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Social Disparities in Early Childhood Prevention and Management of Food Allergy

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Abstract

Food allergy (FA) affects 8% of US children. Navigating and managing FA permeates across multiple facets of childhood. In this article, we review research on social disparities in feeding practices, managing meals, and selecting childcare and schools. Key highlights include: 1) while preference for breastfeeding or formula feeding does not reduce FA risk, there are disparities in access to formula that may affect children with FA; 2) disparities likely exist in the early introduction to allergenic foods, though additional research is needed to identify barriers to following the most recent consensus guidelines on early introduction; 3) families with limited income face challenges in providing safe meals for their children; 4) disparities exist in early childcare options for preschool-aged children, though there is a lack of research on FA practices in these settings; and 5) there is evidence that schools with different student demographics implement different types of FA policies. Further research is needed to better understand and characterize social disparities in FA prevention and management in early childhood and to develop evidence-based strategies to reduce them.

Keywords

breastfeeding; child; childcare; disparities; ethnicity; food allergy; food allergy management; food allergy prevention; food insecurity; formula; infant; nutrition; race; school; social determinants of health; socioeconomic status

Introduction

Disparities in food allergy (FA) exist across multiple social domains, including race, ethnicity, and socioeconomic status (SES).^{1–5} The highest rate of increase in FA prevalence

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is among non-Hispanic Black children.³ Prospective birth cohorts indicate that children who are Black, male, and lower SES are more likely to have food sensitization or FA versus other children.^{1, 4} There are low rates of allergist referral among urban minority children with FA,⁵ and shorter duration of allergist follow-up in Black and Hispanic versus White, and Medicaid versus privately insured children with FA.⁶ Racial and ethnic disparities persist in FA oral immunotherapy clinical trial representation and in therapy awareness and access.^{7, 8} In this article, we discuss social disparities in preventing and managing FA in early childhood—a topic relevant to clinicians who treat diverse patient populations and who are key stakeholders in promoting health equity.

Feeding Practices

Infant feeding practices are deeply rooted in social and cultural norms and have important roles in FA prevention and management. Social differences in breastfeeding, formula feeding, and solid food introduction could lead to disparities in FA prevalence (Table 1).

Breastfeeding

Despite recommendations for exclusively breastfeeding for the first 4–6 months of life, only 25.6% of US children born in 2017 were exclusively breastfed through 6 months, with noted disparities by race, ethnicity, and SES.^{9, 10} Black women have the lowest breastfeeding rates likely due to factors related to interpersonal and structural racism.¹¹ While breastfeeding has positive health impacts and disparities must be addressed,¹¹ no evidence exists for reducing FA risk.¹²

Formula Feeding

When exclusive breastfeeding is not possible, formula feeding is necessary. Cow's milk allergy (CMA) is the most prevalent FA in infants.¹³ For infants with CMA unable to breastfeed, feeding with hydrolyzed or amino acid formula is medically necessary given most typical formulas are milk-based.^{12, 14} Specialty formulas are costly, though options exist to support families, including the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).¹⁵ The 2022 acute infant formula shortages, exacerbating longer-standing shortages,^{16–18} highlight the critical need for specialty formulas, which have limited or no alternatives, for children with FA.

Little is known about disparities in infant formula access. In Los Angeles county, stores in majority Black zip codes had less formula availability, variety, and accessibility versus majority White zip codes.¹⁹ Since Black infants are least likely to breastfeed and therefore most reliant on formula,^{20, 21} shortages may exacerbate disparities in formula access for already vulnerable infants.

Early Allergen Introduction

A recent FA prevention advancement is the recommendation for early allergen introduction.¹² Differences exist in timing of complementary food introduction, which could lead to disparities in FA prevalence, though findings are mixed.^{22, 23} As these studies were

performed before updated guidelines for early allergen introduction were disseminated, further research is needed to evaluate disparities in their adoption.

Food introduction timing is most strongly impacted by physician recommendation, regardless of patient race, ethnicity, and income.²³ A survey of pediatricians found the majority were aware of early introduction guidelines but few implemented them fully, citing concerns around in-clinic supervised feeding and lack of time.²⁴ What patient populations these pediatricians serve was not evaluated, but practice variations could contribute to FA disparities.

Managing Meals

Low-income families face challenges physically and financially accessing safe, allergy-friendly foods.^{25, 26} This may explain why lower-income families spend fewer dollars on FA prevention (e.g., specialty foods) and more on emergency treatment (e.g., hospital visits) compared to higher-income families.²⁷ Many low-income families rely on school meals to meet their children's nutritional needs. However, families of children with FA may forego free or reduced-price school meals out of concerns about allergen exposure, straining already limited financial resources.^{28, 29} Families may benefit from increased access to food safety net programs. Currently, few allergen-free food banks and pantries exist^{30, 31} and only 79% of eligible infants and 42% of eligible children were enrolled in WIC as of 2017.³²

Childcare and School Choices

FA is the most common cause of anaphylaxis in childcare and school settings.³³ Disparities in accessing FA-aware childcare and school options could lead to increased risk of allergic reactions or psychosocial distress for children and families.

Early Childcare

Nearly two-thirds of US children <5 years old regularly receive non-parental childcare, with 42.1% cared for by relatives and 23.5% in organized childcare.³⁴ Factors impacting families' decisions to send children to childcare include parental employment and income; childcare cost, accessibility, and quality; and comfort with FA management. Many low-income and minoritized families lack access to the full range of childcare choices due to decreased accessibility and affordability, and experience lower quality childcare.^{35, 36}

Few studies have evaluated childcare preferences for children with FA. A 2001 study found that among parents keeping their child home, 63% did so because of FA.³⁷ Sociodemographic data was not provided. A 2020 study showed that 46.9% of families with food protein-induced enterocolitis syndrome (FPIES) kept their young child home from school or daycare, 54.0% of which cited concern for FPIES.³⁸ This study consisted of primarily White, high-income families, so results may not be translatable to families with IgE-mediated FA or from socially disadvantaged groups.

Relative Care

Lower-income children are more likely to receive childcare from a relative versus organized care. Children in relative care are most often cared for by grandparents (24%).³⁴ A study of FA reactions in infants found parents (49.3%) and grandparents (7.0%) commonly provided the culprit food. Lower parental education and income were associated with increased risk of reactions.³⁹

Low health literacy is associated with poor FA management knowledge.⁴⁰ Important written materials for managing FA, including ingredient labels and epinephrine auto-injector (EAI) instructions, are typically only available in English, though Emergency Action Plans are also available in Spanish. Disparities in FA management could occur if caregivers have lower education, health literacy, or are non-English speaking.

School

A common school FA policy is restricting allergens, though there is limited evidence for effectiveness in preventing allergic reactions. A study of Massachusetts schools found only peanut-free tables were effective at reducing epinephrine administration rates.⁴¹ Schools with more restrictive policies had higher proportions of low-income and minority students versus schools without such policies. However, epinephrine administration was not associated with school racial or socioeconomic makeup.⁴² The impetus for implementing more restrictive policies in these schools is unclear, though it could be due to higher FA prevalence among specific students or limited school resources, such as financial constraints, diminished EAI availability, school nurses shortages, or lack of training—conditions inherent to socially disadvantaged schools.^{42, 43} Students with FA require access to a health management plan and EAI to treat reactions. White, high-income children are more likely to be prescribed EAIs⁴⁴ and have health management plans in place at school,⁴⁵ both of which are facilitated by having access to health insurance and healthcare. Increasing access to stock epinephrine in schools may therefore be life-saving for socially disadvantaged children with FA.^{43, 46–48}

Conclusions

Children with FA and their families face multiple challenges related to FA prevention and management across early childhood. These challenges affect health and psychosocial well-being,^{49, 50} and likely exacerbate existing disparities. Opportunities exist for improving clinical management and addressing unmet research needs (Table 2). Important initial steps can be taken by clinicians in their daily practice to recognize and remediate social disparities in FA management among vulnerable patients. Additional research is urgently needed to better understand social disparities in FA and intervene to remove them.

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Abbreviations/Acronyms:

CMA	cow's milk allergy
EAI	epinephrine auto-injector
FA	food allergy
FPIES	food protein-induced enterocolitis syndrome
SES	socioeconomic status
WIC	Women, Infants, and Children

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Table 1.
Recommendations for primary prevention of food allergies through nutrition and potential impacts on social disparities.

Consensus recommendations from the Academy of Allergy, Asthma, and Immunology (AAAAI), American College of Allergy, Asthma, and Immunology (ACAAI), and Canadian Society for Allergy and Clinical Immunology (CSACI),¹² with consideration for social disparities.

Recommendation	Strength of recommendation	Potential impact of social disparities
1. Consider infants with severe eczema at the highest risk of developing FA.	Moderate	<ul style="list-style-type: none"> • Living in an inner city associated with increased odds of atopic dermatitis.⁵¹ • Increased atopic dermatitis prevalence, severity, and persistence in Black and Hispanic compared to White children in the US.⁵²
2. Introduce peanut-containing products to all infants, irrespective of their relative risk of developing allergy, starting around 6 months of life, although not before 4 months of life.	Strong	<ul style="list-style-type: none"> • White children may be introduced to peanut earlier than non-White children.²² • Urban populations may introduce peanut earlier than suburban populations.²³
3. Introduce egg or egg-containing products to all infants, irrespective of their relative risk of developing allergy, around 6 months of life, though not before 4 months of life.	Strong	<ul style="list-style-type: none"> • No difference in timing of egg introduction by race.²² • Urban populations may introduce egg earlier than suburban populations.²³
4. Do not deliberately delay the introduction of other potentially allergenic complementary foods (cow’s milk, soy, wheat, tree nuts, sesame, fish, shellfish), once introduction of complementary foods has commenced at around 6 months of life but not before 4 months of life.	Moderate	<ul style="list-style-type: none"> • White children may be introduced to cow’s milk earlier than non-White children.²² • Urban populations may introduce fish or seafood earlier than suburban populations.²³
5. Upon introducing complementary foods, infants should be fed a diverse diet, as this may help foster prevention of food allergy.	Weak	<ul style="list-style-type: none"> • Minoritized and low-income infants may have less access to diverse and nutritious foods.^{53, 54}
6. Do not routinely prescribe or recommend the use of any hydrolyzed formulas for the specific prevention of food allergy or development of food sensitization.	Strong	<ul style="list-style-type: none"> • Minoritized and low-income children may have less access to formulas than White children.¹⁹
7. Do not recommend maternal exclusion of common allergens during pregnancy and lactation as a means to prevent food allergy.	Weak	<ul style="list-style-type: none"> • Non-Hispanic Black infants are less likely to be breastfed than other racial or ethnic groups.^{20, 21} • Factors associated with decreased likelihood of breastfeeding include race, ethnicity, geographic location, lower maternal education, younger maternal age, shorter maternity leave, lack of work-related breastfeeding support, household food insecurity, neighborhood disadvantage and segregation, and housing insecurity.^{20, 21}

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Table 2.

Clinical practice implications and research needs to address social disparities in preventing and managing food allergies in early childhood.

Domain	Clinical practice implications	Research needs
Infant feeding practices	<ul style="list-style-type: none"> • Consistently and equitably implement consensus recommendations for the primary prevention of food allergies • Refer mothers for lactation support when needed • Screen families for food insecurity • Refer or enroll families in government feeding programs (e.g., SNAP, WIC) 	<ul style="list-style-type: none"> • Assess disparities in access to specialty formulas • Develop strategies to increase access to formulas • Evaluate the impact of social determinants of health on early allergen introduction • Identify barriers to and facilitators of early allergen introduction • Assess disparities in these barriers and facilitators • Develop strategies to increase adoption of early allergen introduction guidelines
Meal management	<ul style="list-style-type: none"> • Screen families for food insecurity • Refer or enroll families in government feeding programs (e.g., SNAP, WIC) • Connect families with local food pantries and food banks 	<ul style="list-style-type: none"> • Define the burden of food insecurity among children and families with food allergies • Determine the proportion of families with food allergy reliant on nutrition assistance programs • Identify reasons that families with food allergies opt-out of nutrition assistance programs • Describe how food allergies impact food and income security • Assess disparities in meal management outside the home and school settings (e.g., eating out at restaurants or other social settings) • Develop strategies to increase access to safe and nutritious foods
Early childcare	<ul style="list-style-type: none"> • Discuss childcare plans and options with families • Provide written health management plans for all children with food allergy • Prescribe epinephrine autoinjectors for all children with food allergy • Ensure families have sufficient quantities of epinephrine autoinjectors for both home and childcare settings • Connect families with epinephrine autoinjector distribution programs • Provide food allergy education and management materials in plain language and multiple languages • Offer to collaborate with childcare centers and other stakeholders to develop and implement food allergy training programs and management policies when needed • Encourage caregivers providing relative care to attend clinic visits to learn about food allergy management and address any questions 	<ul style="list-style-type: none"> • Assess disparities in early childcare choices for families of children with food allergy • Describe the range of food allergy policies in organized childcare facilities • Determine the safety and psychosocial impacts of these policies • Describe how families relying on relative care manage food allergies • Evaluate the impact of social disparities in food allergy awareness and management in children cared for by relatives • Develop educational toolkits for healthcare provider and families to optimize food allergy-aware relative care

Domain	Clinical practice implications	Research needs
	<ul style="list-style-type: none"> • Have medical interpreters for multiple languages available during clinic visits 	
School	<ul style="list-style-type: none"> • Provide written health management plans for all students • Prescribe epinephrine autoinjectors for all students with food allergy • Ensure families have sufficient quantities of epinephrine autoinjectors for home, school, and after school settings • Connect families with epinephrine autoinjector distribution programs • Provide food allergy education and management materials to schools when needed • Offer to collaborate with schools and other stakeholders to develop and implement school food allergy training programs and management policies when needed 	<ul style="list-style-type: none"> • Evaluate disparities in how families manage school meals • Assess disparities in school food allergy management policies • Assess implementation of local, state, and federal food allergy management policies • Develop evidence-based food allergy management policies

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