

LETTER TO THE EDITOR

Feeding practices of babies and the development of atopic dermatitis in children after 12 months of age in Armenia: Is there a signal?

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Abstract. We investigated the influence of feeding practices on development of atopic dermatitis (AD) in Armenian children (n = 240). In multivariate models early introduction to solids, family history of

atopy, and breastfeeding by a mother with atopic condition were associated with the development of AD after 12 months post-term. A prospective study in Armenia is recommended to confirm our findings.

Key words: Atopic dermatitis, Eczema, Solid food, Breastfeeding

The prevalence of atopic diseases such as asthma and atopic dermatitis (AD) in children has been rapidly rising throughout the world in recent decades, and urbanization and westernization are major factors responsible for this trend in developing countries [1, 2]. Early life events (infections, introduction of foods other than maternal milk, etc.) play a significant role in the clinical manifestation of atopic diseases in children [3–5]. Several studies have shown that breastfeeding offers a safe and effective mode of protection against AD during the first years of life [4, 6, 7]. However, other studies [8–15] do not support this finding, therefore the issue of protective effect of breastfeeding in the development of AD remains controversial. Armenia has implemented the National Breastfeeding Promotion program since the early 1990s. Pediatricians encourage mothers to breastfeed their children exclusively for 6 months, followed by initiation of complementary feeding, and continue breastfeeding for 2 years. According to the available statistics, there was considerable improvement in breastfeeding rates during the second half of the 1990s [16]. There was a stable increase in the rate of exclusive breastfeeding at 4 months, from 30.6 in 1995 to 54.0 in 1999 [17]. However, some important indicators, such as timely complementary feeding rate, and continued breastfeeding rate (> 12 months) are still low.

Our main purpose was to investigate the role of exclusive and non-exclusive breastfeeding and early solid food diet in development of AD in Armenian children. We conducted a case-control study from October 2003 until March 2004 to identify potential risk factors associated with the development of AD among children in Yerevan, Armenia. This study used the UK Working Party's Diagnostic Criteria for

Atopic Dermatitis (WPDCAD), which are validated for use in an epidemiological setting. [18] Cases were children aged 1–7 years, living in Yerevan, who have been diagnosed with AD by pediatricians at the Allergy Department of the Republican Children's Hospital in Yerevan and registered at the Registry of the Allergy Department, Armenia. Additional criterion for cases to be included in our study was onset of AD after 12 months post-term. Controls were children aged 1–7 years living in Yerevan who have never been diagnosed with AD. Controls were chosen from children's polyclinics providing outpatient health services to the population in those districts where the cases resided. A matching of study groups by age, gender and residence was applied. Mothers of children were contacted by phone, informed of the study, and asked to participate in the study. Informed consent was obtained from the participants before starting the interview by phone. For the development of the study questionnaire, the International Study of Asthma and Allergies in Childhood instrument [19] was used. The investigators supplemented it with additional questions related to the topic of interest. During this study, 240 participants were interviewed (85 cases out of 110, and 155 controls out of 163 attempted). The reasons of non-response were change of address of residence, change of the telephone numbers, no answers, and busy line. There were only two refusals to participate. It took about three months for all interviews to be completed.

The dependent variable was the presence or absence of AD. Independent variables of primary interest were duration of breastfeeding and age of solid food initiation of infants. A child was classified as being introduced to solid food if he was fed with at

least one of the following foods: cereal porridge, vegetables, fruits, meat, eggs, cottage cheese, bread or biscuit, and yogurt. The timing of the earliest of these foods was taken as time of introduction of solid food. A child was classified as being exclusively breastfed if he was breastfed without adding other foods, juices or water. The following factors were considered as potential confounders: birth weight, gestational age, presence of atopic diseases (eczema, asthma, wheeze, urticaria, allergic reactions to food, contact rashes, and hay fever) in the parents of subjects, surroundings of child's home, and antibiotic use in the first year of life.

This study was conducted in accordance with the Declaration of Helsinki and approved by a departmental Institutional Review Board committee of the College of Health Sciences of the American University of Armenia.

Multivariate backward logistic regression was used to model AD outcome against confounding factors described above and feeding regimen. All statistical tests were two-sided. Differences were taken as significant if $p < 0.05$. Statistical analyses were done using STATA version 6.0.

All 85 cases met the criteria of AD according to WPCAD as verified by questionnaire. Cases ($n = 85$) and controls ($n = 155$) were comparable with regard to the age, gender, weight at birth and gestational duration. Timing of cow milk, plain yogurt, cereal porridge and meat in our study did not affect the probability of developing AD in childhood. An increase in number of solid food items added to diet of children increased the odds of manifestation of AD during the first 7 years of life. Introducing solids to an infant before his 4th month of age increased his risk of developing AD later in the childhood (OR: 3.1, [95% CI: 1.4–6.9]) (see Table 1).

An adjusted odds ratio of 2.5 [95% CI: 1.3–5.2] was found for antibiotic exposure in first year of life representing an important risk factor for AD. An evidence of interaction has been found between paternal and maternal history of any atopy, and also between BF duration (≥ 6 vs. < 6 months) and maternal history of atopy. The paternal history of atopy increased the risk of AD (OR: 11.4, [95% CI: 4.5–28.9]), BF for 6 months or more and maternal history of atopy increased the risk of developing AD about 33 times with wide 95% confidence interval of 8.0–135.6 (BF at least 6 months and no maternal history of atopy was used as reference group), BF less than 6 months and maternal history of atopy had smaller OR: 7.2, [95% CI: 2.6–20.2], and BF less than 6 months and no maternal history of atopy did not significantly increase the risk of AD when compared to the reference group ($p = 0.080$, by Wald χ^2 test).

Our study was conducted in the capital of Armenia. A family history of atopy, followed by antibiotic exposure during the first year of life proved to be important risk factors for AD. We did not find any

Table 1. Multivariate logistic regression analysis of a case-control study of AD in children after 12th month of life, Yerevan, Armenia, 2003–2004

Variable	Adjusted		
	OR	95% CI	p (by Wald χ^2 test)
Solid food initiation before 4 months (vs. at 4 and after)	3.1	1.4–6.9	0.006
Paternal history of any atopy (yes vs. no)	11.4	4.5–28.9	0.000
Antibiotic exposure during first year of life (yes vs. no)	2.5	1.3–5.2	0.009
BF ≥ 6 months and no maternal history of atopy	1.0	–	–
BF ≥ 6 months and maternal history of atopy	33.0	8.0–135.6	0.000
BF < 6 months and maternal history of atopy	7.2	2.6–20.2	0.000
BF < 6 months and no maternal history of atopy	2.0	0.9–4.5	0.080

BF indicates breastfeeding; OR odds ratio; CI confidence interval.

additional protective effect of avoidance of solid food during the fifth and sixth months of age. In our study, BF increased the risk of AD only in children being breastfed by atopic mothers, especially for 6 months or longer.

In Armenia, according to the National Breastfeeding Program, mothers are encouraged to breast-feed their children exclusively for 6 months and to continue breastfeeding for 2 years with complementary feeding. Based on the results of this study we suggest that prospective studies with strict control for mothers' diet during pregnancy and breastfeeding are needed to investigate the association of breastfeeding and the development of AD in Armenian children with maternal history of atopy. In case of confirmation of the results of this study recommendations on breastfeeding for infants having maternal history of atopy in Armenia have to be revised.

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