Allergen-specific IgE-values to inhalant and food allergens – Comparison between two commercial immunoassays: Dr. Fooke ALLERG-O-LIQ versus Pharmacia CAP-System

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Purpose of the Study

Comparison of two in vitro assays for the detection of allergen-specific IgE (sIgE) (Dr. Fooke ALLERG-O-LIQ, Neuss, Germany, www.fooke-labs.de; Pharmacia CAP-System, Upsala, Sweden, www.pharmacia.com) re-analyzing sera with sIgE to common inhalatans and food allergens.

	Dr. Fooke Allerg-O-LIQ	Pharmacia CAP-System
Test principle	fluid phase reversed enzyme-immuno-assay (R-EAST)	solid phase fluorescence-enzyme-immuno-assay (FEIA)
Allergens	fluid phase allergens	solid phase allergens
Test procedure	1. IgE binds to anti-IgE 2. Allergen binds to sIgE	1. sIgE binds to allergen 2. Anti-IgE binds to sIgE
Markers	biotinylated allergens	β-galactosidase coupled anti-IgE
Detection	Photometry	fluorophotometry
Units	kU/l	kU/l
Classes	0 - 6	0 - 6

table 1

Materials und Methods

Allergens: Inhalants: birch t3, timothy g6, mugwort w6, cat dander e1, dog dander e5, housedust mite *D. pter.* d1; food allergens (FA): hen´s egg f1, cow´s milk f2, wheat flour f4, soy bean f14, hazelnut f17, apple f49

Patients sera: Sera from allergic patients (children, adolescents, adults) were collected from different hospitals and re-estimated for sIgE. Clinical data were not evaluated.

Performance: sIgE was measured in single runs according to the recommendations of the manufacturers. Assay features and methodological differences are listed in table 1.

Calculation: Associations between quantitative sIgE-levels of different assays were calculated using non-parametric Spearman-Ranktest (table 2) and depicted with log scales (fig. 1 and 2). Semiquantitative classes are marked as dashed lined (fig. 1 and 2). Concordance per allergen was calculated (see table 2), using following formula:

1) Concordance (%) = (# of identical results)/(# of all results per allergen)
2) Concordance (±1 class) (%) = (# of identical and by ±1 class differing results)/(# of all results per allergen)

		IgE quantitative [kU/l]		IgE semi-quantitative [class]	
allergen source	Code	Spearman´s rho	p	concordance [%]	concordance (±1 class)[%]
birch	t3	0.95	<0.001	69	98
timothy	g6	0.90	<0.001	55	96
mugwort	w6	0.82	<0.001	54	100
D. pter.	d1	0.85	<0.001	46	92
cat	e1	0.87	<0.001	75	93
dog	e5	0.82	<0.001	52	95
hen´s egg	f1	0.84	<0.001	41	86
cow´s milk	f2	0.60	<0.001	29	79
wheat	f4	0.60	<0.001	35	72
soy	f14	0.31	<0.05	25	73
hazelnut	f17	0.68	<0.001	35	90
apple	f49	0.82	<0.001	50	93

table 2

Results

1. Quantitative values of both systems are associated to different degrees, depending on the specific inhalant allergen (table 2, figure 1): birch > grass > cat > D. pter. > mugwort = dog.
2. Quantitative data of sIgE to FA showed less marked associations (table 2, figure 2): hen´s egg > apple > hazelnut > cow´s milk = wheat > soy.
3. Concordance of semi-quantitative sIgE-levels to inhalants, expressed in classes, was moderate (table 2), but better than between sIgE to food allergens. Considering results with variations of ±1 class, concordance was better for inhalants (> 90%) than for FA (70 to 80%, table 2).

Comments

Values of sIgE to inhalants detected by different in vitro methods show better correlation than sIgE to FA.

Allergens with one dominant major allergen (i.e. t3, e1) seem to be less difficult than complex allergen mixtures (i.e. d1).

Identical units (kU/l) are no guarantee for equivalent sIgE results.

The data presented do not allow estimates of the true sIgE concentrations or judgement on superiority of one of the tests over the other.

Conclusions:

Comparative studies are necessary and helpful to define the concordance of sIgE-values detected by different immunoassays.

Lack of concordance (complex allergen mixtures > simple allergens; FA > inhalants) should prompt subsequent improvement of allergens used in test systems detecting specific IgE.

Support: Dr. Fooke Laboratories GmbH, Mainstr. 85, 41469 Neuss, Germany

fig. 1

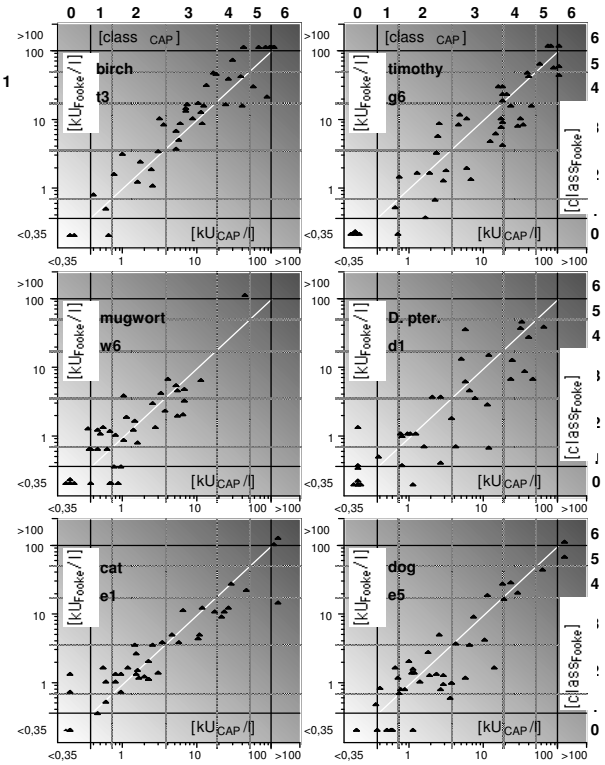

fig. 2