
The impact of childhood food allergy on quality of life

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Background: Food allergy affects >6% of children, but the impact of this disease on health-related quality of life has not been well studied.

Methods: Parental perceptions of physical and psychosocial functioning were measured with the Children's Health Questionnaire (CHQ-PF50). This tool and an additional allergy-related questionnaire were sent to 400 members of the Food Allergy and Anaphylaxis Network with children aged 5 to 18, an age group on which the tool has been validated.

Results: Surveys were completed by 253 parents (63%). The mean age of the food-allergic children was 10.8 years (range, 5 to 18 yrs); 59% were male. Sixty-eight percent were allergic to one or two foods, the remainder to more than two foods. Concomitant chronic atopic diseases included: asthma with atopic dermatitis (33%), atopic dermatitis alone (13%), asthma alone (33%), and 21% had neither asthma nor atopic dermatitis. In comparison to previously established norms, the families scored significantly lower (more than 10 scale score points lower and $P < 0.0001$) for general health perception (GH), emotional impact on the parent (PE), and limitation on family activities (FA). Associated atopic disease, influenced primarily by those with both asthma and atopic dermatitis, accounted for a significant reduction in the GH scale (analysis of variance, $P = 0.0001$), but not for measures of PE and FA. Within the study group, food-allergic individuals with several (more than two) food allergies had significantly lower ($P < 0.05$) scores for 7 of 12 scales compared with individuals with few (one or two) food allergies. However, those with one or two food allergies scored significantly lower ($P < 0.0001$) than established norms on scales for GH, PE, and FA.

Conclusions: Childhood food allergy has a significant impact on GH, PE, and FA. Factors that influence reductions in these scales include associated atopic disease and the number of foods being avoided.

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INTRODUCTION

Food allergy affects 6% to 8% of young children¹ and can be severe.^{2,3} Because treatments are limited to prevention of accidental ingestion and emergency management of reactions, families with food-allergic children

must live with constant vigilance and fear. The activities of daily life are potentially impacted by issues such as label reading of commercial food products, concerns for cross-contamination of foodstuffs in various settings, and exposures that may occur in school, childcare, and social activities. These issues presumably affect the quality of life for these children and their families, but this issue has not been well investigated.

The Children's Health Questionnaire (CHQ-PF50) is a generic health status tool that focuses on physical and psychosocial functioning.⁴ It was released in 1996 and has been used in several disease categories to gauge pediatric health-related quality of life

from the parent's perspective. A disease-specific quality of life measure has not been devised for food allergy; such disease-specific tools are useful in that they have increased sensitivity for disease-specific issues and are useful in outcome studies of therapies as they have been for other atopic disorders.^{5–9} However, a generic measure such as the CHQ-PF50 is useful for determining the relative burden of a disease. In this study, we used the CHQ-PF50 to determine the impact of food allergy on parental perceptions of physical and psychosocial functioning in a random sample of members in the Food Allergy and Anaphylaxis Network, a lay organization for families with food allergy.

METHODS

The CHQ-PF50 is a self-administered questionnaire that measures physical and psychosocial aspects of general health as outlined in Table 1.⁴ The CHQ-PF50 has been previously studied in a representative sample of unselected parents of children aged 5 to 18 in the United States and in parents of children with asthma, attention-deficit/hyperactivity disorder, cystic fibrosis, epilepsy, juvenile rheumatoid arthritis, and psychiatric problems.^{4,10} The instrument has demonstrated strong internal validity and consistency across these clinical groups.

The survey instrument, with an introductory letter and additional demographic questions, were distributed in a single mailing to a random sample of 400 members of the Food Allergy and Anaphylaxis Network. The instrument was standardized on parents of children age 5 to 18 years, so the mailings were directed only to families with children in this age group. To protect anonymity, the survey and demographic instrument were returned with

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Table 1. Scales Measured in the CHQ-PF50

Scale	Abbreviation	Definition
Physical functioning	PF	Limitation in physical activities, walking, sports, bathing
Role-social/emotional, behavioral	REB	Limitations in school work or social activities due to emotional or behavioral problems
Role-social/physical	RP	Limitations in school work or social activities due to physical problems
Bodily pain	BP	Intensity/frequency of pain/discomfort
General behavior	BE	Ability to get along with others, behavioral problems including aggression, delinquency, impulsivity, and social withdrawal
Mental health	MH	Negative and positive states including anxiety, depression, and positive affect
Self-esteem	SE	Satisfaction with school, athletic ability, appearance, ability to get along with others
General health	GH	Perception of overall health and illness
Parental impact-emotional	PE	Distress and worry experienced by parent or Guardian concerning child's condition
Parental impact-time	PT	Limitations in personal time experienced by parent due to child's condition
Family activities	FA	Limitations and interruption in usual family activities and family tension as a result of the child's health
Family cohesion	FC	Ability of family members to get along with one another

no identifying materials. The study was approved by the institutional review board of the Mount Sinai School of Medicine.

Statistical analysis was performed using one-way analysis of variance, unpaired *t* tests with Welch's correction for intragroup analysis, and one-sample *t* tests to compare the study sample with groups previously studied. All tests were two-tailed and significance was set at $P < 0.05$. Because 10 scaled score points represent one standard deviation, relevant differences were considered to fulfill the criteria of statistical significance with a 10-point difference in scores.

RESULTS

CHQ-PF50 questionnaires were returned by 253 (63%) of the 400 families. Of the returned forms, 93% were completed by the mother of the food-allergic child and 7% by the father. The mean age of the food-allergic children was 10.8 years (range, 5 to 18 yrs) and 150 (59%) were male. Most (96%) were under the care of an allergist and 93% had been prescribed epinephrine. In terms of co-morbid allergic disorders, 21% reported isolated food allergy, 13% indicated associated atopic dermatitis, 33% asthma, and 33% reported both asthma and atopic dermatitis in addition to the food allergies. Allergy to one food was reported by 26%, to two foods by 42%, and to

three or more foods by 32% of families. Peanut allergy was the most common reported allergy, affecting 181 children (72%). Parents visited their children's school to discuss food allergy issues with the following frequency: never/rarely (9%), once a week (9%), once a month (21%), once a year (54%), and not applicable (home school; 7%). Legal advice on issues concerning food allergy in the school setting was sought by 8% of the families.

Scores for each of 12 concepts measured by the CHQ-PF50 are shown in Table 2, along with previously reported scores for the normal US population.⁴ Scores in the food-allergic co-

hort were significantly lower for general health perception (GH), parental distress and worry (PE), and interruptions and limitations in usual family activities (FA). Interestingly, the family cohesion scale (FC) was significantly greater in the food-allergic group, although the difference was only 7.1 points. Figure 1 shows that scales for GH and PE (data unavailable for FA) were similar to those determined in a number of other chronic disorders in other studies.^{4,10}

Because children with food allergies have co-morbid conditions that could impact these scores, we analyzed the effect of asthma and atopic dermatitis on the scores (Fig 2). Only GH was

Table 2. Mean CHQ-PF50 Scale Scores for Families with Food Allergy Compared with a Sample of the US Population*

Scale	Food allergic (n = 253)	US population sample (n = 391)	P value
PF	95.7	96.1	.53
REB	92.8	92.5	.79
RP	91.3	93.6	.06
BP	79.2	81.7	.07
BE	78.3	75.6	.02
MH	75.1	78.5	.0001
SE	80.2	79.8	.75
GH	59.3†	73.0	<.0001
PE	68.1†	80.3	<.0001
PT	85.2	87.8	.04
FA	73.9†	89.7	<.0001
FC	79.3	72.3	<.0001

* Normative data from reference 4.

† Greater than 10 scale score points lower than the general population and $P < 0.05$.

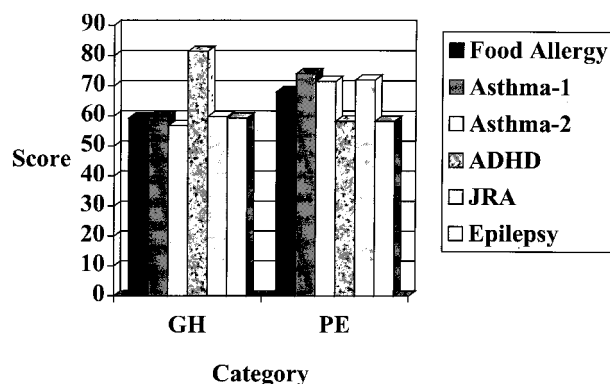


Figure 1. The scale scores for GH and PE were significantly lower than the general population (Table 2) and similar to previously studied disease groups (data from references 4 and 10, data not reported for FA in these disease groups). Asthma-1 and Asthma-2 indicate two different HMO studies; ADHD, attention deficit disorder with hyperactivity; JRA, juvenile rheumatoid arthritis.

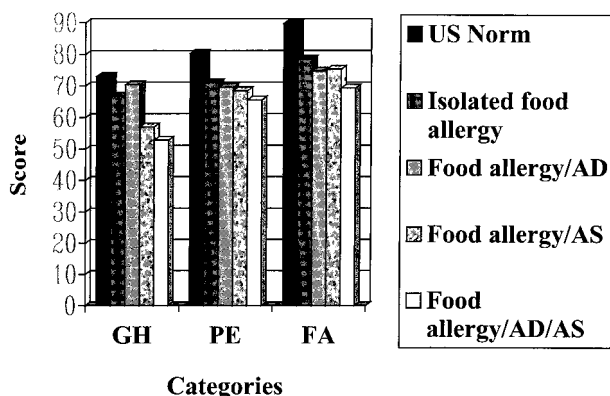


Figure 2. Although the scale scores for GH, PE, and FA were significantly reduced in the families with food allergy, only the scale for GH was significantly impacted by co-morbid conditions ($P < 0.001$). AD, atopic dermatitis; AS, asthma.

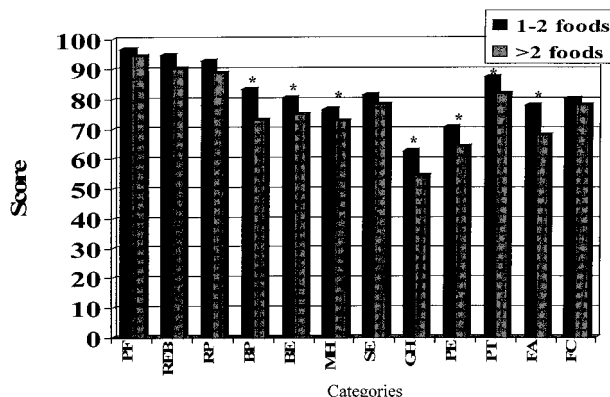


Figure 3. Seven of 12 scale scores were significantly lower ($P < 0.05$) in families with one or two food allergies compared with those with three or more food allergies. Only scores for bodily pain and FA were >10 scale points lower and significantly different.

strongly impacted by these co-morbidities ($P = 0.001$). Presumably, the number of food allergies could impact the scores; therefore, we compared families with one or two food allergies ($n = 104$) to those with three or more food allergies ($n = 149$). As illustrated in Figure 3, 7 of 12 scales were significantly lower in the families with multiple food allergies, but only perception of discomfort and FA were >10 scale points lower. There was no difference in scores comparing those with ($n = 181$) to those without ($n = 72$) peanut allergy (data not shown).

DISCUSSION

We know from previous studies that children with food allergies and their families are faced with numerous daily challenges. Accidental exposures are common¹¹ and occur both in the home and in locations such as schools,^{12,13} restaurants,¹⁴ and virtually every location where food is served.¹⁵ Families must diligently read food ingredient labels, a process with numerous pitfalls,^{16,17} and be prepared for treatment of reactions. Food allergy is the most common identifiable cause for outpatient anaphylaxis¹⁸ and can be fatal.³ These issues are a potential burden and this study shows that childhood food allergy has a significant impact on GH, PE, and FA.

There is only one other published report concerning the impact of food allergy on quality of life.¹⁹ In that study, peanut-allergic adults and parents of peanut-allergic children were compared with adults and parents of children with rheumatologic disease. The families of peanut-allergic children showed comparatively greater disruption in daily activities and impairment in family and social relations. However, the peanut-allergic adults had impairments in their quality of life that were similar to the rheumatologic patients and there was less disruption in FA. Our study confirms and extends these findings to families of children dealing with allergies to other foods. Additionally, this study shows that even for children who are otherwise well, without co-morbid atopic condi-

tions, the illness has a significant impact on FA.

Unfortunately, and not surprisingly, additional food allergies and co-morbid conditions conspire to further impact quality of life in these families. Although these co-morbid conditions negatively impact GH, there seems to be little impact upon scales such as emotional or behavioral problems, self-esteem, and FC.

A limitation of this study is that families were recruited from the Food Allergy and Anaphylaxis Network, a lay organization aimed toward support and education for families with food allergy. This sample may be biased toward a more severe allergic phenotype with a stronger impact on quality of life measures. For example, most of the families were followed by an allergist and had self-injectable epinephrine. However, the sample may have benefited from their membership and the support received for coping with the allergy, thus lessening the impact.

Until recently, there was little awareness of food allergy in the United States. Beginning with reports of fatal food-allergic reactions in the past decade^{2,20} and culminating in programs such as the Food Allergy Awareness Week in the United States and the activities of national allergy societies, the Food Allergy and Anaphylaxis Network, and others, awareness is increasing. Still, families of food allergic children face numerous obstacles as reflected by the frequency in which families in this cohort approached the schools (30% at a rate of >1 visit/month) and legal system (8%).

CONCLUSION

This study has highlighted the fact that food allergy, with or without associated conditions, significantly impacts quality of life. As such, attention must be focused on providing support for these families. Because the diagnosis

is clearly life-altering, it is crucial that it be based on solid evidence and that education and emergency preparedness be in place to provide a safe environment. Further work must be done to raise awareness in schools, camps, and restaurants and to improve processing and food ingredient labeling to maximize the number of safe foods for these families.

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