Patch test standard series recommended by the Brazilian Contact Dermatitis Study Group during the 2006-2011 period*

Bateria de testes padrão preconizada pelo Grupo Brasileiro de Estudos em Dermatite de Contato: período de 2006 a 2011

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Abstract: A retrospective study was carried out between 2006-2011. Six hundred and eighteen patients with suspected allergic contact dermatitis underwent the standard patch test series recommended by the Brazilian Contact Dermatitis Research Group. The aim of our study was to evaluate the variation of positive patch-test results from standard series year by year. The most frequently positive allergens were: nickel sulfate, thimerosal and potassium bichromate. Decrease of positive patch-test results over the years was statistically significant for: lanolin (p=0.01), neomycin (p=0.01) and anthraquinone (p=0.04). A follow-up study should be useful in determining which allergens could be excluded from standard series, as they may represent low sensitization risk.
Keywords: Allergens; Dermatitis, allergic contact; Dermatitis, contact; Patch tests; Skin tests

Resumo: Estudo retrospectivo foi realizado entre 2006 e 2011 em 618 pacientes com hipótese diagnóstica de dermatite de contato submetidos à bateria padrão de testes de contato preconizada pelo Grupo Brasileiro de Estudos em Dermatite de Contato com o objetivo de avaliar a variação, a cada ano, da frequência de positividade para as substâncias da bateria. Os principais sensibilizantes foram sulfato de níquel, timerosal e bicromato de potássio. As substâncias com diminuição da frequência de sensibilização estatisticamente significante foram lanolina (p = 0,01), neomicina (p = 0,01) e antraquinona (p = 0,04). A continuação deste trabalho poderá contribuir para verificar aqueles componentes que poderão ser eliminados da bateria, por representarem pouco risco de sensibilização.
Palavras-chave: Alérgenos; Dermatite alérgica de contato; Dermatite de contato; Testes cutâneos; Testes do emplastro

Patch tests are used to confirm the diagnosis and investigate the etiology of allergic contact dermatitis (ACD).

A retrospective study was carried out at the Allergy and Phototherapy Sector of the Dermatology Clinic of Santa Casa de São Paulo, in the period from January 2006 to December 2011, with 618 patients with diagnostic hypothesis of ACD. The patients underwent the standard epicutaneous patch series recommended by the Brazilian Contact Dermatitis Research Group (Grupo Brasileiro de Estudos em Dermatite de Contato - GBEDC).[1]

The objective of the study was to evaluate the frequency variation of positive test results for substances present in the mentioned standard series, year by year, during the period studied.

The epicutaneous tests, manufactured by FDA Allergenic (Rio de Janeiro, Brazil) were applied to the

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back of the patients by means of FINN Chambers pads (Epitest Ltd, Oy, Finland). The reading was done 96 hours after application in order to avoid doubts about sensitization, as positive tests with intensity marked by two or three crosses were considered. The statistical analysis of data was done using the correlation test of Pearson (CP), considering data with $p<0.05$ as having statistical significance.

There was predominance of the female gender in all of the studied years, totalling 195 men and 423 women. The predominant age group was the 30-49 years and 170 positive tests (17.6%) were related to the professions of the patients.

The main ACD sites were the cephalic segment (45.3%), followed by upper limbs (39%), hands (35.6%), lower limbs (28.64%), feet (20.71%) and torso (15.86%).

The total number of positive tests every year varied from 90 to 220, totaling 966 in the studied period. The positive test/patient variation was between 0.98 and 2.47 during the analyzed years.

The substances that presented higher positivity were: nickel sulphate (28.16%), thimerosal (16.02%), potassium dichromate (11.17%), cobalt chloride (10.52%), fragrance mix (8.74%), carba mix (7.28%), neomycin (7.28%), paraphenylenediamin (6.96%), PPD-mix (6.63%) and thiuram-mix (6.15%). The remaining substances were positive in less than 5% of cases (Table 1).

Studies carried out in other communities and already published have shown that the main sensitizers were the same obtained in this investigation.[1-6] Nevertheless, differences were observed in the sensitization rates for some of the substances tested. The nickel sulphate sensitization rate, for example, was 28.16% and frequency varied between 10.4% and 19%,[7-10] in European and American publications. In several communities there are regulations regarding the limit of nickel release from items that may get into prolonged and direct contact with the skin, which contributed to the low sensitization rates.

Thimerosal, despite having been removed from several topical preparations, had a higher sensitization rate than that referred in other studies.[2-6] This is due to its presence in preparations like vaccines, contact lenses solutions and tattoo ink, which favors the contact of the population with this substance.

The other sensitizers presented similar frequencies to those observed in other publications.[1-6]

Table 2 shows the variation, year by year, of standard series substance positivity. Some substances presented similar frequencies for the entire period studied, while others varied every year. Most of the substances presented a discrete tendency for the number of positive tests to decrease along the period. Three substances presented a diminished statistically significant sensitization rate: Lanolin ($p=0.01$), Neomycin ($p=0.01$), Anthraquinone ($p=0.04$).

Table 1: Sensitization rate of standard series substances - 618 patients - 2006-2011

Substance	Total positive tests	%
Nickel sulphate	174	28.16
Thimerosal	99	16.02
Potassium dichromate	69	11.17
Cobalt Chloride	65	10.52
Fragrance mix	54	8.74
Carba mix	45	7.28
Neomycin	45	7.28
Paraphenylenediamin	43	6.96
PPD mix	41	6.63
Thiuram mix	38	6.15
Ethylenediamine	27	4.37
Promethazine	21	3.40
Formaldehyde	20	3.24
Mercaptobenzothiazole	20	3.24
Balsam of Peru	20	3.24
Parabens	19	3.07
Hydroquinone	19	3.07
Colophony	17	2.75
Lanolin	16	2.59
Quaternium 15	16	2.59
Kathon CG	15	2.43
Benzocaine	15	2.43
Nitrofurazone	14	2.27
Turpentine	11	1.78
Quinoline mix	10	1.62
Propylene glycol	10	1.62
Epoxi resin	9	1.46
P-tertiary Buthylphenol	5	0.81
Irgasan	5	0.81
Anthraquinone	4	0.65
TOTAL PATIENTS	**618**	

Table 2: Sensitization rate of standard series substances per year - from 2006 to 2011

	2006 (n=89)	2007 (n=100)	2008 (n=113)	2009 (n=126)	2010 (n=98)	2011 (n=92)	TOTAL (n=618)	Pearson's correlation
Nickel Sulphate	24	27	34	43	23	24	175	-0.1 (p=0.8)
Thimerosal	25	6	17	22	18	11	99	-0.3 (p=0.5)
Potassium Dichromate	19	13	7	14	10	6	69	-0.7 (p=0.1)
Cobalt Chloride	15	5	10	14	11	11	66	-0.1 (p=0.8)
Fragrance mix	6	2	13	10	7	8	56	0.4 (p=0.3)
Carba mix	18	5	5	7	6	5	46	-0.6 (p=0.1)
Neomycin	14	12	6	8	5	0	45	-0.9 (p=0.01)
Paraphenylenediamin	4	10	4	9	8	7	42	0.3 (p=0.5)
PPD mix	18	1	12	3	6	1	41	-0.6 (p=0.1)
Thiuram mix	16	3	1	6	9	4	39	-0.4 (p=0.4)
Ethylenediamine	4	4	2	9	5	3	27	0.1 (p=0.3)
Promethazine	2	6	2	6	3	3	22	-0.3 (p=0.4)
Formaldehyde	7	3	4	2	6	1	23	-0.4 (p=0.3)
Mercaptobenzothiazole	7	3	3	1	6	1	21	-0.5 (p=0.3)
Balsam of Peru	2	0	3	8	1	3	17	0.1 (p=0.7)
Parabens	3	3	7	1	8	2	24	0.9 (p=0.8)
Hydroquinone	7	1	0	4	7	0	19	-0.2 (p=0.6)
Colophony	4	1	3	5	3	1	17	-0.9 (p=0.01)
Lanolin	4	3	3	5	1	1	17	-0.3 (p=0.4)
Quaternium 15	7	1	2	2	4	0	16	-0.5 (p=0.2)
Kathon CG	0	1	1	1	9	2	14	0.2 (p=0.6)
Benzocaine	3	0	1	6	3	3	16	0.5 (p=0.2)
Nitrofurazone	3	1	1	5	4	0	14	-0.09 (p=0.8)
Turpentine	2	0	2	6	1	0	11	-0.1 (p=0.7)
Quinoline mix	0	2	0	0	1	1	4	0.0 (p=1.0)
Propylene glycol	2	2	5	3	1	2	15	0.1 (p=0.7)
Epoxi resin	0	3	1	4	2	1	11	-0.3 (p=0.4)
P-tertiary Buthylphenol	2	0	1	0	1	1	5	-0.3 (p=0.8)
Irgasan	1	1	0	0	3	0	5	0.04 (p=0.4)
Anthraquinone	1	1	1	1	0	0	4	-0.8 (p=0.04)
TOTAL POSITIVE TESTS	**220**	**120**	**151**	**205**	**182**	**102**	**980**	

It is concluded that the standard patch test series was relatively uniform for studied years and only three substances had statistically significant decrease in positivity.

Nevertheless, the number of positive tests for each substance was small, so that the continuation of this investigation might contribute to the evaluation of the main sensitizers in the population studied and also verify which components might be eliminated from the series for presenting ever lower sensitization rates, representing a low risk for ACD. ❑

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