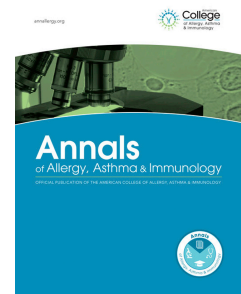


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Kiwako Yamamoto-Hanada, MD, PhD, John Ichiro Takayama, MD, MPH, Mayako Saito-Abe, MD, Masaki Futamura, MD, PhD, Yukihiro Ohya, MD, PhD



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Title page

Letters

Implementation science into the public - pregnant women need to prenatal visit for allergy prevention?

Authors: Kiwako Yamamoto-Hanada, MD, PhD¹, John Ichiro Takayama, MD, MPH², Mayako Saito-Abe, MD¹, Masaki Futamura, MD, PhD³, Yukihiro Ohya, MD, PhD¹

¹Allergy Center, National Center for Child Health and Development, Tokyo, Japan

²Department of Pediatrics, UCSF Benioff Children's Hospital, California, USA

³Division of Pediatrics, National Hospital Organization Nagoya Medical Center, Nagoya, Japan

Corresponding author: Kiwako Yamamoto-Hanada, MD, PhD.

Allergy Center, National Center for Child Health and Development

2-10-1, Okura, Setagayaku, Tokyo 157-8535, Japan

Telephone: +81-3-3416-0181

E-mail: yamamoto-k@ncchd.go.jp

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Abbreviations and Acronyms: adjusted odds ratio (OR), allergic rhinitis (AR), atopic dermatitis (AD), confidential interval (CI), food allergy (FA), National Center for Child Health and Development (NCCHD), randomized controlled trial (RCT), the National Institute of Allergy and Infectious Diseases (NIAID)

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Allergic diseases such as atopic dermatitis (AD), food allergy (FA), asthma and allergic rhinitis (AR) are common; according to a national birth cohort study in Japan, almost half of pregnant women reported a history of allergic disease.¹ Given that genetic factors, including family history, are predictors of allergic diseases in offspring, we expect the birth of many infants who carry a high risk of developing allergies. Among allergy prevention strategies, the effectiveness of primary prevention of eczema in high-risk infants by the topical application of emollient during the neonatal period has been demonstrated in two randomized controlled trials (RCTs).^{2, 3} Early introduction of allergenic foods, such as peanuts or eggs, has also been shown in RCTs to prevent later development of peanut or egg allergies in children.^{4, 5} On the other hand, maternal avoidance of allergenic foods during pregnancy and/or breastfeeding has not been shown to prevent allergies; a Cochrane review concluded that the “evidence is inadequate to advise women to avoid specific foods during pregnancy or breastfeeding to protect their children from allergic diseases such as eczema and asthma.”⁶ Health care providers should consider “implementation science” to incorporate evidence-based research findings into routine practice, and public health officials should disseminate such findings to the general public to assure effective translation of health services research into practical patient outcomes.⁷ Recently, the National Institute of

Allergy and Infectious Diseases (NIAID) published guidelines in the United States (US) recommending early introduction of peanuts to high-risk children with severe eczema, egg allergy, or both starting as early as 4 to 6 months of age after allergy testing as well as introduction of these foods to children with mild to moderate eczema at approximately 6 months of age. Recent research has shown, however, that only 31.3% parents in the US were willing to adhere to a recommendation of early introduction of peanuts to their children at approximately 6 months of age.⁸ Our research hypothesis is that we believe that during pregnancy, parents may be more willing to learn about evidence-based allergy prevention strategies. The purpose of this study was to clarify parental perceptions and attitudes during pregnancy regarding the prevention of the development of allergies in their infants as well as what factors might be associated with these perceptions and attitudes.

Our study utilized a cross-sectional design; data was collected through a paper questionnaire distributed between October 2017 and March 2018. We enrolled 132 parents of infants (age 0-2 years) with allergies who had completed first visits at the pediatric allergy clinic of the National Center for Child Health and Development (NCCHD) and 155 parents of infants (age 0-2 years) without allergies who were

identified as representative of the general population by the JMA Research Institute, Inc.

To maximize recall accuracy and minimize recall bias for events during pregnancy, we

only included parents of infants (age 0-2 years). The study was approved by the

institutional review board. An information sheet was distributed to all participants;

informed consent was not obtained since the survey was anonymous.

For statistical analysis, we used the t-test to compare continuous variables and the

chi-square test to compare categorical variables between parents with and without a

personal history of allergic diseases. JMP13 ® released by the SAS Institute, Inc. was

used for all analyses, and a P -value <0.05 was considered to be statistically significant.

Seventy-nine parents of infants with allergies (60%) and 107 parents of infants without

allergies (69%) completed the survey. Nearly all parents, 183 of 186, were mothers. The

prevalence of a personal history of allergic diseases (68.9% vs. 38.3%, $p<0.01$) was

higher within parents of infants with allergies compared to the prevalence among

parents of infants without allergies.

Table 1 compares knowledge and attitudes between parents with and without a personal

history of allergies. More parents with an allergy history, compared to parents without

such a history, were worried during pregnancy that their infants would develop allergies

(agree or agree strongly 74.5% vs. 45.1%, <0.0001) and expressed interest in participating in a prenatal visit focused on allergy prevention (90.2% vs. 72.5%, $p=0.0003$). Furthermore, more parents with allergies obtained information about allergy prevention during pregnancy (25.8% vs. 13.2%, $p=0.0296$) and were more aware of use of emollient application to prevent allergies (83.9% vs. 68.1%, $p=0.0118$).

A majority of parents did not fully understand evidence-based information about allergy prevention. Many parents reported that they would have participated in educational programming about allergies during pregnancy.

We must improve our practice in sharing evidence-based medical information regarding allergies with the public. This unwillingness regarding early allergenic solid food introduction⁸ might have been caused, in part, by inadequate communication between parents and health care providers. A meta-analysis found that good health literacy is associated with higher rates of adherence to treatment.⁹ To increase recognition of the importance of early introduction of allergenic foods in infants, we should identify effective methods for improving public literacy about allergy prevention.

In Japan, maternity classes (prenatal visits) are available to pregnant women in local hospitals and other public venues. Usually, these maternity classes include education

about infant growth, nutrition, the prevention of infections, and breastfeeding. Although almost half of pregnant women in Japan have a history of allergies, allergy education is not included in these classes. The American Academy of Pediatrics also recommends a prenatal visit for pregnant women in the third trimester;¹⁰ however, such a visit is not specifically dedicated to allergy prevention. We recommend that prenatal visits include information on allergy prevention for parents with a history of atopy since most offsprings will be at risk of developing allergic diseases. The perinatal period is a critical time for families to execute allergy prevention strategies. The evidence-based advice for pregnant women is that 1) allergenic food avoidance by mothers does not prevent offspring allergy, 2) delayed introduction of allergenic foods in early infancy is a risk factor for food allergy and 3) emollient application on the skin for high-risk infants could prevent onset of atopic dermatitis. To enhance parent literacy about evidenced-based practices for allergy prevention, we should reconsider how we share information about allergies with the public.

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Table 1 Perception and attitude toward allergy prevention, comparing between parents with allergy and those without allergy

	Parent without allergy (n=91)		Parent with allergy (n=94)		p-value
	n	%	n	%	
I had anxiety during pregnancy that my child may develop allergy					<0.0001
Strongly agree	4	4.4	20	21.3	
Agree	37	40.7	50	53.2	
Not agree	33	36.3	21	22.3	
Never agree	17	18.7	3	3.2	
I wanted to have a prenatal visit to discuss allergy prevention					0.0003
Strongly agree	5	5.5	21	22.8	
Agree	61	67.0	62	67.4	
Not agree	21	23.1	8	8.7	
Never agree	4	4.4	1	1.1	
I did collect information for allergy during pregnancy					0.0296
Yes	12	13.2	24	25.8	
No	79	86.8	69	74.2	
I did something for offspring allergy prevention during pregnancy					0.0056
Yes	5	5.5	17	18.5	
No	86	94.5	75	81.5	
I think pregnant women should avoid allergenic foods during pregnancy					0.6491
Yes	12	13.2	10	11.0	
No	79	87.8	81	89.0	
I think probiotic should be taken for allergy prevention during pregnancy					0.3308
Yes	53	58.2	47	51.1	
No	38	45.8	45	48.9	
I think children have high risk for allergic disease if parents have allergic diseases					0.2050
Yes	79	86.8	86	92.5	
No	12	13.2	7	7.5	

I think mothers should avoid consuming allergenic foods during lactation					0.8590
Yes	13	14.3	14	15.2	
No	78	85.7	78	84.8	
I think emollient application after birth could reduce risk of atopic dermatitis					0.0118
Yes	62	68.1	78	83.9	
No	29	31.9	15	16.1	
I think topical corticosteroids are not good for baby skin					0.4569
Yes	23	25.3	19	20.7	
No	68	74.7	73	79.4	
I think exclusive breastfeeding is appropriate for allergy prevention					0.5726
Yes	23	25.3	20	21.7	
No	68	74.7	72	78.3	
I think introduction of solids should be delayed for food allergy prevention					0.8748
Yes	16	17.6	17	18.5	
No	75	82.4	75	81.5	
I think egg introduction for infants should be delayed for egg allergy prevention					0.9481
Yes	40	44.0	40	43.5	
No	51	56.0	52	56.5	

Analysis by chi-square test, bold means
p<0.05