

## Atopic Dermatitis and Atopy in Non-Clinical Populations

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A group of 523 individuals from the general population in the Denver, Colorado area responded to an advertisement for subjects with "problem skin" conditions, such as eczema, dry skin, rashes, etc. The subjects completed screening history information and were evaluated for various characteristics during an examination by a dermatologist. Of the entire population, 33% satisfied the criteria for atopic dermatitis. Another group, described as the generic atopy subset, emerged from the classification and constituted 23% of the total. Individuals in this subset typically had either a personal history of atopic disease or a limited family history. They lacked past or present evidence of flexural rash. A third group, totaling 44%, was classified as non-atopic. A relatively large percent of each of the three groups exhibited some clinical signs of dry skin (e.g., scaling, flakiness). This feature is believed to be due, at least in part, to the damaging effects of the cold, dry conditions in Denver, Colorado. **Key words:** Atopic dermatitis; Atopy; Generic atopy; Non-atopic; Dry skin; Criteria.

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In the general population, atopy is estimated to occur in 30% of individuals. The prevalence of atopic skin disease is increasing and the incidence is judged to be 10% (1). In cool and/or dry climates, the occurrence is higher than for more tropical environments (2). In most locations in the United States, cool/dry conditions occur at some time during the year. The objective of this work was to select from the general adult population a homogeneous group of individuals with the characteristics of atopic dermatitis to participate in clinical trials in a low humidity setting.

In this paper, the atopic dermatitis criteria and the results of the evaluation of 523 subjects are presented. The features are reviewed for each of the three groups: atopic dermatitis, generic atopy, and non-atopic, which were derived from this population.

### METHODS

#### Subjects

The subjects were volunteers recruited from the general, non-clinical population in the dry climate of Denver, Colorado during the months from July of one year to January of the next. They were contacted via an advertisement for individuals with "problem skin". The specific wording of the advertisement is as follows:

#### PROBLEM SKIN

If you have skin problems, such as eczema, dry or itchy skin, rashes, or allergies, you could be eligible ... Name of testing agency, phone number

The participants were limited to people between the ages of 18 and 50 years in order to eliminate individuals of elderly xerosis. Both males and females were accepted. The respondents were asked to visit a test facility in Denver to provide a medical history and to be examined by a dermatologist.

#### Evaluations

At the test facility, the subjects completed a form which provided information about their history of each of the following conditions: recurrent skin disease, eczema, eczema in flexural areas, dry skin, dry skin on hands, family history of skin disease, allergies, hay fever, asthma, family history of allergies/hay fever/asthma, sensitivity to shampoo/laundry detergent/etc. They were then examined by a dermatologist for the current presence or a history of each of the features listed in Table 1. The age of onset of recurrent skin disease was also noted.

#### Criteria

The criteria for classification as atopic dermatitis (AD) was modified from previous schemes (3) for greater simplicity and efficiency of use. To be considered as AD, subjects were required to have each of the following criteria: (a) personal or family history of allergy or eczema, (b) recurrent eczema (past or present), (c) pruritus, and (d) rash ever occurring in the flexural areas (elbow creases, popliteals, or behind ears). If any of these four features were missing, at least two of the following modifiers were required: (a) onset of skin disease in infancy, (b) nipple dermatitis, (c) condition worsens with stress or sweating, (d) hand eczema in childhood, and (e) cheilitis.

For classification as generic atopy, the criteria were the following: (a) Two or more of (1) personal or family history of atopic disease, (2) recurrent skin disease, and (3) pruritus; (b)

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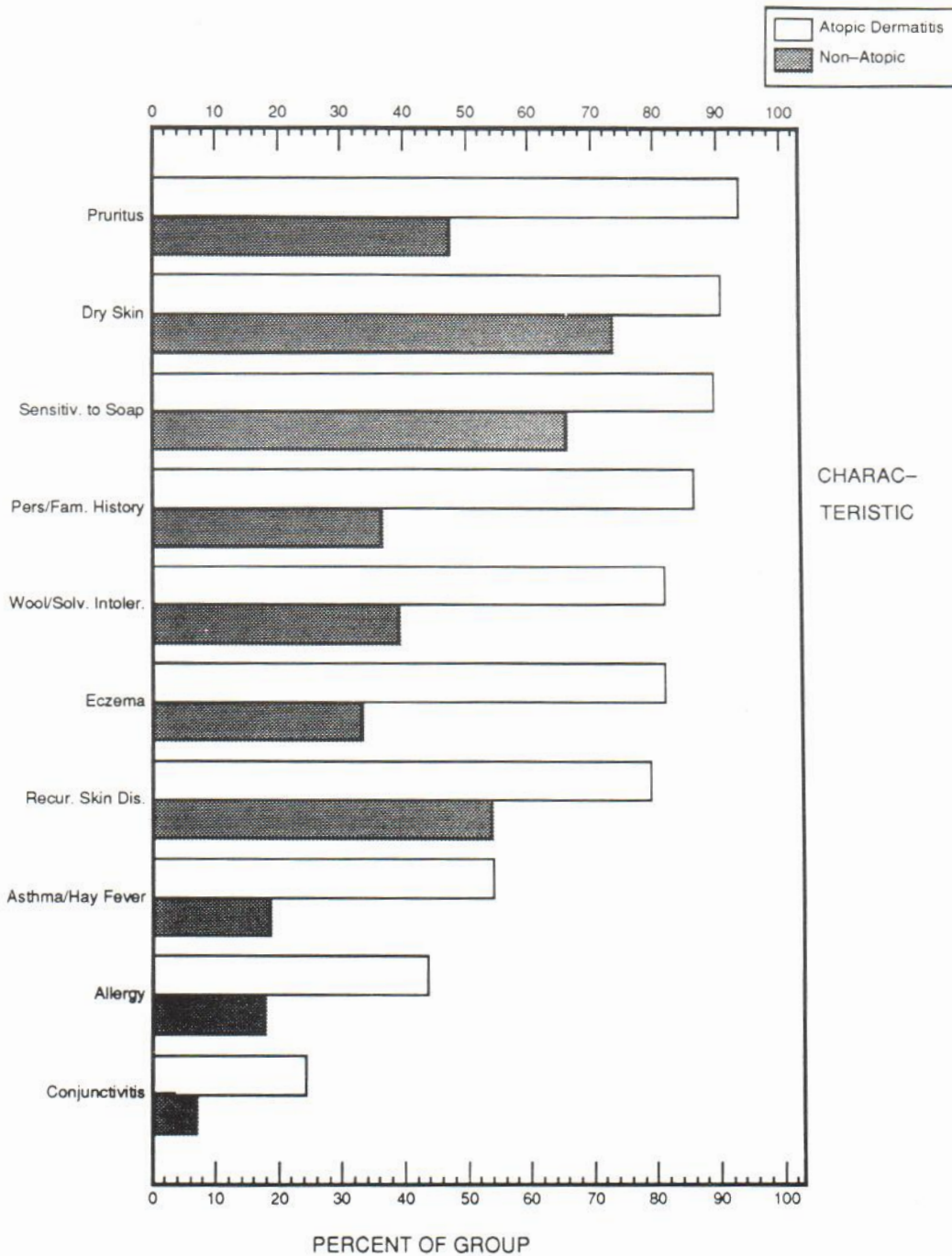
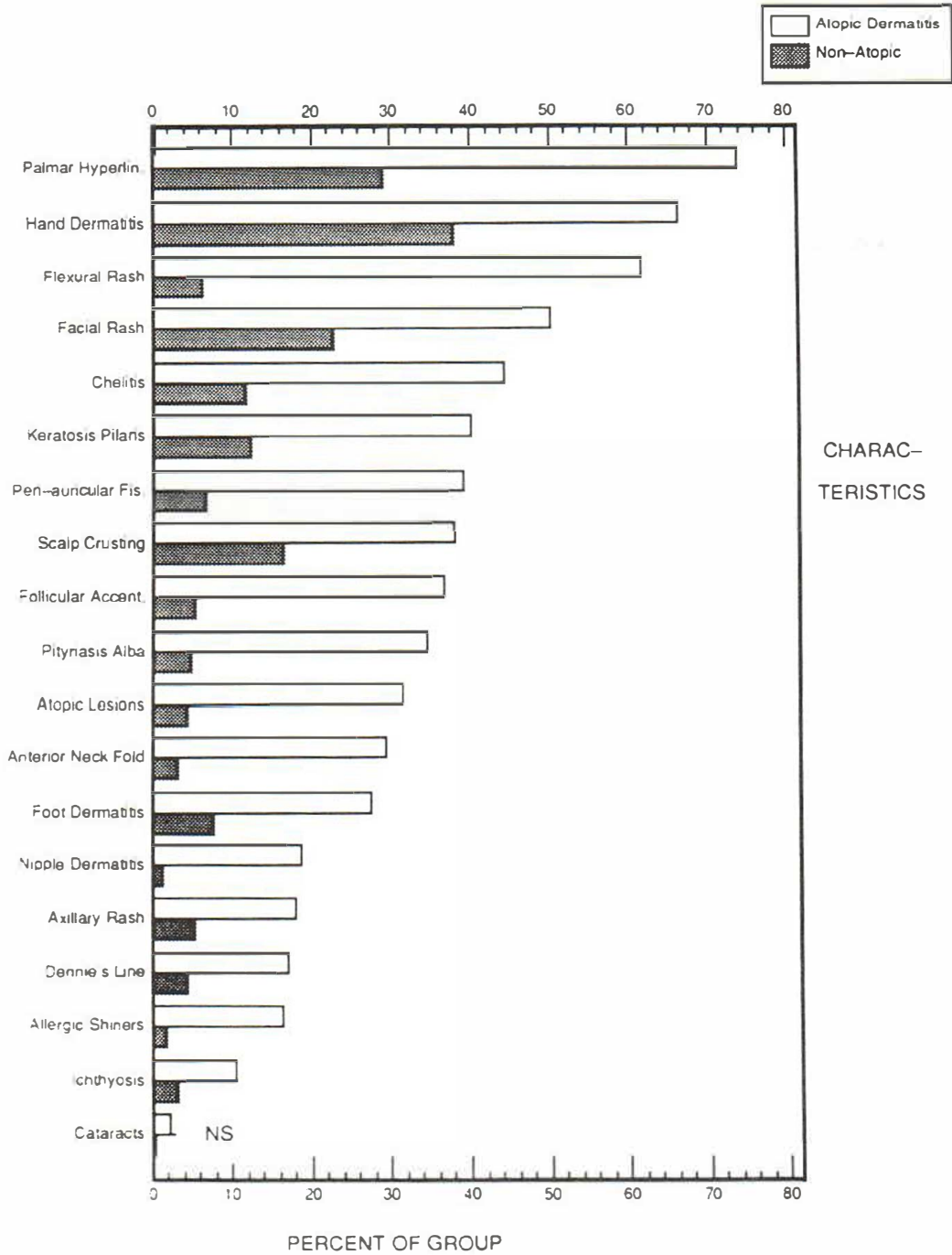


Fig. 1. Characteristics of the atopic dermatitis group compared to the non-atopic group. Each characteristic from the screening history and dermatologist examination is reported as a percent of each group ( $n=172$  for the atopic dermatitis

group and  $n=225$  for the non-atopic group). All differences between the two groups are significant ( $p \leq 0.05$ ) unless indicated by NS.



CHARACTERISTICS

NS indicates differences between the two groups are non-significant.

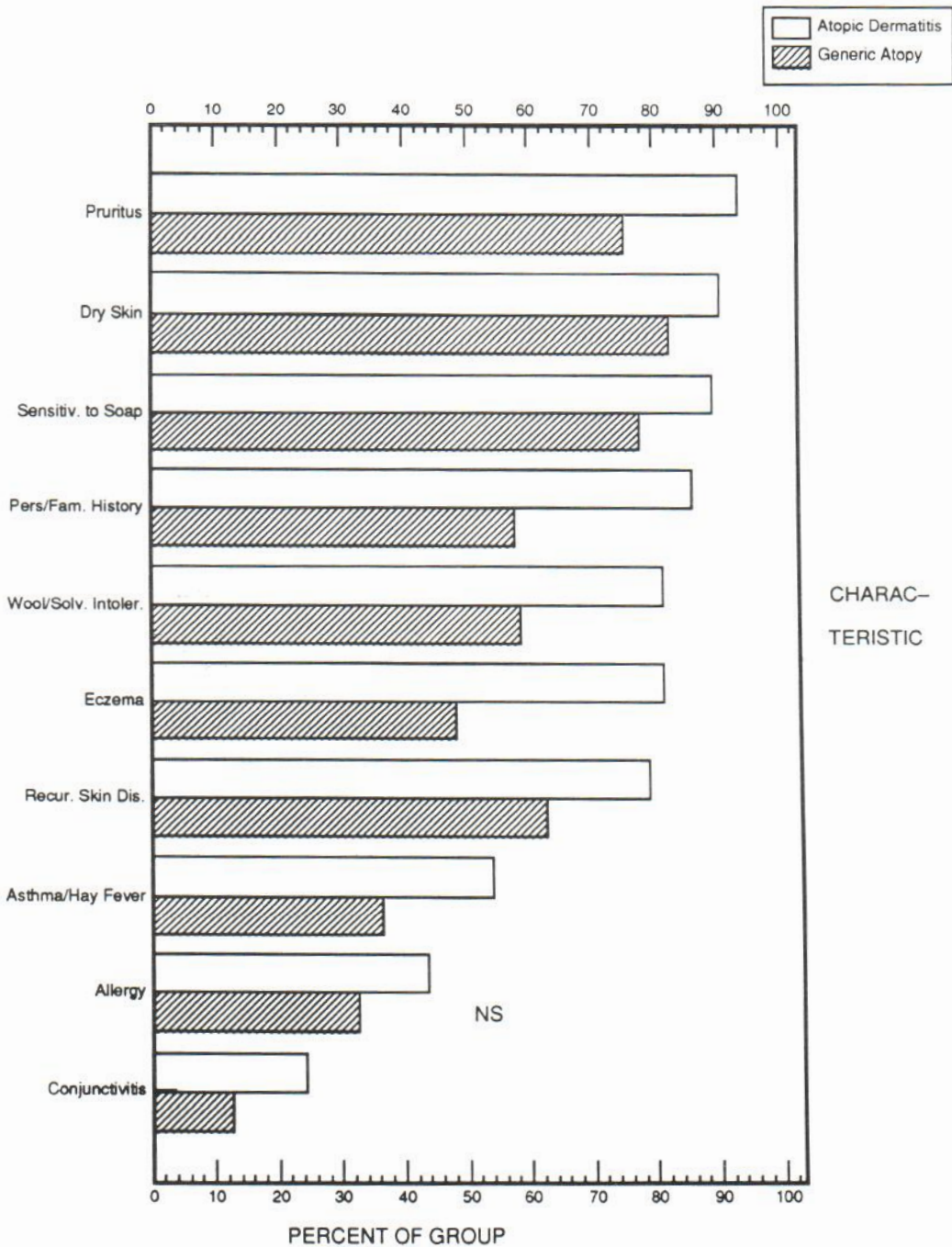


Fig. 2. Characteristics of the atopic dermatitis group compared to the generic atopic group. Each characteristic from the screening history and dermatologist examination is reported as a percent of each group ( $n=172$  for the atopic

dermatitis group and  $n=126$  for the generic atopy group). NS indicates that the differences between the two groups are non-significant. All other differences are significant ( $p \leq 0.05$ ).



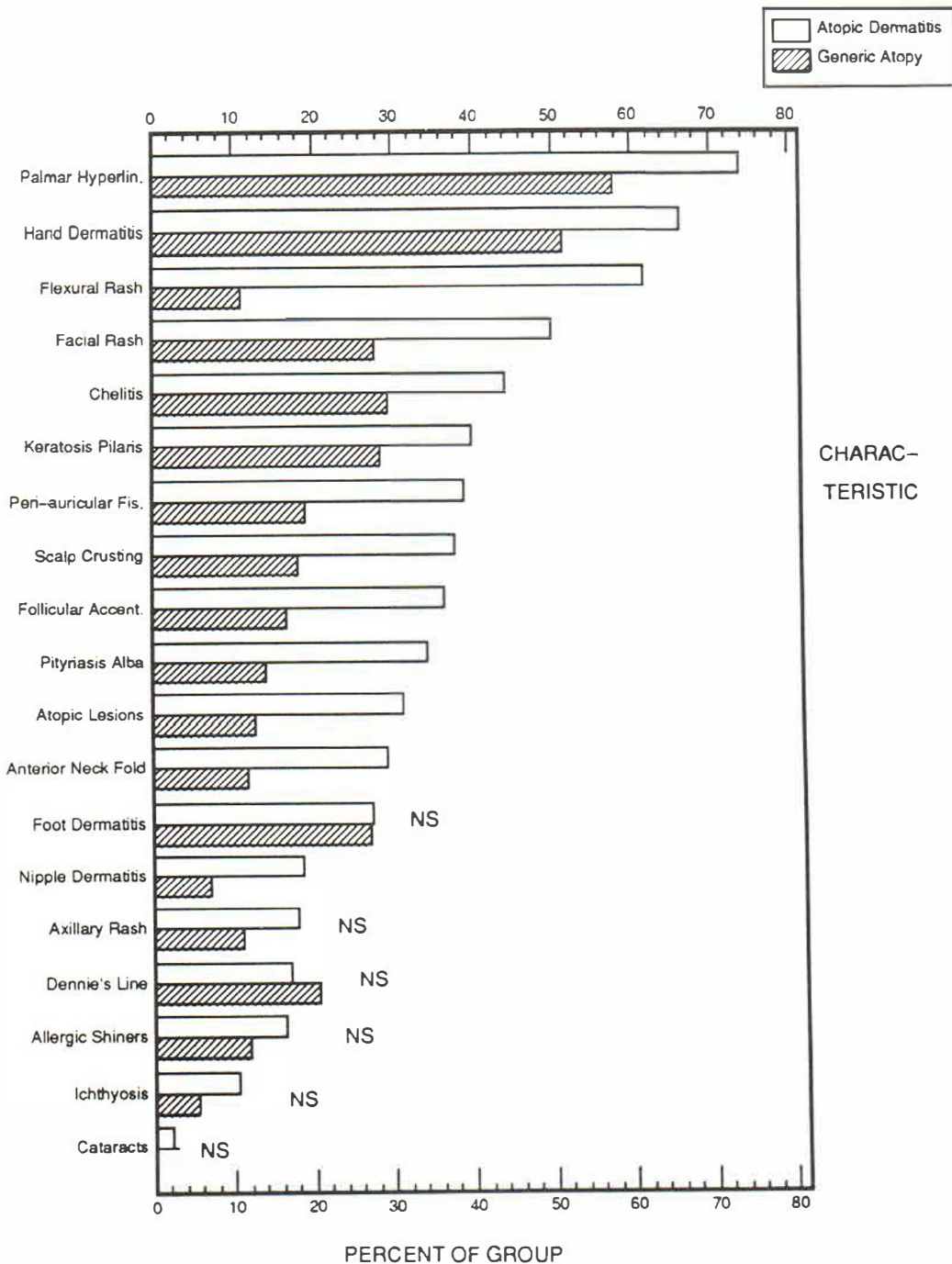


Table I. Characteristics of atopic dermatitis group

History		Physical findings	
Characteristic	Percent	Characteristic	Percent
Pruritus	94	Dry skin	91
Dry skin	98	Palmar hyperlinearity	74
Sensitivity to Products	90	Hand dermatitis	66
Personal/family history of allergy	86	Flexural rash	62
Wool/solvent intolerance	81	Facial rash	50
Eczema	81	Cheilitis	44
Recurrent skin disease	79	Keratosi pilaris	40
Asthma/hay fever	54	Peri-auricular fissures	39
Allergy	44	Scalp crusting	38
Conjunctivitis	24	Follicular accentuations	37
Cataracts	2	Pityriasis alba	34
		Atopic lesions	31
		Anterior neck fold	29
		Foot dermatitis	27
		Nipple dermatitis	19
		Axillary rash	18
		Dennie's line	17
		Allergic shiners	16
		Ichthyosis	10

A family history limited to one parent or sibling; and (c) No past or present history of flexural eczema.

Subjects who were classified as non-atopic typically exhibited one of the following: (1) personal or family history of atopic disease, (2) recurrent skin disease, and (3) pruritus.

## RESULTS

Over a period of several months, a total of 523 subjects were evaluated. Of these, a total of 172 subjects (33%) were atopic dermatitis (AD). The percentage of individuals exhibiting each of the characteristics from both the screening history and the physical examination is shown in Table I.

A total of 225 subjects (44%) were classified as non-atopic. A comparison of the atopic dermatitis and non-atopic groups is shown in Fig. 1. Some of the features were present in certain of the non-atopic subjects. However, a statistical comparison of the two groups indicated that there was a significantly higher percentage of AD subjects with each of the characteristics except cataracts. This feature was present in only 11 of the 523 individuals. For the AD group, the most prevalent characteristics were: pruritus, dry skin, personal or family history of allergy/asthma/skin disease, recurrent skin disease, palmar hyperlinearity, wool/solvent intolerance, hand dermatitis, and flexural rash.

The generic atopy group constituted 126 individuals (23% of the total population). A comparison of this group with the AD subset is provided in Fig. 2. For the generic atopy population, the percent of subjects with any given characteristic was significantly lower than the percent for the AD group for all characteristics except: allergy, foot dermatitis, axillary rash, Dennie's line, allergic shiners, ichthyosis, and cataracts. The items which most clearly differentiated these two groups were: flexural rash, eczema, personal/family history of atopic disease (presumably because of the limited family history), facial rash, and wool/solvent intolerance.

For the entire population, the number of subjects who exhibited ichthyosis was 32. This trait was observed in a total of 10% of the AD population.

## DISCUSSION

For this non-clinical group of individuals who responded to an advertisement for "problem skin", 33% were classified as atopic dermatitis. Because the advertisement was directed at people with skin problems, this is clearly a selected sample. It is expected that the percentage of AD individuals from the general population at random would be more consistent with the estimated incidence of 10% (1). A second

subset of this non-clinical population, referred to as the generic atopy group, was 23% of the total. These individuals exhibited many of the characteristics of AD. However, for individuals without a personal history of atopy, the family history was generally limited to one parent or sibling (data not shown). The flexural rash was not present upon examination or evident from the history. Together, the two atopic subsets represented 56% of the population, a number which is larger than the estimate of 30% for atopy. This higher incidence is probably due to the fact that a selected group (i.e., individuals with skin problems) responded to the advertisement and were evaluated.

Dry skin (scaling, flaking) was observed by the dermatologist in the physical examination for 91% of the AD group, 82% of the generic atopy subject, and 73% of the non-atopic group. This condition is believed to

be due, at least in part, to the damaging effects to the skin of cool, dry climates (4), such as that of Denver, Colorado in the Fall and Winter seasons. It is also noteworthy that a relatively large percentage of subjects in each group report a sensitivity to products such as shampoos, laundry detergents, and wool.

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