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Comparison of skin prick test and a serological panel test for the determination of specific IgE antibodies

Joachim Zehender, Nicole Schüller, Ingrid Frank*, Peter Nickel**
R-Biopharm AG, Darmstadt, *Labor Dr. Tiller & Kollegen, **Pfungstadt

Introduction

When diagnosing a suspected allergy the determination of specific IgE is performed as the third step after anamneses and a skin prick test (SPT). For the detection of a sensitization the current single allergen test systems are both laborious and expensive.

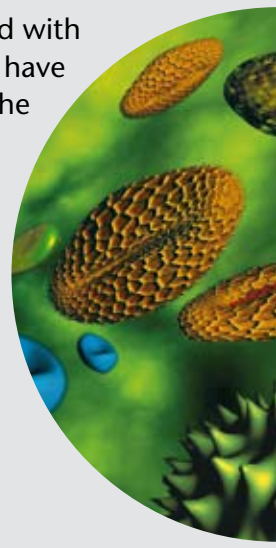
As the prevalence of allergic disease has increased dramatically in the recent years sytems which save both time and cost have become more and more important, provided that the results are comparable to current assays.

The intention of this study was to test a new method for allergy in-vitro diagnostics in comparison to both to a commercially available system (CAP-system) and allergy-in-vivo diagnostics (SPT).

A selection of different allergens from various allergen groups were tested with different sera and the concordance of the results of Immunocap 1000 (Pharmacia) and RIDA® AllergyScreen were compared to the results of SPT.

Methods

27 sera were tested with RIDA AllergyScreen Panel 2 and 3 and with the CAP System of Pharmacia. Due to the fact that not all sera have been tested with the CAP system for all allergens present on the AllergyScreen panels and that not all probands have been tested with the SPT the number of analyzable tests varies from allergen to allergen. For this study only allergens were taken into account where at least 10 test results were available. The results in RAST class of Immunocap 1000 are given only in integral numbers.
For this reason, the results of AllergyScreen (given normaly with one decimal), are rounded according to allergologic convention.



Results

D2	Ph pos	Ph neg	total
SPT pos	3	1	4
SPT neg	2	4	6
Total	5	5	**70 %**

E1	Ph pos	Ph neg	total
SPT pos	6	1	7
SPT neg	0	4	4
Total	6	5	**91 %**

E5	Ph pos	Ph neg	total
SPT pos	2	4	6
SPT neg	0	6	6
Total	2	10	**67 %**

F31	Ph pos	Ph neg	total
SPT pos	4	2	6
SPT neg	2	4	6
Total	6	6	**67 %**

G12	Ph pos	Ph neg	total
SPT pos	9	1	10
SPT neg	1	2	3
Total	10	3	**85 %**

T2	Ph pos	Ph neg	total
SPT pos	8	2	10
SPT neg	1	2	3
Total	9	4	**77 %**

T3	Ph pos	Ph neg	total
SPT pos	7	3	10
SPT neg	2	1	3
Total	9	4	**62 %**

T4	Ph pos	Ph neg	total
SPT pos	8	3	11
SPT neg	1	1	2
Total	9	4	**69 %**

Total	Ph pos	Ph neg	total
SPT pos	**47**	**17**	**64**
SPT neg	**9**	**24**	**33**
Total	**56**	**41**	**73 %**

D2	AS pos	AS neg	total
SPT pos	4	1	5
SPT neg	3	3	6
Total	7	4	**64 %**

E1	AS pos	AS neg	total
SPT pos	8	1	9
SPT neg	0	4	4
Total	8	5	**92 %**

E5	AS pos	AS neg	total
SPT pos	3	2	5
SPT neg	1	6	6
Total	4	7	**73 %**

F31	AS pos	AS neg	total
SPT pos	5	1	6
SPT neg	1	4	5
Total	6	5	**82 %**

G12	AS pos	AS neg	total
SPT pos	11	1	12
SPT neg	1	3	4
Total	12	4	**88 %**

GX	AS pos	AS neg	total
SPT pos	11	0	11
SPT neg	1	0	1
Total	12	0	**92 %**

T2	AS pos	AS neg	total
SPT pos	10	2	12
SPT neg	2	3	5
Total	12	5	**76 %**

T3	AS pos	AS neg	total
SPT pos	10	3	13
SPT neg	3	1	4
Total	13	4	**65 %**

T4	AS pos	AS neg	total
SPT pos	12	2	14
SPT neg	2	2	4
Total	14	4	**78 %**

W6	AS pos	AS neg	total
SPT pos	4	2	6
SPT neg	2	2	4
Total	6	4	**60 %**

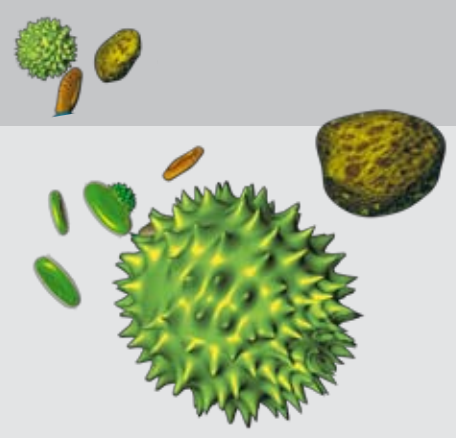
Total	AS pos	AS neg	total
SPT pos	**78**	**15**	**93**
SPT neg	**16**	**27**	**43**
Total	**94**	**42**	**77 %**

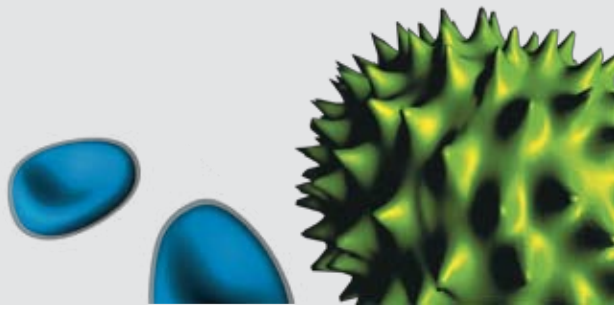
ImmunoCap versus SPT

Sensitivity	73,9 %
Specificity	70,3 %
Concordance	73 %

AllergyScreen versus SPT

Sensitivity	83,9 %
Specificity	62,8 %
Concordance	77 %





Discussion

The aim of this study was to validate a simple, favorable and fast system for the determination of specific IgE as a frontline screening system for allergy diagnostics. After the anamneses the next step in the allergy diagnostics is usually the skin prick test. But in several cases the determination of the specific IgE should be performed instead of the SPT. These cases include the allergy diagnostics with reduced fitness of the patients, with skin disease or irritations like neurodermatitis, eczema or urticaria, with a suspicion of a high-grade sensitization to the allergens , with infants and many more. Due to the high number of allergens (up to 20) which can be tested in one run more than 90 % of the allergenic noxa are covered and particularly with regard to the amount of serum needed for the determination of the 20 allergens this panel test is an ideal tool for the allergy diagnostics in the pediatrics since only 250 µl of serum is required.

Since the concordance of the RIDA® AllergyScreen with the SPT is slightly higher in comparison to the Immunocap system with the RIDA® AllergyScreen a system is available which is able to detect a sensitization against the most important allergens in a fast and reliable way.

R-Biopharm AG
Landwehrstrasse 54, 64293 Darmstadt, Germany
Telefon: +49 61 51 - 81 02-0, Fax: +49 61 51 - 81 02-40
www.r-biopharm.com, E-Mail: info@r-biopharm.de