

PATCH TESTING REACTIONS TO A STANDARD SERIES IN AN ITALIAN GENERAL HOSPITAL

E. Nettis, MD (1); M. Marcandrea, MD (1); M.-C. Colanardi, MD (1); Maria Giovanna Priore, MD (1); Pantalea Delle Donne MD (1); Prof. A. Ferrannini, MD (1); Prof. A. Vacca, MD (1)

Patch testing is a useful diagnostic tool when allergic contact dermatitis is suspected on clinical basis. In order to evaluate some contact sensitive patients' characteristics, the results of patch testing with the GIRDCA standard series in 876 consecutive patients were described.

We reviewed our database for data from 2001 to 2002 and selected 876 patients suspected of having contact dermatitis and tested with the GIRDCA standard series.

Forty-seven per cent of the patients tested with the GIRDCA standard series exhibited at least one positive reaction.

The positive patch tests were considered relevant in 321 patients (77.1%). Nickel, paraphenyldiamine, fragrance mix, cobalt chloride, balsam of Peru were the most common allergens. Two or more positive reactions were observed in 14.4% of patients. Concomitant positive reactions to ten pairs of allergens were found to be highly statistically correlated ($p < 0.001$). Women were more likely than men to have positive patch test reactions ($p < 0.001$). We found a significant correlation between females and positivity to nickel, fragrance mix, balsam of Peru and paraphenyldiamine. Occupational allergic contact dermatitis was diagnosed in 184 patients (44.6%), most of them being housewives (53.3%).

The only risk factor for contact sensitivity is female sex, while age and personal atopy are not significantly associated with it. The MOAHLFA index (men-occupational-atopy-hand eczema-leg dermatitis-face dermatitis-age above 40 years) in % was 13.6%-21%-9.9%- 19.9%- 2%- 12.9%- 34.7%.

Key-words: Age - Allergic contact dermatitis - Atopy - GIRDCA - Sex - Standard series.

INTRODUCTION

Although it is more than 100 years since Jadassohn introduced modern patch testing (1-4), this is still the method of choice to establish delayed-type hypersensitivities to common substances.

A standard screening tray is frequently used for the initial patch testing of patients with possible allergic contact dermatitis (ACD).

Most reports on the frequency of positive reactions and on the relative frequency of reactions to different allergens have been reported by clinics with a special interest and expertise in patch testing.

The aim of this study was to report the patch testing experience for 876 consecutive patients with ACD referred to the Department of Medical Clinic, Immunology and Infectious Diseases, Section of Allergy and Clinical Immunology, University of Bari (Italy). Also, an evaluation of some features of individuals with contact hypersensitivity (sex, age, personal atopy) and the concomitant positive reactions to allergens were made.

(1) Department of medical clinic, immunology and infectious diseases, section of allergy and clinical immunology; Department of biomedical sciences and human oncology - University of Bari Medical School - I-70124 Bari (Italy).

MATERIALS AND METHODS

■ **Study group:** This was a retrospective study based on the analysis of data of 876 consecutive patients tested with the haptens of the GIRDCA standard series. These subjects belonged to a 6030 out-patients cohort referred to our Unit for suspected ACD, between January 1, 2001 and December 31, 2002. The study group included 212 males (24.2%) and 664 females (75.8%) aged 13-74 (mean 35.8) years. All patients underwent investigations about atopic status (personal history of allergic asthma, allergic rhinitis and/or atopic dermatitis) and clinical evaluation before patch testing. Atopy was diagnosed on the basis of one or more positive SPT for common inhalant allergens and a clinical history of allergic rhinoconjunctivitis, asthma or eczema dermatitis (5).

■ **Patch testing:** All 876 patients were patch tested with the haptens of the GIRDCA (Italian Group of Research in Environmental and Contact Dermatitis) standard series (table 1), using Finn Chambers (Epitest Limited OY, Tuusula, Finland) and other haptens relevant to the patients' (not shown in this analysis). At the time of testing no patient had been treated with systemic corticosteroids or antihistamines, nor topical corticosteroids had been applied to the test areas for at least one week.

The patch tests were applied onto the subject's back using Scampor tape (Norgesplaster, Vennesla, Norway) and removed after 48 hours. Readings were taken at days 2 and 4. The reactions were evaluated according to the International Contact Dermatitis Research Group (6). Ambiguous or irritant reactions were considered as negative.

On completion of readings at the 4th day, the relevance of each positive result and the relevance of concomitant reactions were assessed in relation to patient's clinical history.

Positive patch tests were considered relevant in the presence of reactions to allergens to which patients were exposed (i.e., in the case of occupational allergic dermatitis the substance found at the workplace and come into contact with patient). The diagnosis of occupational contact dermatitis was established on the basis of the patient's history, physical examination, and patch testing according to previously reported criteria (7).

■ **Clinical records:** Patient's clinical data, information on medical examination, history of atopy, patch test reactions and diagnoses were collected in a database used for this study.

■ **Statistical analysis:** Patients' data were analysed first by EPI INFO 6 statistics software. Detailed statistical analysis was carried out using the SAS software. Frequencies were compared with the χ^2 test and Fisher's exact test (FET) where needed, assuming a probability value < 0.05 as significant.

RESULTS

Of 876 patch tested patients, 412 [56 males (13.6 %) and 356 females (86.4%)] were positive to at least one substance. The positive patch tests were considered relevant in 321 patients (77.9%). In the remaining 91 patients (22.1%) no relevance could be determined.

Allergen	Concentration (%)
Potassium dichromate	0.5
Neomycin sulfate	20
Thiuram mix	1
p-Phenyldiamine (PPD)	1
Cobalt chloride	1
Benzocaine	5
Formaldehyde (Aq)	1
Colophony	20
Clioquinol	5
Balsam of Peru	25
IPPD	0.1
Wool alcohols	30
Mercapto mix	1
Epoxy resin	1
Paraben Mix	16
p-tert-Butylphenol-formaldehyde (PTPF) Resin	1
Fragrance mix	8
Quaternium 15	1
Nickel sulphate	5
Kathon CG (methylchloroisothiazolinone/methylisothiazolinone) (Aq)	0.01
Mercaptobenzothiazole	2
Primin	0.01
Sesquiterpene lactone mix	0.1
Imidazolidinyl urea	2
Thiomersal	0.1
Mercuric chloride	1
Disperse yellow 3	1
Disperse red 1	1
4,4 Diaminodiphenylmethane (DDM)	0.5

Table 1: Standard patch test screening tray (GIRDCA series). All substances in pet unless stated otherwise. Aq: aqueous.

The prevalence of reactions and their relevance is shown in table 2. The most common sensitizers were nickel sulphate (24%), paraphenyldiamine (5.1%), fragrance mix (5.4%), cobalt chloride (3.8%), and balsam of Peru (3.3%). Two hundred and eighteen six patients (69.4%) had 1 positive reaction. Two or more positive reactions were observed in 126 patients (14.4%): 2, 3, and 4 positive tests were recorded in 96 (23.3% of patch positive patients), 23 (5.6%), and 7 (1.7%), respectively. The most commonly associated positive reactions were nickel sulphate and cobalt chloride which occurred in 26 patients and were relevant in 25 of them (96%). A statistically significant sex difference in the prevalence of contact sensitivity was observed: 26.4% males vs. 53.6% females ($p < 0.01$). A breakdown of

patch test results by sex is shown in table 3. 52/71 (73.2%) positive tests in males correlated with clinical history; in females this proportion was 435/504 (86.3%) were correlated with history. We found a significant association between female sex and positivity to nickel, fragrance mix, balsam of Peru and paraphenyldiamine.

■ **Age:** If patients were grouped by age, 229 (26.1%) and 647 (73.9%) were ≤ 25 and > 25 years old, respectively. Forty nine were under 14 years-old according to Castiglioni *et al.* (8); on the basis of these data, age was not a risk factor for contact sensitivity ($\chi^2=0.040$; $p=0.842$). Furthermore only 20 children (2.3%) were positive on patch tests.

Allergen	Total No.	Relevance No.	*Localization of eczema (No. of Patients)
Nickel sulphate	231	210	Face (22); Neck (19); Trunk (47); Hands (41); Wrists (42); Forearms (35); Legs (2); Generalized (23)
P-Phenyldiamine	51	45	Legs (1) Neck (7); Hands (16); Wrists (13); Forearms (14)
Fragrance mix	48	47	Legs (1) Neck (13); Trunk (16); Forearms (9); Face (9)
Cobalt chloride	42	33	Legs (2) Neck (5); Trunk (7); Hands (7); Wrists (6); Forearms (7); Face (6); Generalized (2)
Balsam of Peru	31	29	Trunk (16); Hands (5); Forearms (9); Face (1)
Thiomersal	23	16	Trunk (16); Forearms (4) Face (3)
IPPD	20	8	Neck (3); Hands (1); Wrists (7); Forearms (8); Face (1)
4,4 Diaminodiphenylmethane	20	15	Trunk (3); Hands (3); Wrists (7); Forearms (6); Face (1)
Potassium dichromate	14	10	Trunk (4); Hands (3); Wrists (1); Legs (2); Face (4)
Thiuram mix	14	8	Hands (3); Wrists (5); Forearms (4); Face (2)
Kathon CG	13	11	Trunk (7); Forearms (6)
Colophony	10	9	Trunk (3); Wrists (3); Forearms (4)
Wool alcohols	9	7	Trunk (5); Forearms (4)
Mercuric chloride	9	7	Neck (2); Trunk (3); Forearms (4)
Neomycin sulphate	9	9	Trunk (6); Face (3)
Epoxy resin	7	4	Trunk (3); Forearms (4)
p-tert-Butylphenol-Formaldehyde	5	5	Wrists (3); Forearms (2)
Disperse Yellow 3	4	1	Trunk (2); Forearms (1); Face (1)
Formaldehyde	3	3	Wrists (3)
Mercapto mix	3	2	Wrists (2); Forearms (1)
Primin	3	2	Hands (2); Neck (1)
Mercaptobenzothiazole	2	1	Hands (1); Wrists (1)
Sesquiterpene lactone mix	2	2	Trunk (2)
Disperse Red 1	2	1	Trunk (2)
Clioquinol	0	0	
Paraben mix	0	0	
Imidazolidinyl urea	0	0	
Benzocaine	0	0	
Quaternium 15	0	0	
Total	575	485	

Table 2: Positive patch tests, their clinical relevance and localization of dermatitis in 876 subjects.

*Localization of eczema regards only the 412 positive subjects.

Allergen	Males (n= 212)		Females (n= 664)		Total (n= 876)		p-Value**
	No.	r	No.	r	No.	r	
Potassium dichromate	4	3	10	7	14	10	NS
Thiuram mix	4	2	10	6	14	8	NS
Cobalt chloride	9	7	33	26	42	33	NS
IPPD	7	4	13	4	17	8	NS
Fragrance mix	6	5	42	42	48	47	< 0.05
Nickel sulphate	13	9	218	201	231	210	< 0.01*
Thiomersal	4	2	19	14	23	16	NS
Paraphenyldiamine	6	5	45	40	51	45	< 0.05
Balsam of Peru	3	3	28	26	31	29	< 0.05
Kathon CG	3	2	10	9	13	11	NS
4,4 diaminodiphenylmethane	4	2	16	13	20	15	NS

Table 3: Patch test responses by sex in 876 subjects and their clinical relevance (r).

NS= Not Significant.

* p-Value calculated with χ^2 test, other-wise Fisher's exact test was used.

** based on patch test positivities.

Allergen	Age $\leq$ 25 (n=229)		Age > 25 (n = 647)		Total (n= 876)		p-Value**
	No.	r	No.	r	No.	r	
Potassium dichromate	4	2	10	8	14	10	NS
Thiuram mix	4	4	10	4	14	8	NS
Cobalt chloride	15	11	27	22	42	33	NS
IPPD	4	2	16	6	20	8	NS
Fragrance mix	8	8	40	39	48	47	NS
Nickel sulphate	62	51	169	159	231	210	NS*
Thiomersal	8	6	15	10	23	16	NS
Paraphenyldiamine	14	13	37	32	51	45	NS
Balsam of Peru	3	2	28	27	31	29	< 0.05
Kathon CG	3	3	10	8	13	11	NS
4,4 Diaminodiphenylmethane	1	1	19	14	20	15	< 0.05

Table 4: Patch test responses by age in 876 subjects and their clinical relevance (r).

NS=Not Significant.

* p-Value calculated with χ^2 test, other-wise Fisher's exact test was used.

** based on patch test positivities.

Allergen	Atopics (n=142)		non atopics		Total (n= 876)		p-Value**
	No.	r	No.	r	No.	r	
Potassium dichromate	4	4	10	6	14	10	NS
Thiuram mix	4	3	10	5	14	8	NS
Cobalt chloride	8	7	34	26	42	33	NS
IPPD	1	1	19	7	20	8	NS
Fragrance mix	8	7	40	40	48	47	NS
Nickel sulphate	45	39	186	171	231	210	NS*
Thiomersal	5	4	18	12	23	16	NS
Paraphenyldiamine	6	5	45	40	51	45	NS
Balsam of Peru	6	6	25	23	31	29	NS
Kathon CG	6	5	7	6	13	11	< 0.01
4,4 diaminodiphenylmethane	1	1	19	14	20	15	NS

Table 5: Patch test responses by personal atopy in 876 subjects and their clinical relevance (r).

NS= Not Significant.

* p-Value calculated with χ^2 test, other-wise Fisher's exact test was used.

** based on patch test positivities.

A breakdown of patch test results by age is shown in table 4; two compounds tested determined a statistically significant difference in the frequency of positive reactions between the two age groups; 4,4 diaminodiphenylmethane and balsam of Peru which were more frequently positive in patients >25 years ($p < 0.05$).

■ **Atopy:** 87/412 (21.2%) patients with contact sensitivity vs 77/464 (16.6%) without contact sensitivity were atopic. An overview of patch test results by personal atopy is listed in table 5. There was no statistically difference in the total of contact sensitisation between atopics and non atopics ($\chi^2=2.865$; $p=0.091$). However, contact sensitivity to Kathon GC was significantly higher among atopics ($p<0.01$). Among atopic patients positive on patch tests, 72 (17.5%) had only mucosal atopy, 11 (2.7%) had only atopic dermatitis and 4 (1%) had both mucosal atopy and atopic dermatitis. There was not statistically difference in the total contact sensitization between mucosal atopy (MA) and atopic dermatitis (AD) ($\chi^2=0.12$; $p = 0.72$).

■ **Occupational ACD:** Occupational ACD was diagnosed in 184 patients (44.6%), most of them being housewives (53.3%) who showed relevant sensitisation to nickel sulphate and fragrance mix. Hairdressers and nurses followed. Hairdressers were most frequently sensitized to paraphenyldiamine whereas nickel sulphate and cobalt were the most common occupational allergens for nurses.

■ **Localization:** The dermatitis was mainly localized on hands (44.2%), followed by face (27.4%) and neck (9.7%). The most frequent clinically relevant allergen on these sites was nickel sulphate. The MOAHLFA index (men-occupational-atopy-hand eczema-leg dermatitis-face dermatitis-age above 40 years) (9) in % was 13.6%-21%-9.9%- 19.9%- 2%-12.9%- 34.7%. The localization of eczema according to the different positive reactions is shown in Table 2. Tables 3, 4, and 5 only considered the most common sensitizers in order to find more significant results.

DISCUSSION

In keeping with the literature (8,10-13), our study showed a higher prevalence of contact sensitivity in females. For some allergens, such as nickel sulphate and fragrance mix, it seems plausible that a higher exposure contributes to the higher frequency of allergic reactions. For other allergens this explanation might not hold true, and it was hypothesized that women are more susceptible to contact sensitisation. Although various studies have shown that sexual hormones may have an influence on the immune system

(14,15), other studies could not confirm a sex-related difference in susceptibility (16).

Nickel sulphate was the most common allergen in our study (26.4%), reflecting the worldwide prevalence (9, 17-20). Nickel allergy was observed significantly more frequently among women vs. men (32.83% vs. 6.13%, $p < 0.001$), and this finding too confirms previous study (9,17,18). The high nickel sensitivity rate among women is explained not by occupational exposure, but also by early ear piercing and contact with other jewellery (21).

It is generally accepted that hand eczema in a nickel-sensitive housewife is not due to detergents because nickel levels in these products are too low to induce it. However nickel sensitivity is reported as occupational due to daily contacts with detergents and nickel devices. In keeping with Angelini *et al* (22), one could suggest that detergents themselves, friction and skin maceration alter the hydrolipidic film leading to increased permeability to this hapten.

In the present study the proportion of patients hypersensitive to paraphenyldiamine was about 6%. This percentage is similar to sensitization rates observed in Germany (9), but is higher than those found in China, Canada and England (23-27). This finding might be due, at least in part, to frequent contacts with dyes and rubber gloves which contain paraphenyldiamine. In fact, sensitisation was significantly associated with female sex and is this chemical a common occupational sensitizer. In addition, the high percentage in our study might depend on cross-sensitization with 4,4 diaminodiphenylmethane, even if the number of relevant concomitant reactions between these two allergens seems to suggest a co-sensitization rather than a cross-sensitization (both are rubber chemicals).

Fragrance mix is one of the most frequently positive allergens in the European standard series, and in many countries it rates second after nickel sulphate. It is considered a good marker of fragrance allergy (28); the prevalence of positive patch test reactions range worldwide from 5% to 14% (29). Similarly to our study, previous studies reported a higher prevalence of fragrance sensitivity among women than among man. This might depend on the more extensive use of scented cosmetics and toiletries by women. Although other studies seem to indicate a rising trend in fragrance allergy (18, 29, 30) in our series the proportion of positive reactions is comparatively low, possibly due to the introduction of fragrance free preparations. In line with previous larger studies (31) sensitivity to fragrance mix and balsam of Peru (a mixture of plant resins including also cinnamic alcohol, cinnamic aldehyde, eugenol and isoeugenol) were strongly associated ($p=0.001$). This fact is due to common components in the two substances; Balsam of Peru has been

considered as a marker of fragrance mix sensitivity in about 50% of patients (32). In this study, all concomitant reactions to these allergens were relevant. Cobalt sensitivity ranked 4th in our study. The percentage of patch positivities (4.8%) was similar to other studies (7, 18, 23, 33). Generally, cobalt sensitization is related to the presence of this substance in cement; in fact, it is frequent in countries where the construction industry is flourishing. However, in our series cobalt sensitisation was more frequent among female patients, probably because women are more frequently in contact with metal instruments made of various combinations of metals such as nickel, cobalt, potassium bichromate (34). As all these metals belong to the same group (VIII) of the periodic table a cross-reactions by T-cell clones has been postulated. However, cross-sensitization between palladium and nickel (35-37) but not between nickel and cobalt has been ascertained.

Contact sensitivity has been considered uncommon in children based upon the reduced exposure to contact allergens in childhood and the possibility that the children's immune system may be less susceptible to contact allergens (38, 39). Furthermore, several authors assumed that most positive reactions in children were irritant (40).

However, during the last 10-20 years, several reports described a considerable number of children with contact sensitivity and ACD (41-44) confirming that these conditions are not infrequent in children and might represent a relevant clinical problem. Our data apparently do not confirm these findings international literature, probably because children with suspect ACD are referred to Paediatric Clinics.

A contact sensitisation rate in atopics has been reported up to 57%. In keeping with others (45) we found that contact sensitivity was more frequent among non atopics than atopics even if the difference was not statistically significant. This finding is probably due to the fact that atopic subjects show a heightened tendency to produce IgE antibodies, but with a reduced ability to produce a delayed type IV response.

A careful evaluation of data shows that positive patch testing to occupational allergens such as thiuram, or cobalt, is rare among patients with atopic dermatitis (data not shown) probably because they are aware of their cutaneous vulnerability and consequently avoid occupations in which there are frequent contacts with irritants and allergens.

Acknowledgements: The authors wish to thank Dr. Giovanni FM Strippoli for his collaboration.

References

1. Fischer T., Maibach H.-I. - Improved, but not perfect, patch testing. *Am J Contact Dermatitis* 1990;1:73-90.
2. Fousereau J. - History of epicutaneous testing. The blotting paper and other methods. *Contact Dermatitis* 1984;11:219-23.
3. Lachapelle J.-M. - First Jadassohn lecture: a century of patch testing. Paper given at the Jadassohn Conference in London, October 1996.
4. Wahlberg J.-E. - Patch testing. In: Textbook of contact dermatitis. 2nd edition. Berlin, Heidelberg, New York: Springer, 1995;pp 239-68.
5. Cronin E. - Contact dermatitis. Edinburgh, London and New York: Churchill Livingstone, 1980.
6. Johansson SGO., Hourihane JOB., Bousquet J. *et al.* - A revised nomenclature for allergy. An EAACI position statement from the EAACI nomenclature task force. *Allergy* 2001; 56: 813-24.
7. Nettis E., Colanardi M.-C., Soccio A.-L. *et al.* - Occupational irritant and allergic contact dermatitis among healthcare workers. *Contact Dermatitis* 2002;46:101-7.
8. Castiglioni G., Carrosso A., Manzoni S. *et al.* - Results of routine patch testing of 834 patients in Turin. *Contact Dermatitis* 1992;27:182-5.
9. Schnuch A., Geier J., Uter W. *et al.* - National rates and regional differences in sensitization to allergens of the standard series. *Contact Dermatitis* 1997;37:200-9.
10. Schubert H., Berova N., Hegyi E. *et al.* - Das allergische Kontaktekzem-Analyse einer Stichprobe in fünf soziaastischen Ländern Europas. *Dermatol Monatsschr* 1982;168:613-23.
11. Meding B., Swanbeck G. - Occupational hand eczema in an industrial city. *Contact Dermatitis* 1990;22:13-23.
12. Lantiga H., Nater J., Coenraass P. - Prevalence, incidence and course of eczema on hands and forearms in a sample of the general population. *Contact Dermatitis* 1984;10:135-9.
13. Kavli G., Forde O. - Hand dermatoses in Tromsø. *Contact Dermatitis* 1984;10:174-7.
14. Paavonen T., Andersson L.-C., Adlercreutz H. - Sex hormone regulation *in vitro* immune response. Exradiol enhances human B cells maturation via inhibition of suppressor T cell in pokeweed mitogen stimulated cultures. *J Exp Med* 1988;154:1935-45.
15. Stites D.-P., Bugbee S., Siiteri P.-K. - Differential actions of progesterone and cortisol on lymphocyte and monocyte interaction during lymphocyte activation-relevance to immunosuppression in pregnancy. *J Reprod Immunol* 1983;5:215-28.
16. Leyden J., Kligman A. - Allergic contact dermatitis: sex differences. *Contact Dermatitis* 1977;3:333-6.
17. Christophersen J., Menné T., Tanghøj K. *et al.* - Clinical patch test data evaluated by multivariate analysis. *Contact Dermatitis* 1989;21:291-9.
18. Lim JTE., Goh CL., No SK, *et al.* Changing trends in the epidemiology of contact dermatitis in Singapore. *Contact Dermatitis* 1992, 26:321-6.
19. Marks JG., Belsito D.-V., De Leo V.-A. *et al.* - North America Contact Dermatitis Group patch test results for the detection of delayed-type hypersensitivity to topical allergens. *J Am Acad Dermatol* 1998;38: 911-8.
20. Young E., Houwing R.-H. - Patch test results with standard allergens over a decade. *Contact Dermatitis* 1987;17:104-7.
21. Nakada T., Iijima M., Nakayama H. *et al.* - Role of ear piercing in metal allergic contact dermatitis. *Contact Dermatitis* 1997;36:233-6.
22. Angelini G., Vena G.-A. - Allergia da contatto al nichel. Considerazioni su vecchi e nuove acquisizioni. *Boll Dermatol Allerg Profes* 1989;4:5-29.
23. Shehade S.-A., Beck M.-H., Hiller V.-F. - Epidemiological survey of standard series patch test results and observations on day 2 and 4 readings. *Contact Dermatitis* 1991;24:119-22.
24. Hogan D.-J., Hill M., Lane P.-R. - Results of routine patch testing of 542 patients in Saskatoon, Canada. *Contact Dermatitis* 1988;19:120-4.
25. Gupta G., Dawn G., Forsyth A. - The trend of allergic contact dermatitis in the elderly population over a 15-year period. *Contact Dermatitis* 1999;41:48-50.

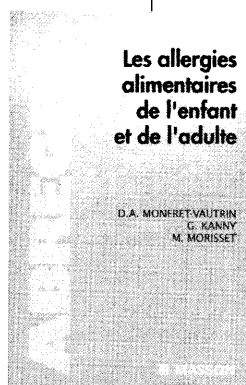
26. Lee T.-Y., Lam T.-H. - Patch testing of 490 patients in Hong Kong. *Contact Dermatitis* 1996;35:23-6.
27. Wang X.-M., Lin Y.-F., Cheng X.-F. *et al.* - Patch testing with the European standard series in Shanghai. *Contact Dermatitis* 1994;30:173-4.
28. De Groot A.-C., Frosh P. - Adverse reactions to fragrances. *Contact Dermatitis* 1997;36:57-66.
29. Lunder T., Kanski A. - Increase in contact allergy to fragrances: patch test results 1989-1998. *Contact Dermatitis* 2000;43:107-9.
30. Johansen J.-D., Mennè T. The fragrance mix and its constituents: a 14-year material. *Contact Dermatitis* 1995;32:18-23.
31. Edman B. - Computerized analysis of concomitant contact allergens. *Contact Dermatitis* 1991;24:110-3.
32. Angelini G., Vena G.-A., Giglio G. - Contact dermatitis due to cosmetics. *J Appl Cosmetol* 1985;3:223-36.
33. Monk B.-E. - Patch testing in a British district general hospital. *Clin Exp Dermatology* 1999;24:484-6.
34. Andersen K.-E., Burrows D., White I.-R. - Allergens from standard series. In: Rycroft RJG, Mennè T, Frosch PJ (eds): *Textbook of contact dermatitis*, 2nd edition. Berlin: Springer Verlag, 1995;pp 416-58.
35. Sinigaglia F. - The molecular basis to metal recognition by T cells. *J Invest Dermatol* 1994;102:398-401.
36. Wahlberg L.-E., Boman A.-S. - Cross-reactivity to palladium and nickel studied in the guinea pig. *Acta Derm Venereol Suppl* (Stockh) 1992;72:95-7.
37. Pistor F.-H., Kapsenberg M.-L., Bos J.-D. *et al.* - Cross-reactivity of human nickel-reactive T-lymphocyte clones with copper and palladium. *J Invest Dermatol* 1995;105:92-5.
38. Mortz C.-G., Bindslev-Jensen C., Lauritsen J.-M. *et al.* - Allergic contact sensitization in 8th grade school children in Odense, Denmark. Abstract book, ESCD, London, 1996:9.
39. Epstein W.-L. - Contact-type delayed hypersensitivity in infants and children: introduction of rush sensitivity. *Pediatrics* 1961;27:51-3.
40. Hjorth N. - Contact dermatitis in children. *Acta Derm Venereol* 1981;95:36-9.
41. Ayala F., Balato N., Lembo G. *et al.* - A multicentre study of contact sensitization in children. Gruppo Italiano Ricerca Dermatiti da Contatto e Ambientali (GIRDCA). *Contact Dermatitis* 1992;26:307-10.
42. Goncalo S., Goncalo M., Azenha A. *et al.* - Allergic contact dermatitis in children. A multicenter study of Portuguese Contact Dermatitis Group (GPEDC). *Contact Dermatitis* 1992;26:112-5.
43. Rudzki E., Rebandel P. - Contact dermatitis in children. *Contact Dermatitis* 1996;34:66-7.
44. Stables G.-I., Forsyth A., Lever R.-S. - Patch testing in children. *Contact Dermatitis* 1996;34:341-4.
45. De Groot A.-C. - The frequency of contact allergy in atopic patients with dermatitis. *Contact Dermatitis* 1990;22:273-7.



LES ALLERGIES ALIMENTAIRES DE L'ENFANT ET DE L'ADULTE (The food allergies of the child and the adult)

D.A. Moneret-Vautrin, G. Kanny, M. Morisset

Editions : Masson



Depuis 25 ans, la prévalence des allergies alimentaires a augmenté de façon saisissante. Et cette pathologie constitue souvent le premier pas dans la vie d'un allergique.

En effet, négligées, elles ouvrent la voie à la polysensibilisation aux allergènes atmosphériques, à l'asthme, aux rhinites allergiques, aux accidents anaphylactiques sérieux, voire à des asthmes aigus graves.

Le dépistage des allergies alimentaires dépend en premier lieu de l'expertise clinique du praticien. Aussi cet ouvrage, après avoir rappelé les données de base – définitions, mécanismes, épidémiologie... – en donne toutes les clés : fréquences des allergènes, tableaux cliniques, données de l'interrogatoire, enquête alimentaire, tests allergologiques. Sont également expliquées de manière synthétique et très pratique les conduites thérapeutiques et préventives ainsi que les stratégies actuelles de surveillance du risque allergique alimentaire et les thérapeutiques du futur.