

Growth Comparison in Children with and without Food Allergies in 2 Different Demographic Populations

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Objective To examine the effects of food avoidance on the growth of children with food allergies.

Study design A retrospective chart review was performed for children with and without food allergies followed at 2 New York City general pediatric practices. Charts were selected based on codes from the *International Classification of Diseases, 9th Revision*, for well child visit, food allergy, anaphylaxis, and/or epinephrine autoinjector prescriptions. Heights and weights were obtained to calculate body mass index, height, and weight z-scores.

Results Of the 9938 children seen, 439 (4.4%) were avoiding one or more foods. Of those with commercial insurance, children with food allergies were significantly shorter (mean height z-score = 0.06; $P = .01$) and weighed less (mean weight z-score = -0.1; $P = .006$) than children without food allergies (mean height z-score = 0.42; mean weight z-score = 0.07). In contrast, children with food allergies and state insurance were not smaller in height or weight compared with children without food allergies. Among white subjects, there was a significant effect of food allergies on height and weight (ANOVA for height $P = .012$, for weight $P = .0036$) that was not observed for Hispanic/Latino, black, or Asian subjects. Children with allergies to milk weighed significantly less than children without milk allergies ($P = .0006$).

Conclusions Children with food allergies and commercial insurance have significant impairment in growth compared with those without food allergies. Additionally, children avoiding all forms of milk are shorter and weigh less than matched counterparts. Therefore, height and weight measurements should be assessed routinely in children with food allergies because there is risk for growth impairment in this population. (*J Pediatr* 2014; ■: ■-■).

The prevalence of food allergies is increasing, with 6 million children in the US affected, based on a large population-based survey study.^{1,2} Currently, strict avoidance is standard of care. Bock³ reported that 6%-8% of children develop food allergies in the first 3 years, which is a vital period of growth and development. The most common food allergens include milk, egg, wheat, peanuts, tree nuts, soy, fish, and shellfish. Several of these, particularly milk and wheat, comprise a major portion of a developing child's diet. The current recommendation to include 2 servings of whole dairy products/day (the equivalent to 300 kcal) constitutes 25%-30% of total energy needs for children 1-3 years of age (energy recommendations 1000-3000 kcal/day).⁴

Previous studies have suggested that the avoidance of cow's milk has led to inadequate nutrient intake and poor growth.⁵⁻⁷ Because of growing concerns regarding the nutritional status of children with cow's milk allergy, the World Allergy Organization published guidelines on the "Diagnosis and Rationale for Action against Cow's Milk Allergy" in 2010, which included recommendations for feeding children who are allergic to cow's milk.⁸ Additionally, the National Institute of Allergy and Infectious Diseases Food Allergy Guidelines recommend nutrition counseling and close growth monitoring for all children with food allergies.¹ Since these recommendations have been implemented, there have been no large-scale studies evaluating the growth of children on avoidance diets. We sought to assess growth in a large population of children with and without the diagnosis of food allergy.

Methods

A retrospective review of the electronic medical records of children followed at 2 general pediatric practices (identified by the *International Classification of Diseases, 9th Revision* [ICD-9] code for well child visit [v20.2]) at Mount Sinai Hospital (New York, New York) during 2010-2011 was performed. The practices are housed in adjacent buildings, staffed by the same physicians, and use the same electronic medical record. The practices differed by the primary type of insurance accepted without overlap, state insurance vs commercial insurance. Children with physician-diagnosed food allergies were identified by ICD-9 codes for food allergy (693.1), personal history of allergy to peanut (v15.01), personal history of allergy to milk product (v15.02), personal history of allergy to egg (v15.03), personal history of allergy to seafood (v15.04), personal

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history of allergy to other foods (v15.05), anaphylaxis (995), and/or epinephrine autoinjector prescription. Medical records of children with physician-diagnosed food allergies were examined for documentation of food allergen avoidance, history of food allergies, asthma, allergic rhinitis and atopic dermatitis, skin prick testing and serum food-specific IgE levels, emergency department visits for food allergic reactions, and history of anaphylaxis. Two charts of patients with food allergies were excluded after review because they had other medical conditions that affected growth (protein losing enteropathy and a genetic disorder with failure to thrive). Children without food allergy were identified by well child visit ICD-9 code, v20.2, and were included if height and weight were documented in the medical record. This study was approved by the Icahn School of Medicine at Mount Sinai Institutional Review Board with a waiver of consent.

On the basis of current recommendations, height and weight z-scores were calculated using the Centers for Disease Control and Prevention 2000 growth curves for children ages 2 and older⁹ (using the Centers for Disease Control and Prevention growth chart algorithm for SAS—SAS Version 9.3; SAS Inc, Cary, North Carolina)¹⁰ and World Health Organization growth curves for ages younger than 2 years of age.¹¹

Statistical Analyses

All statistical analyses were performed using R (version 2.15.2)¹² using the R-studio wrapper (version 0.97.449). Matched case-control subsets were created using the match controls function of the e1071 package (version 1.6-1) in R. Controls were chosen from the pool of subjects without allergies by matching them to the subjects with food allergies for age, sex, practice, and race. $P < .05$ was considered significant. Multiple group comparisons were performed with multiple linear regression or ANOVA as indicated. t tests were used to compare height and weight z-scores.

Results

Records were obtained for 9938 children attending 2 general pediatric practices that differ in the type of insurance accepted: commercial vs state insurance. Of these, 439 children (4.4%) were avoiding one or more foods because of a diagnosis of food allergies (Table I). The population was 51.5% male with no significant sex difference between children with or without food allergies (54% vs 51.4% male; $P = .32$). There was, however, a significant age difference between these groups. The median age for children without food allergies was 68 months (range, 0-240 months) as opposed to 49 months for children with food allergies (range, 0-238 months; t -test, $P < .001$). Significant racial differences were noted ($\chi^2 P = .02$). The incidence of food allergies was greater among white and black patients (5.3% and 5.2%, respectively) and lesser among Hispanic and Asian patients (3.8% and 3.7%, respectively).

Egg and milk allergies were the most prevalent at 1.5% and 0.7%, respectively; 11.6% of children with allergies to eggs and 35.2% of children with allergies to milk were including baked forms of these foods in their diets. The prevalence of milk, egg, peanut, tree nut, wheat, soy, and fish allergy peaked in the 2- to 5-year age group (1.19%, 2.42%, 3.13%, 2.33%, 0.19%, 0.38%, and 1.42%, respectively). In contrast, the prevalence of shellfish allergy increased steadily with age (3.73% in the 12- to 20-year age group). Multiple food allergies were documented for 2.23% of children, with a peak of 3.66% in children 2-5 years of age.

Influence of Food Allergy on Growth Is Dependent on Socioeconomic Status

There was no difference in body mass index between children with and without food allergies, so going forward we evaluated height and weight separately. We performed linear regression

Table I. Demographics

	All patients			Commercial insurance			State insurance		
	All, n (%)	Nonfood allergic, n (%)	Food allergic, n (%)	All, n (%)	Nonfood allergic, n (%)	Food allergic, n (% of all)	All, n (%)	Nonfood allergic, n (%)	Food allergic, n (%)
Total number	9938	9499	439	1639	1560	79	8299	7939	360
Age, y									
<2	3259 (32.8%)	3187 (33.6%)	72 (16.4%)	786 (48.0%)	764 (49%)	22 (27.8%)	2473 (29.8%)	2423 (30.5%)	50 (13.8%)
2-5	2639 (26.6%)	2487 (26.2%)	152 (34.6%)	360 (22.0%)	332 (21.3%)	28 (35.4%)	2279 (27.5%)	2155 (27.2%)	124 (34.4%)
6-11	2296 (23.1%)	2180 (22.9%)	116 (26.4%)	235 (14.3%)	216 (13.8%)	19 (24.1%)	2061 (24.8%)	1964 (24.7%)	97 (26.9%)
≥12	1744 (17.5%)	1645 (17.3%)	99 (22.6%)	258 (15.7%)	248 (15.9%)	10 (12.7%)	1486 (17.9%)	1397 (17.6%)	89 (24.7%)
Sex									
Male	5121 (51.5%)	4884 (51.4%)	237 (54%)	858 (52.3%)	819 (52.5%)	39 (49.4%)	4263 (51.4%)	4065 (51.2%)	198 (55%)
Female	4817 (48.5%)	4615 (48.6%)	202 (46%)	781 (47.7%)	741 (47.5%)	40 (50.6%)	4036 (48.6%)	3874 (48.8%)	162 (45%)
Race/ethnicity									
Black	3385 (34.1%)	3210 (33.8%)	175 (40%)	214 (13%)	205 (13.1%)	9 (11.4%)	3171 (38.2%)	3005 (37.8%)	166 (46.1%)
Asian	299 (3.0%)	288 (3%)	11 (2.5%)	131 (8.0%)	125 (8%)	6 (7.6%)	168 (2.0%)	163 (2.1%)	5 (1.4%)
White	1039 (10.5%)	984 (10.4%)	55 (12.5%)	601 (36.7%)	567 (36.3%)	34 (43.1%)	438 (5.3%)	417 (5.3%)	21 (5.8%)
Hispanic/Latino	4214 (42.4%)	4054 (42.7%)	160 (36.4%)	258 (15.7%)	247 (15.8%)	11 (13.9%)	3956 (47.7%)	3807 (47.9%)	149 (41.4%)
Other	600 (6.0%)	581 (6.1%)	19 (4.3%)	67 (4.1%)	65 (4.2%)	2 (2.5%)	533 (6.4%)	516 (6.5%)	17 (4.7%)
Unknown	401 (4.0%)	382 (4%)	19 (4.3%)	368 (22.5%)	351 (22.6%)	17 (21.5%)	33 (0.4%)	31 (0.4%)	2 (0.6%)

All children in the study subdivided by insurance and food allergy are cross-tabulated by age, sex, or race/ethnicity. Absolute numbers and percentages are shown. Percentages of all patients in an insurance category are calculated as a percentage of all patients in that category. Percentages of food allergic or nonfood allergic children are calculated as a percentage of all members of that group.

modeling for height and weight for children attending the 2 practices based on age, race, sex, practice, food allergies, and the presence of comorbid conditions including allergic rhinitis and atopic dermatitis. For height, a good fit was obtained ($P < .0001$). As expected, age, race, and sex contributed most of the variation in the model (Table II). Insurance accepted was also a significant contributor to variation in height. There was no significant multicollinearity between race and insurance. Food allergies did not contribute significantly to the model. Similar results were obtained for weight.

To control for type of insurance, we divided the dataset by practice and modeled the effect on height and weight. Analyzing heights of children on commercial insurance alone, a better fit was obtained ($P < .0001$, adjusted $R^2 = 0.94$; Table II). Food allergies were a significant determinant of height in this group ($P = .017$). The mean height z-score for children with food allergies was 0.06 ± 0.21 , whereas that of

children without food allergies was 0.42 ± 0.03 (Figure 1, A). Similarly, weight was modeled ($P < .0001$, adjusted $R^2 = 0.89$), and among children on commercial insurance, food allergies were a significant determinant of weight ($P = .002$; Table II). The mean weight z-scores of children on commercial insurance with or without food allergies were -0.1 ± 0.14 and 0.07 ± 0.03 , respectively (Figure 1, B).

A similar linear regression analysis for children with state insurance was performed ($P < .0001$, adjusted $R^2 = 0.91$). Even though food allergies were again noted to be a significant determinant of height ($P = .0045$; Table II), the mean height z-score for children with food allergies (0.50 ± 0.06) was greater than that of children without food allergies (0.46 ± 0.02) (Figure 1, A). There was no effect of food allergies on weight in this group (Table II). Mean weight z-scores were 0.54 ± 0.02 and 0.39 ± 0.06 for children with and without food allergies, respectively (Figure 1, B).

Table II. Coefficients for regression models

	Height		Weight	
	Coefficient	P value	Coefficient	P value
Model 1: all patients (n = 9938)				
Intercept	69.88	<.0001	3.99	<.0001
Age	0.55	<.0001	0.32	<.0001
Sex	1.84	<.0001	0.73	.0001
Insurance	1.23	.0006	0.22	.49
Race				
Asian	-4.38	<.0001	-1.60	.0058
White	-2.58	<.0001	-0.94	.0057
Hispanic	-1.88	<.0001	-0.56	.01
Native American	-5.82	.005	-0.52	.78
Other	-4.99	<.0001	-0.78	.07
Unknown	-0.45	.48	-1.90	.0002
Food allergy	0.61	.24	-0.49	.31
Allergic rhinitis	2.74	<.0001	0.09	.73
Atopic dermatitis	1.94	<.0001	-0.16	.71
Model 2: commercial insurance (n = 1639)				
Age	0.55	<.0001	0.30	<.0001
Sex	2.24	<.0001	1.19	.0005
Race				
Asian	-4.14	<.0001	-2.16	.0049
White	-2.05	.006	-1.83	.0008
Hispanic	-0.52	.55	-1.07	.09
Native American	-11.25	.23	-7.98	.25
Other	-2.98	.02	0.04	.96
Unknown	0.41	.61	-1.70	.004
Food allergy	2.57	.017	-2.72	.002
Allergic rhinitis	3.31	.0002	-2.05	.0016
Atopic dermatitis	3.95	.018	2.97	.016
Model 3: state insurance (n = 8299)				
Age	0.55	<.0001	0.32	<.0001
Sex	1.82	<.0001	0.66	.003
Race				
White	-4.22	<.0001	-1.81	.02
Caucasian	-2.63	<.0001	-0.38	.45
Hispanic	-2.11	<.0001	-0.51	.03
Native American	-5.87	.006	-0.15	.94
Other	-5.43	<.0001	-0.82	.08
Unknown	-3.4	.069	-0.82	.33
Food allergy	1.65	.0045	-0.13	.81
Allergic rhinitis	2.68	<.0001	0.20	.52
Atopic dermatitis	1.77	.0005	-0.33	.48

Statistically significant P values ($< .05$) are in bold.

Growth Effects of Food Allergy Are Racially Diverse

There are significant differences in the racial composition of the pediatric practices (Table I). We analyzed the effect of food allergies on height and weight in the context of self-ascribed race. For the purpose of this analysis, Native Americans and Pacific Islanders who together constituted $<0.5\%$ of the population were grouped with children whose race was described as "other." Among white subjects, children with food allergies were shorter and weighed less (ANOVA for height $P = .012$, for weight $P = .0036$). In children whose race was described as "other," children with food allergies were shorter ($P = .0019$), but no effect on weight ($P = .31$) was observed. There was no significant effect of food allergies on height or weight amongst patients with Hispanic/Latino ancestry or black, Asian, or unknown races. Insurance was noted to be an independent predictor of height and weight despite subdividing the group by race. The rates of atopic dermatitis and asthma were not different amongst the racial groups (Fisher exact test P values were .99 and .66, respectively) or between practices (Fisher exact test P values were .89 and .1, respectively).

Children with Milk Allergy Are Significantly Shorter and Weigh Less

Age, sex, race, and insurance significantly affect height. To assess the effect of individual food allergies on growth variables while controlling for these confounders, we selected a subset of children without food allergies who matched the children with food allergies on each of these variables. In this matched cohort, children who were avoiding all forms of milk were significantly shorter ($P = .047$; Figure 2, A) and weighed less compared with controls ($P = .0006$; Figure 2, B). They were also shorter than children consuming baked milk products ($P = .015$), but the weights did not differ substantially ($P = .78$). No differences were seen when we compared children with peanut, tree nut, egg, fish, shell fish, or wheat allergies with healthy control patients. Among children with food allergies with or without milk allergy, the rates of asthma

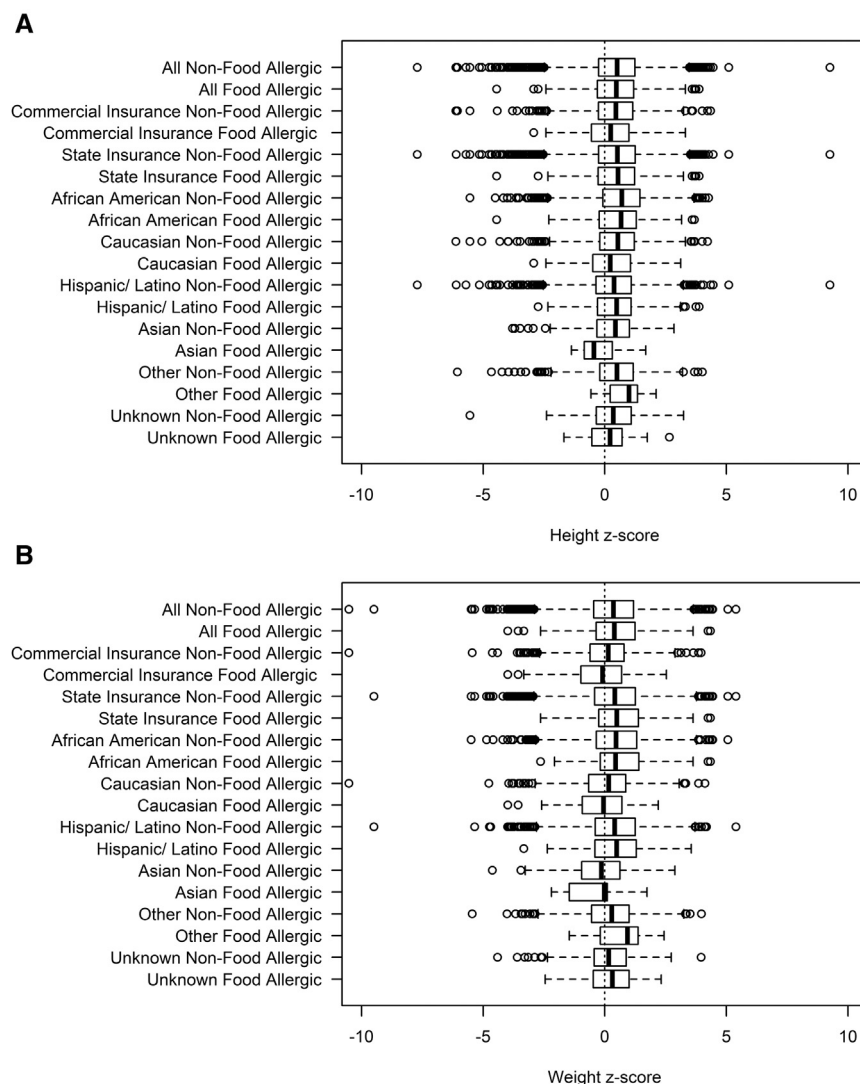


Figure 1. Boxplot showing **A**, height and **B**, weight Z-scores based on demographic group further divided by food allergy. In each box, the black line represents median, the box represents first and third quartile, and the whiskers represent the range based on 1.5 IQR. Open symbols represent outliers.

were not significantly different (Fisher exact test $P = .23$). The rates of atopic dermatitis were greater in children with milk allergies (Fisher exact test $P < .0001$). However, there was no significant difference in height in children with milk allergy with or without atopic dermatitis (t test $P = .88$).

Multiple Food Allergies Are Not Associated with Poor Growth

Multiple food allergies previously have been reported to be associated with growth retardation. We examined this in our data set and did not see any effect on height or weight of avoiding more than one food.

The Effect of Milk Allergy on Height and Weight Manifests beyond 2 Years of Age

To determine the age relationship of milk allergies, the cohort was divided into 4 groups: <2 , 2-5, 6-11, and ≥ 12 years of

age. There were too few children ≥ 12 years of age with milk allergies to perform meaningful statistical analysis. Despite its nutritional importance for the <2 -year age group, there were no significant differences in the height or weight z-scores of children with milk allergy (mean height z-score 1.03 ± 0.22 , mean weight z-score -0.34 ± 0.21) compared with children without a milk allergy in this cohort (mean height z-score 0.64 ± 0.16 , mean weight z-score -0.08 ± 0.12). However, we noted that children 2-5 years of age with milk allergy were significantly shorter and weighed less, and a similar trend towards significance was seen in the 6- to 11-year age group (Table III).

Discussion

Data from small, preselected populations have raised concerns for nutritional deficiencies and poor growth in children

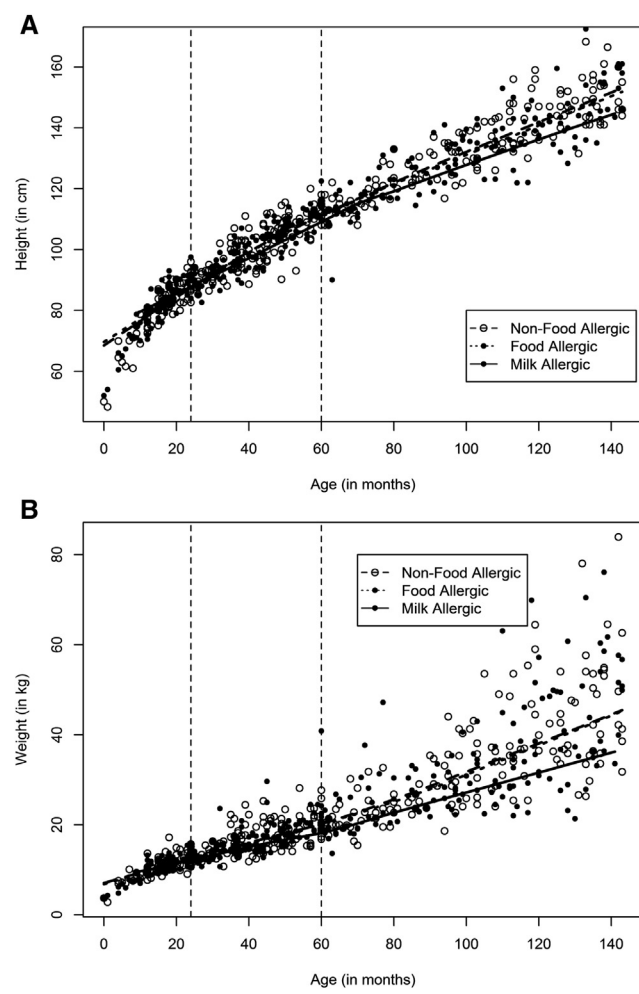


Figure 2. Scatter plot with locally weighted scatter plot smoothing (LOWESS) curves showing **A**, height (in cm) and **B**, weight (in kg) on y-axis versus age in months on x-axis for children up to 12 years of age. Children with milk allergy avoiding all forms of milk are represented by *black closed symbols and solid black line*; children allergic to foods other than milk (including those tolerating baked milk) by *grey closed symbols and dotted line* and children without allergies are represented by *gray open symbols and dashed line*. Vertical dashed lines denote 24 months (2 years) and 60 months (5 years) of age.

on elimination diets for food allergy.^{5,7,13} Thus, the aim of this study was to compare the growth of children with and without food allergies in 2 general pediatric practices. In this group of 9938 children, 439 children were avoiding one or more foods due to physician-documented food allergies. Although a difference in growth between children with and without food allergies was not seen in the overall population, a difference was found once we separated the patients by insurance: commercial vs state insurance. Patients with food allergies and commercial insurance were found to be shorter and weighed less than patients without food allergies. Similar findings were not seen in the state insured group (Figure 1). It is unclear why the growth of children

with commercial insurance is affected by food allergies whereas the growth of children with state insurance is not. Several studies have identified increased early-childhood obesity rates in low-income, minority, urban children.¹⁴⁻²⁴ Recently, obesity was shown to start early, with increased prevalence between 1 and 3 years of age in urban children in New York City.²³ These issues may be contributing to our findings because state insured children may be bigger overall. In addition, these children with food allergies may have easier access to processed foods that may be poor substitutions for the allergen(s) that they are avoiding in regards to nutritional content but may contain a high caloric value. Further studies are needed to explore the association of these factors in the growth of children with food allergies.

Consistent with previous reports,⁵⁻⁷ we found that children who were avoiding all forms of cow's milk were significantly shorter and weighed less compared with healthy control children. Furthermore, our findings suggest that the recommendations set forth in the World Health Organization guidelines "Diagnosis and Rationale for Action against Cow's Milk Allergy"⁸ and National Institute of Allergy and Infectious Diseases Food Allergy Guidelines²⁵ are being appropriately implemented because there was no growth impairment seen in children <2 years of age, a time during which milk is a major portion of the diet. We deduce that breast milk or prescribed formula for the first 2 years of life is providing adequate nutrition to prevent growth impairment. However beyond this period, there was a significant effect in children ages 2-5 and a trend toward significance in children 6-11 years of age, with children having milk allergy being smaller. We hypothesize that milk is being adequately replaced during the first 2 years of life but that older children may not have adequate substitution with alternative nutrient sources. Although reasons for this are unclear, one possibility may be that as solids become a larger portion of the diet in older children, parents/caregivers may not feel that milk substitution is as important. Furthermore, milk substitutes for this older age group are lower in fat and most are very low in protein or protein-free; thus, even when they are used, they provide a poor nutritional substitute. Parents and health care providers should be aware that additional protein and fat may be required from solid foods to meet needs in these children.

Another contributing factor to poor growth in this age group may be the exclusion of typical snack foods. Data from the Feeding Infants and Toddlers Study 2008, which randomly surveyed children ($n = 3273$) from birth through 47.9 months of age to determine food consumption patterns, indicate the intake of snack foods increases in the preschool years. Overall, 86% of 2- to 3-year-old children in this cohort consumed one or more snack/dessert foods in a day, contributing significantly to energy intake.²⁶ Children avoiding milk may be excluding many of these foods because of their milk content. The combination of poor milk substitution and the elimination of a variety of foods because of milk content in this age group may be contributing to lower energy and protein intakes.

Table III. Milk allergy with avoidance of all forms of milk adversely affects height and weight

Age group, y	Parameter	Comparator	Mean (n)		95% CI of difference between means	P value
			Nonallergic	Allergic		
<2	Height z-score	Food allergy	0.64 (71)	0.78 (72)	−0.69 to 0.41	.61
	Weight z-score	Food allergy	−0.01 (71)	−0.25 (72)	−0.16 to 0.64	.24
	Height z-score	Complete avoidance of milk	0.64 (133)	1.03 (16)	−0.93 to 0.16	.17
	Weight z-score	Complete avoidance of milk	−0.08 (133)	−0.34 (16)	−0.22 to 0.73	.29
2-5	Height z-score	Food allergy	0.68 (124)	0.59 (124)	−0.16 to 0.34	.48
	Weight z-score	Food allergy	0.51 (124)	0.53 (124)	−0.28 to 0.24	.88
	Height z-score	Complete avoidance of milk	0.69 (232)	0.11 (16)	0.05-1.12	.03*
	Weight z-score	Complete avoidance of milk	0.57 (232)	0.07 (16)	0.07-0.92	.02*
6-11	Height z-score	Food allergy	0.58 (116)	0.37 (116)	−0.06 to 0.49	.13
	Weight z-score	Food allergy	0.76 (116)	0.63 (116)	−0.18 to 0.44	.41
	Height z-score	Complete avoidance of milk	0.5 (221)	−0.09 (11)	−0.05 to 1.24	.07†
	Weight z-score	Complete avoidance of milk	0.73 (221)	0.04 (11)	−0.12 to 1.49	.09†

*Denotes statistically significant *P*-values (<.05).

†Denotes results that were not significant at a 95% CI (*P* > .05) but were significant at a 90% confidence level.

Our results also indicate that children who were avoiding all forms of milk were shorter compared with children who consumed baked milk containing foods but their weights did not differ substantially. This finding suggests that incorporating milk in baked foods may abrogate the negative impact of complete milk avoidance.

We did not have sufficient numbers of children ≥ 12 years of age who are allergic to milk to analyze their growth. Because 79% of children outgrow milk allergy by 16 years of age, we presume that most children with milk allergy will eventually reincorporate milk into the diet; however, it is unclear whether the effects of milk avoidance at an earlier age are long standing or if these children eventually catch up.²⁷

Differences in growth were not noted when we compared children avoiding egg, peanut, tree nuts, fish, or shellfish with healthy control children. Although children with allergies to wheat appeared to be numerically smaller, this finding was not statistically significant and may reflect the low prevalence of wheat allergy in our cohort (0.14%). Further study is needed to evaluate the impact of wheat avoidance on growth. Although multiple food allergies have been reported to be associated with growth deficiencies, this finding was not seen in our study, which may be because previous studies included children evaluated at tertiary allergy offices and therefore may represent a more severe atopic population whereas we evaluated a general pediatric population.^{5,6}

Limitations of this study include the retrospective design, reliance on physician diagnosis of food allergy, and lack of serum IgE, prick skin test, and oral food challenge data as well as lack of additional data that could impact growth in children. Comorbidities, medication use, nutritional supplementation (eg, vitamin D and calcium), visit to a dietitian, education regarding nutrition, and systemic symptoms indicating underlying inflammation were not obtained and can all impact growth. In addition, the ethnic composition of the practices (state vs commercial) is vastly different, and

there may be effects on growth as the result of this diversity. Studies are needed to further examine the role of these factors in growth of children with food allergies. Although we deduce that DRACMA guidelines were implemented for children 0-2 years of age, future studies are needed to assess whether these guidelines are appropriately being followed by practitioners.

The major strength of this study is the large number of subjects studied. Although previous studies have assessed growth impairment in children on avoidance diets as the result of food allergies, this represents the largest population of children to be reported. In addition, this is the first study to our knowledge that was performed evaluating the growth of children with food allergies from 2 different general pediatric populations and socioeconomic backgrounds as previous studies have been of children evaluated at tertiary care centers. As well, avoidance of all major food allergens such as milk, egg, wheat, peanut, tree nuts, fish, and shellfish were included in this study.

In conclusion, data have been lacking regarding the growth of children with food allergies, and this is the largest study examining growth in a general pediatric population. We found that children with commercial insurance who are on avoidance diets for food allergies have impairment in growth. Regardless of insurance, children >2 years who are avoiding all forms of milk are smaller in height and weight compared with matched counterparts. Our results indicate the importance of closely monitoring the growth of children with food allergies, particularly those avoiding milk. Primary care physicians should be aware of the risk of growth impairment in children with food allergies and particular attention should be paid to variables such as height and weight. Nutritional counseling should be provided to the families of these children to better educate caregivers on appropriate nutritionally dense substitutes. ■

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