

## Do early skin care practices alter the risk of atopic dermatitis?

### A case-control study

Marla E. Rendell, M.D.\*

Shahana F. Baig-Lewis, M.P.H.\*\*

Trista M. Berry, B.S.\*\*

Melissa E. Denny, M.D.\*

Brenda M. Simpson, B.A.\*\*

Peter A. Brown, B.S.\*\*

Eric L. Simpson, M.D., M.C.R.\*\*

Oregon Health & Science University

\*OHSU School of Medicine

\*\*Department of Dermatology

#### Key Words:

Atopic dermatitis

Skin barrier

Word Count: 603

Running short title: Do early skin care practices alter the risk of AD?

Funding Source: The National Eczema Association

The authors state no conflicts of interest.

#### Corresponding Author:

Eric L. Simpson, M.D., M.C.R.

Oregon Health & Science University

Department of Dermatology (CH16D)

3303 S.W. Bond Avenue

Portland, Oregon 97239-4501

503 494 3868 tel  
503 494 6907 fax  
[simspone@ohsu.edu](mailto:simspone@ohsu.edu)

## **ABSTRACT**

The rise in atopic dermatitis (AD) prevalence observed in industrialized countries is unexplained. We hypothesized that certain skin care practices early in life may increase the risk for developing AD. Our case-control study could not identify any one practice that increased the odds of developing AD, but revealed that regular lotion use was very common in infants who later develop AD.

## **INTRODUCTION**

The relatively low attributable risk of filaggrin (FLG) mutations in population-based AD studies suggest that, while FLG mutations are important, other factors are involved in promoting the full expression of the disease (1). Very little is known whether certain skin care practices can alter one's risk for developing AD. (2,3,4). The aim of the current study was to gather information regarding the skin care practices used in children prior to the development of AD. We further investigated whether specific practices, such as moisturizer use, are associated with an increased risk of developing AD.

## **STUDY DESIGN**

Overview. After institutional review board approval, a case-control study was performed examining the skin care used by parents and guardians on children prior to the onset of AD. Cases were defined as children five years of age or younger who met Hanifin-

Rajka criteria for AD. Normal controls were defined as children five years and younger without a history of AD and were included only if they had the following diagnoses: hemangioma, neoplasm, or congenital nevus. High-risk controls were defined as either one parent or sibling with a history of AD.

Sample size. We calculated that 75 subjects per group would be needed to detect with 80% power an odds ratio of 2.5 for the primary outcome of regular moisturizer use in the cases compared to the control group.

Setting. All cases and controls were recruited from the Oregon Health & Science University Department of Dermatology from the medical dermatology and pediatric dermatology clinics.

Statistical methods. Chi-squared tests were used for categorical data. ANOVA was used for comparisons of continuous data. Kruskal-Wallis tests were used for count data or where continuous data were not normally distributed.

## **RESULTS**

The baseline demographics are shown in Table 1. In the AD group, the average age of AD onset was  $7.8 \pm 9.9$  months of age. Regular moisturizer use was very common in all groups (76%) and we were unable to identify one specific skin care practice that significantly differed between groups. Of those who used moisturizers, lotions were the most commonly used moisturizer type in all groups (83%). The skin care practices used are summarized in Table 2.

## **DISCUSSION**

Our study highlights the widespread use of skin care practices in neonates and infants that may be potentially detrimental to the skin barrier. Because of the unanticipated high rate of moisturizer use in all groups, we were unable to determine whether the regular use of a moisturizer altered the risk for AD development. Despite current skin care guidelines that do not recommend regular moisturizer use in neonates (4), the majority of all caregivers in this population used them on a regular basis, with the vast majority of parents using watery lotions. Parents also bathed and cleansed their infants with soap or cleansers on a frequent basis. Water exposure (for example, via bathing or possibly lotion use) and cleansing are known to have detrimental effects on the skin barrier (5). Skin care practices that harm the skin barrier may potentially promote AD development. Our data reveal the importance of further research on the effect cleansing and moisturizing may have on neonatal skin physiology, given its routine use in some populations at risk for AD.

## **ACKNOWLEDGEMENT**

The authors wish to thank Christine E. Carocci for assistance with proof reading, editing, and preparation of this manuscript.

1. Weidinger S, O'Sullivan M, Illig T, et al. Filaggrin mutations, atopic eczema, hay fever, and asthma in children. *J Allergy Clin Immunol* 2008 May;121(5):1203-1209.
2. Walker L, Downe S, Gomez L. Skin care in the well term newborn: two systematic reviews. *Birth* 2005 Sep;32(3):224-228
3. Macharia WM, Anabwani GM, Owili DM. Effects of skin contactants on evolution of atopic dermatitis in children: a case control study. *Trop Doct* 1991 Jul;21(3):104-106.
4. National Institute for Health and Clinical Excellence: Routine post-natal care of women and their babies. Clinical Guideline 37, 2006. See: [www.nice.org.uk](http://www.nice.org.uk) (Accessed July, 2010).
5. Tsai TF and Maibach HI. How irritant is water? An overview. *Contact Dermatitis* 1999 Dec;41(6):311-314.

**Table 1.** Study Demographics (n=225). This was primarily a Caucasian population of higher socioeconomic status.

<b>Variable</b>	<b>Value for all Groups Combined</b>
Average age of child (years)	3.0
<b>Ethnicity</b>	
Caucasian	65.5%
African American	2.0%
Asian	12.2%
Mediterranean	0.5%
Hispanic	12.7%
Other	7.1%
<b>Annual family income</b>	
0	0.5%
<\$15,000	5.9%
\$15,000-\$30,000	6.4%
\$31,000-\$45,000	7.4%
\$46,000-\$60,000	17.2%
\$61,000-\$75,000	14.7%
>\$75,000	48.0%
<b>Disease Severity (AD group only)</b>	
Mild	62.3%
Moderate	24.6%
Severe	13.0%

**Table 2.** Skin care practices in children who developed atopic dermatitis (AD) compared to non-atopic controls (NAD) and children at high-risk for developing AD (ADHR).

Skin Care Practice Variable	AD n=100	NAD n=75	ADHR n=50	P-value
<b>Moisturizer Use</b>				
Any moisturizer used in first 6 months? (%)	76	74.7	78	0.913
Age when moisturizer use started (months)	0.8	1.0	0.8	0.869
Number of times moisturizer applied/week	4.6	4.0	3.8	0.177
What type of moisturizer used?				
None (%)	24.0	24.0	22.0	
Lotion or cream in a pump (%)	63.0	61.3	66.0	
Greasy cream (%)	7.0	5.3	8.0	
Liquid oil (%)	6.0	5.3	4.0	
Ointment (%)	0.0	4.0	0.0	0.562
When was moisturizer applied?				
Right after bathing while skin moist (%)	54.7	50.9	51.3	
After bathing but when skin dry (%)	33.3	28.1	33.3	
Anytime during the day (%)	8.0	1.8	5.1	
Only if skin dry (%)	1.3	8.8	0.0	
On and off (%)	2.7	10.5	10.3	0.101
<b>Bathing and Cleansing</b>				
# of baths/week during first 6 months	4.2	4.0	4.0	0.881
# of baths/week from 6-24 months	5	4.9	4.7	0.797
Percent who used soap or cleanser (%)	90	92	98	0.214
# of baths/week during first 6 months	4.2	4.0	4.0	0.881
<b>Skin Features</b>				
Xerosis (%)	55	21.3	10	<0.0001
Ichthyosis (%)	28	1.3	4	<0.0001