

Patch Test Reactions in Atopic Patients

S. MARGHESCU

Hautklinik Linden der Medizinischen Hochschule und der Landeshauptstadt Hannover

The cell-mediated immunity of atopic patients appears to be impaired. The increased rate of bacterial and viral infections and their more frequent severity, the decreased rate of positive reactions to microbial antigens such as tuberculin, trichophyton, staphylococcal or streptococcal antigens using intracutaneous tests (6) and several immunologic in vitro assays (8) suggest a deficiency of the T cell system in atopics. So, it is not surprising, that a decreased response to contact allergens in atopics is discussed. Nevertheless, the incidence of allergic dermatitis superimposed on atopic dermatitis is still controversial in the literature. So, Pürschel (5) found an incidence of atopic dermatitis with contact sensitivity to ten contact allergens in 0.1 to 1.5%. On the other hand, Bandmann (1) arrives to an incidence of 31%. To the origin of contact allergens in atopics, there are controversial responses too. The uncertainty culminates in the question, whether the contact sensitivity in atopics is due to allergens currently prevalent in the population as, for example, nickel sulphate or potassium dichromate, or due to topical agents as a result of the continuous treatment. Malten (4) found, for example, in atopics a contact sensitivity to nickel sulphate in 18 to 57%, Wahlberg & Skog (7) on the other hand only in 9%. Bandmann et al. (2) stated the importance of agents in the topical treatment in atopics, similar to the results in patients with leg ulcers and stasis dermatitis.

In our clinic a standard set of 60 allergens was patch-tested on 4609 patients with different dermatoses (3) suspected to be contact allergic. 1803 patients with contact dermatitis showed a positive reaction in 57.9%, 129 atopics in 39.5%, 138 patients with dyshidrotic hand dermatitis in 44.9% and 652 patients with leg ulcers and stasis dermatitis in 72% (Table I). The number of positive reactions is lower in atopics than in the other groups, but the difference is not significant. The ten most important allergens in the different groups, listed in order of frequency is shown in Tables II-VI. The summarized results (Table VII) demonstrate the first position of nickel sulphate in all groups, except in the patients with leg ulcers and stasis dermatitis. A positive concordance for para-aminoazobenzene in contact and atopic dermatitis for tincture of iodine in contact, atopic and dyshidrotic dermatitis, and a negative concordance for benzocaine in contact, atopic and dyshidrotic dermatitis was demonstrated. In patients with leg ulcers and stasis dermatitis, the first three allergens are the preservatives parahydroxybenzoic acid, benzo-

Table I. Number of tested persons

	TESTED	POSITIVE REACTIONS	% POS.
IN ALL	4609	2346	50.9
CONTACT D.	1803	1044	57.9
ATOPIC D.	129	51	39.5
DYSHIDROTIC HAND D.	138	62	44.9
LEG D.	652	473	72.5

Table II a. Hit-list of all tested patients I

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
1	NICKEL SULFATE	15.3	7.8
2	PARA-HYDROXYBENZOIC ACID	11.9	6.1
3	PARA-AMINOAZOBENZENE	10.9	5.6
4	BALSAM OF PERU	10.9	5.6
5	TINCTURE OF IODINE	10.8	5.5

Table II b. Hit-list of all tested patients II

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
6	BENZOCAINE	10.2	5.2
7	POTASSIUM DICHROMATE	9.5	4.8
8	BENZOQUINONE	8.4	4.3
9	COBALT CHLORIDE	8.3	4.2
10	WOOD TARS	8.1	4.1

Table III a. Hit-list of atopic dermatitis I

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
1	NICKEL SULFATE	19.6	7.8
2	COBALT CHLORIDE	13.7	5.4
3	PARA-AMINOAZOBENZENE	7.8	3.1
4	WOOD TARS	7.8	3.1
5	MERCAPTOBENZOTHIAZOLE	7.8	3.1

Table III b. Hit-list of atopic dermatitis II

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
6	PARA-PHENYLENEDIAMINE	7.8	3.1
7	TINCTURE OF IODINE	5.9	2.3
8	POTASSIUM DICHROMATE	5.9	2.3
9	CHLORAMPHENICOL	5.9	2.3
10	BALSAM OF PERU	5.9	2.3

Table IV a. Hit-list of contact dermatitis I

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
1	NICKEL SULFATE	19.9	11.5
2	POTASSIUM DICHROMATE	14.3	8.3
3	PARA-AMINOAZOBENZENE	12.6	7.3
4	COBALT-CHLORIDE	11.2	6.5
5	PARA-HYDROXYBENZOIC ACID	10.2	5.9

Table IV b. Hit-list of contact dermatitis II

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
6	BALSAM OF PERU	9.8	5.7
7	TINCTURE OF IODINE	9.3	5.4
8	PARA-BENZOQUINONE	9.2	5.3
9	PARA-AMINODIPHENYLAMINE	8.7	5.0
10	COLOPHONY	8.2	4.8

Table V a. Hit-list of dyshidrotic hand dermatitis I

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
1	NICKEL SULFATE	21.0	9.4
2	POTASSIUM DICHROMATE	14.5	6.5
3	PARA-AMINODIPHENYLAMINE	11.3	5.0
4	FORMALDEHYDE	9.7	4.3
5	COLOPHONY	9.7	4.3

Table V b. Hit-list of dyshidrotic hand dermatitis II

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
6	WOOD TARS	9.7	4.3
7	COBALT CHLORIDE	8.0	3.6
8	TINCTURE OF IODINE	6.5	2.9
9	NEOMYCIN SULFATE	4.8	2.2
10	TETRAMETHYLTHIURAM-DISULFIDE	4.8	2.2

Table VI a. Hit-list of leg dermatitis I

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
1	PARA-HYDROXYBENZOIC ACID	25.0	18.0
2	BENZOCAINE	22.4	16.3
3	BALSAM OF PERU	20.9	15.2
4	WOOL WAX ALCOHOLS	20.9	15.2
5	EUCERIN	19.9	14.4

Table VI b. Hit-list of leg dermatitis II

OR- DER	ALLERGEN	% POS. COLL.	% TESTED COLL.
6	NEOMYCIN SULFATE	18.6	13.5
7	PARA-AMINOAZOBENZENE	13.1	9.5
8	TINCTURE OF IODINE	12.5	9.0
9	LANETTE N	11.4	8.3
10	COLOPHONY	10.1	7.4

Table VII a. Hit-list of allergens I

ALLERGEN	ALL PAT.	CONTACT D.	ATOPIC D.	HAND D.	LEG D.
NICKEL SULFATE	1	1	1	1	-
PARA-HYDROXYBENZOIC ACID	2	5	-	-	1
PARA-AMINOAZOBENZENE	3	3	3	-	7
BALSAM OF PERU	4	6	10	-	3
TINCTURE OF IODINE	5	7	7	8	8

Table VII b. Hit-list of allergens II

ALLERGEN	ALL PAT.	CONTACT D.	ATOPIC D.	HAND D.	LEG D.
BENZOCAINE	6	-	-	-	2
POTASSIUM DICHROMATE	7	2	8	2	-
BENZOQUINONE	8	-	-	-	-
COBALT CHLORIDE	9	4	2	7	-
WOOD TARS	10	-	4	6	-

caine and the balsam of Peru, all three frequent components in topical therapeutical agents. On the other hand, metals have only a subordinate importance in stasis dermatitis, contrary to the other groups.

In summary, the most important statements are:

1. In atopics, there is no significant difference as compared to the other groups, in the rate of immune response of the delayed type towards contact allergens. The high incidence of contact sensitivity in atopics indicates the necessity to perform patch tests in all these patients.

2. In atopics too, the most important contact allergen was nickel sulphate, with 19.6% in the positive collective and with 7.8% in all tested atopics.

3. There is a partial similarity in the allergen spectrum between atopic dermatitis, contact dermatitis and dyshidrotic hand dermatitis, but essential differences to the allergen spectrum of leg ulcers and stasis dermatitis.

REFERENCES

1. Bandmann H-J. Epicutantesttechnik - Indikation und Auswertung. 114. Tagung der Rheinisch-Westfälischen und Südwestdeutschen Dermatologen, Bad-Godesberg, 23.-25.3.1984.
2. Bandmann H-J, Breit R, Leutgeb C. Kontaktallergie und Dermatitis atopica. Arch Derm Forsch 1972; 244: 332.

3. Kallusky J. Epikutantest-Ergebnisse bei Hautkranken. *Allergologie* (in press, 1984).
4. Malten KE. Nickel-allergic contact dermatitis and atopy. *Dermatologica* 1971; 142: 113.
5. Pürschel W. Dermatologische Klimatherapie an der Nordsee. Klinisch-analytische Untersuchungen am konstitutionellen Ekzematoïd mit/ohne Asthma bronchiale und/oder Rhinitis atopica. *Dermatologica* 1973; 146 (Suppl. 1): 1.
6. Rajka G. Delayed reactivity to bacterial, mold and viral allergens in atopic dermatitis. In: Jadassohn W, Schirren CG, eds. XIII Congr. Intern. Derm. München. Vol. 2. Berlin, Heidelberg, New York: Springer, 1968: 1187.
7. Wahlberg JE, Skog E. Nickel allergy and atopy. Threshold of nickel sensitivity and immunoglobulin E determinations. *Br J Dermatol* 1971; 85: 97.
8. Wüthrich B. Zur Immunpathologie der Neurodermitis constitutionalis. Bern, Stuttgart, Wien: Hans Huber, 1975.

S. Marghescu, *Hautklinik Linden, Ricklingerstr. 5, D-3000 Hannover 91, F.R.G.*