Africa	36	8	53	25	25
Spain	16	1	6	22	20
The Netherlands	30	10	31	53	60
UK	17	2	28	36	44
US	17	2	10	14	41
Weighted Average	19	3	16	25	41

Note: Chi-square test of association is significant at $p < 0.001$ for each column variable and country.

^a Respondents were identified as responding “yes” if they reported that they would sometimes or always buy products with this label for their family member with food allergy.

^b Respondents in Mexico did not answer this question

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