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Positive skin prick tests of immediate type in non-allergic children

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Prick tests with twenty different Bencard antigens were performed in 300 children aged 2–16 years, all having a negative individual and familial history for allergic disease. At least one positive result was obtained in 64% of the children and among the 6000 tests a total of 727 were positive. Of the positive tests 93% were + or ++, 7% were +++ or ++++. No relationship was found between age and the incidence of positive skin tests. Mild reactions against more than one antigen in the same individual were quite frequent, pronounced reactions (+++ or ++++) against more than one antigen were exceptional. The incidence of mild reactions was found to be independent of the gender; strong reactions occurred in girls twice as often as in boys. The highest incidence of positive reactions was observed with house-dust mite, pollens, hay and straw dust, and canine and feline hairs. The diagnostic value of mild positivity is slight but pronounced positivity, especially against more than one antigen, must carefully be considered and in any case followed by a bronchial provocation test.

Airway allergy plays a prominent role among diseases of allergic origin. Identification of the precipitating antigen is important in diagnosis and therapy alike, specific causal treatment being based on such a knowledge. The history, prick tests, RAST determinations and airway provocation tests are the most widely used tools in identification of the allergen(s). These methods are of various reliability. Reliability is satisfactory if (*i*) the method gives no negative result with the causative antigen and (*ii*) no false positive result occurs in healthy individuals. Immediate type skin reactions fulfil these expectations to a certain degree. Only to a certain degree since positive reactions may also be encountered among healthy persons.

In this study we have attempted to determine the incidence of positive prick tests among healthy Hungarian children.

Materials and Methods

Three-hundred children, 146 boys and 154 girls ranging in age from 2 to 16 years, were selected for the study. The history revealed no allergic disorder in the children and in their first-degree relatives. The list of the twenty Bencard allergens used in the study can be seen in Fig. 3. The prick test was performed according to the recommendation of the makers: a drop of the solution containing the antigen is placed onto the flexor surface of the forearm, the prick is carried out by a lancet through the drop of antigen solution. The result is read after 15–20 min. A prick using the control solution supplied with the antigens is carried out in each case; this solution contains except the antigen itself all solvents and preservatives used throughout the procedure of production.

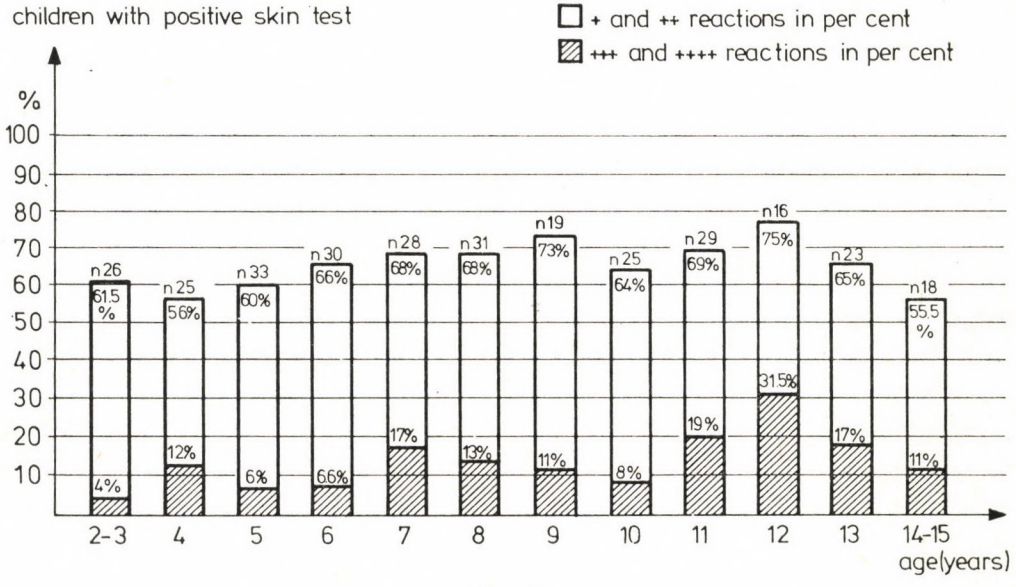
children with positive skin test
+ and ++ reactions in per cent
+++ and ++++ reactions in per cent
%
100
90
80
70
60
50
40
30
20
10
n 26
61.5 %
4%
n 25
56%
12%
n 33
60%
6%
n 30
66%
66%
n 28
68%
17%
n 31
68%
13%
n 19
73%
11%
n 25
64%
8%
n 29
69%
19%
n 16
75%
31.5%
n 23
65%
17%
n 18
55.5 %
11%
2-3
4
5
6
7
8
9
10
11
12
13
14-15
age(years)

FIG. 1

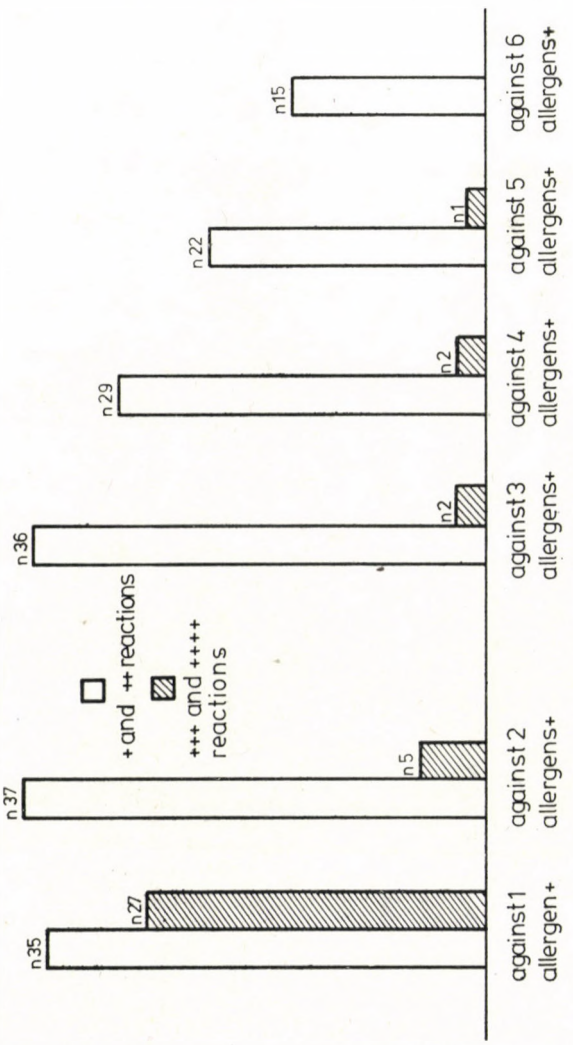
n35
n27
n37
n5
n36
n2
n29
n2
n22
n1
n15
+ and ++ reactions
+++ and ++++ reactions
against 1 allergen+
against 2 allergens+
against 3 allergens+
against 4 allergens+
against 5 allergens+
against 6 allergens+

FIG. 2

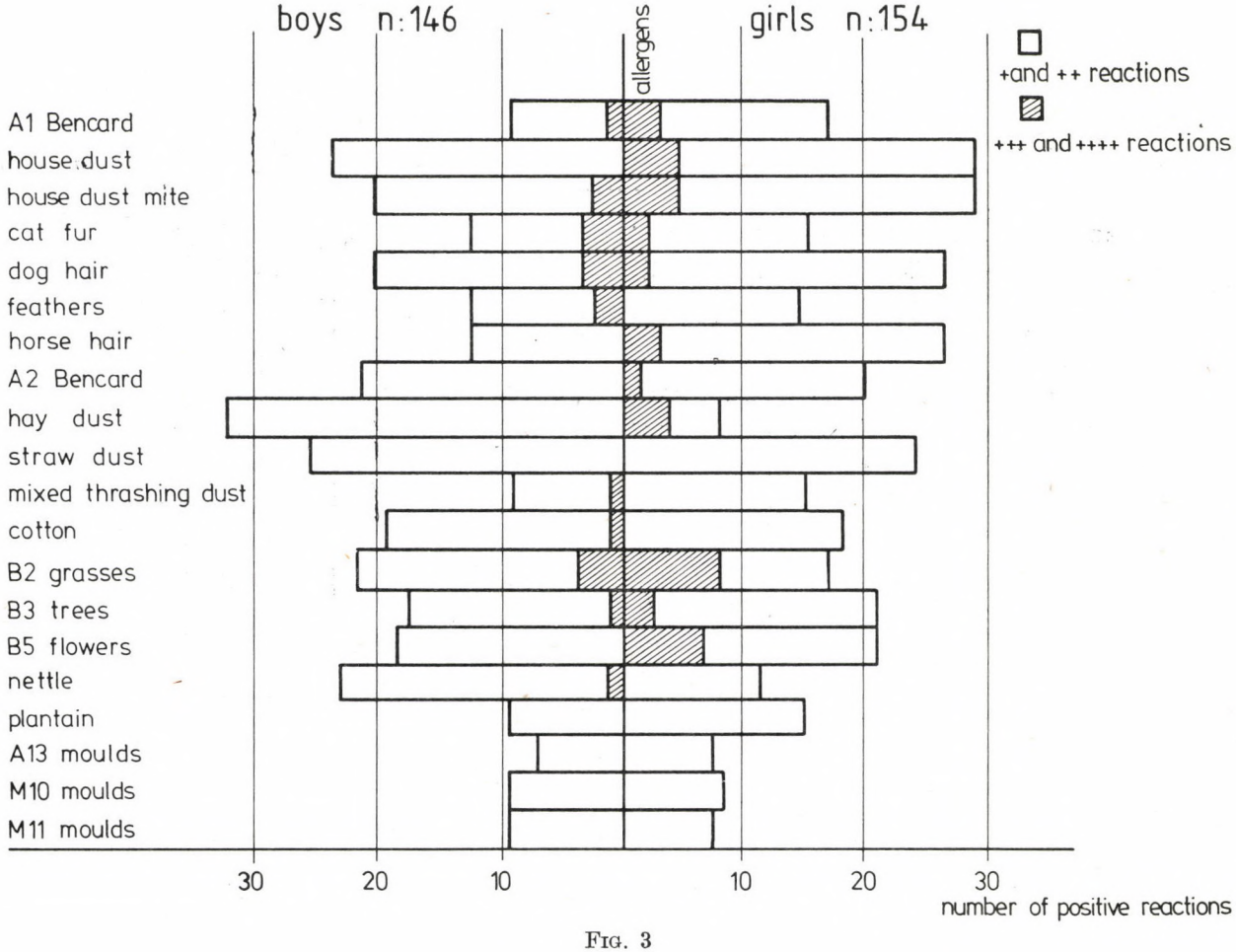
boys n:146
girls n:154
allergens
+and ++ reactions
+++ and++++ reactions
A1 Bencard
house dust
house dust mite
cat fur
dog hair
feathers
horse hair
A2 Bencard
hay dust
straw dust
mixed thrashing dust
cotton
B2 grasses
B3 trees
B5 flowers
nettle
plantain
A13 moulds
M10 moulds
M11 moulds
30
20
10
10
20
30
number of positive reactions

FIG. 3

In evaluation the following scoring was used

+ no urtica, erythema smaller than 3 mm in diameter;
++ urtica up to 3 mm in diameter, pronounced erythema;
+++ urtica 3–5 mm in diameter plus erythema;
++++ urtica exceeding 5 mm in diameter usually with pseudopodium formation, marked erythema.

Results

Among the 6 000 tests, each 20 in 300 children, 727 were positive and 5 273 were negative. 93% of all positive results (95% in boys and 91% in girls) were of grade + or ++, while grades +++ or ++++ made up only 7% of all positive reactions (5% in boys, 9% in girls). 192 out of the 300 children had a positive reaction against at least one antigen; i.e. 64% for both sexes, 66% for boys and 62% for girls. In girls, the incidence of severe positivity (+++ or ++++) was twice as high as in boys. Unexpectedly, the incidence of positive skin reactions was not higher in school children than in children between 2 and 4 years of age; thus age did not seem to have any effect on this incidence (Fig. 1).

Mild, + or ++, reactions against a high number of antigens were seen quite frequently. Strong reactions, rating +++ or ++++, against more than one antigen were exceptional (Fig. 2).

Figure 3 demonstrates that mild reactions occurred with the same frequency in boys and girls; the more severe degrees of positivity are more frequent in girls.

The following antigens provoked positive reactions at an appreciable rate: house-dust, house-dust mite, hay and straw dust, pollens, canine and feline hairs (Fig. 2).

Discussion

Positive skin reactions to various antigens are a common finding in healthy adults [3, 4, 6, 11, 12]. Halonen et al [6] found a higher incidence in young adults. In the accessible literature we found no data for healthy children. According to the present results, two-thirds of healthy Hungarian children aged 2 to 16 years, with no history of allergy, gave a + or ++ positive reaction against one or more of twenty Bencard allergens.

In agreement with data in the literature, we feel that the diagnostic and clinical importance of such positivity is very restricted. Our finding concerning strong +++ or ++++ positivity in a small but definite percentage of healthy children seems to be unique. This higher incidence of a strong positive result in girls (9%) compared to boys (5%) can be related to the observation that freedom from symptoms in the presence of an increased IgE level occurs more frequently in girls than in boys.

We have thus drawn the conclusion that + and ++ positivity is of questionable importance, and also that +++ or ++++ reactions cannot be regarded a dependable indication of allergy. Our findings corroborate the opinion [1, 2, 7, 8, 9, 10] that a strong positive result of a prick

test performed correctly is an indication for a bronchial provocation test, as even in the presence of a positive history and a positive prick test only 30—80% of the cases exhibit a positive reaction to the same allergen when used in a bronchial provocation test. According to these findings, immunotherapy protracted over years means to the patient a considerable load not without risks and is superfluous in 20—70% of the cases if indication for this form of treatment is based only on the result of the skin test. The closest relationship was found by all authors between the result of bronchial provocation and a ++++ positive skin test.

For evaluation of +++ or ++++ results we refer here to the findings of Hagy et al [5]; these authors performed skin tests in 903 healthy young persons and followed them during seven subsequent years. Allergic disease supervened with a significantly higher frequency in those exhibiting a strong positive reaction at the beginning of the study. Atopy in family members further increased the risk. Still, we feel that a positive reaction of +++ or ++++ intensity cannot simply be regarded as a normal scatter of the method.

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