알레르기질환 검사법 이유를 알아야 백전 백승!!

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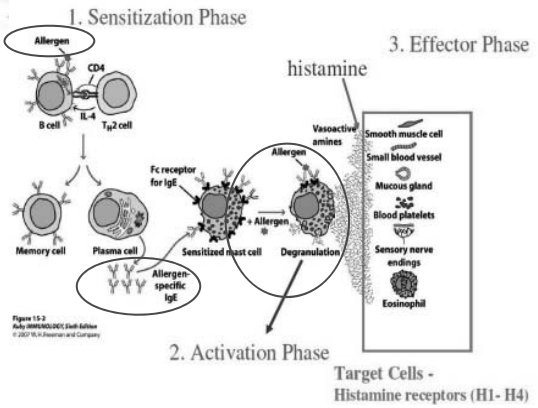
용어의 정리

- **Allergy**
  - allos + ergon (changed+ action)
  - Immunologically determined clinical reaction to an identified substance or allergen
- **Atopy**
  - predisposition toward developing certain allergic hypersensitivity reactions

Allergic reaction



알레르기 질환의 진단

어떠한 알레르기 질환인가?	원인항원 검사
▪ 병력 청취 ▪ 신체진찰	▪ 특이 IgE 검사 (in vitro test) ✓ CAP ✓ MAST ✓ RAST ▪ 피부반응검사 (in vivo test) ✓ 피부단자검사 (Skin prick test) ✓ 피내검사 (intradermal test) ✓ 첩포검사 (patch test)

혈청 특이 IgE 항체 검사

- **Singleplex :**
  - 개별 정량, 특이도, 민감도, 재현성 높음, 많은 혈액이 필요
  - **ImmunoCAP**
  - Immulite
- **Multiplex:**
  - 반정량, 민감도 낮음, 특이도 높음. 수십 종의 항원을 동시에. 선별검사
  - **MAST** CLA
  - Advansure Allergy Screen
  - RIDA Allergy Screen
  - Polycheck Allergy

Serum specific IgE vs. Skin prick test

	혈청 특이 IgE	피부 단자 시험
위험성	없다	있다 (아나필락시스)
약물의 영향	없다	있다 (항히스타민제, 장기간의 스테로이드제)
피부상태의 영향	없다	있다
검사의 편리성	편하다	불편
결과 확인	장시간 후	즉시
비용	비교적 비싸다	비교적 싸다
민감도	높음	아주 높음
다양한 알레르겐	제한된 개수	다양
영향인자		나이, 알레르겐 노출된 정도, 숙련정도, 피부묘기증, 시약의 보존상태

ImmunoCAP

- 보험가능: 항원특이적 면역글로불린E 검사는 6종류 → 12종류 (2016.9~)
- **만 6세 미만의 소아**나 정신적 또는 신체적 장애가 있어 **협조가 곤란**한 환자
- 심한 피부묘기증, 건피증, 전신성 습진 등의 **광범위한 피부질환**이 있어 피부단자검사가 불가능한 경우
- 피부단자검사 결과에 영향을 미치는 **약물을 장기 투여**하고 있으며 일시 중단을 할 수 없는 경우
- **피부단자검사시 아나필락시스의 위험**이 있는 경우

SPT vs. sslgE

Population (n, age, location)	Primary diagnosis	Testing method (SPT, sslgE cutoff)	Allergen extracts tested and number of participants in whom both tests were performed (n)*	Number of total positive tests (SPT+ or IgE+ or both+)	SPT+/ sslgE- (n)	SPT+/ sslgE- (%)	SPT-/ sslgE+(n)	SPT-/ sslgE+(%)	SPT+/ sslgE+(n)	SPT+/ sslgE+(%)
n=40, 1.5–3 years (US)	AS	SPT: ComforTen, sslgE: IL	Grass (37)	18	3	17 %	6	33 %	9	50 %
			Ragweed (36)	6	1	17 %	2	33 %	3	50 %
			Dust mite (40)	26	6	23 %	7	27 %	13	50 %
			Cockroach (40)	29	7	24 %	6	21 %	16	55 %
			Mouse (40)	29	5	17 %	4	14 %	20	69 %
			Cat (40)	26	2	8 %	7	27 %	17	65 %
			Dog (29)	21	3	14 %	10	48 %	8	38 %
n=45, 14–43 years (Spain)	AS (all BPT pos.)	SPT: SP (Alk-Lancet); sslgE: IC	*Alternaria*	45	2	4 %	0	0 %	43	96 %
n=33, 0.6–18 years (US)	EoE, 70 % AS	SPT: Sharp-Test applicators (Panatrex); sslgE: IC	Dust mite (18)	9	2	22 %	1	11 %	6	67 %
			Cat (15)	10	2	20 %	3	30 %	5	50 %
			Dog (13)	11	0	0 %	8	73 %	3	27 %
			Mold (16)	12	1	8 %	8	67 %	3	25 %
			Tree (18)	11	2	18 %	2	18 %	7	64 %
			Grass (19)	9	2	22 %	2	22 %	5	56 %
			Weeds (14)	8	2	25 %	3	38 %	3	38 %
			Ragweed (12)	6	3	50 %	3	50 %	0	0 %

Curr Allergy Asthma Rep (2014) 14:430

Sensitized participants

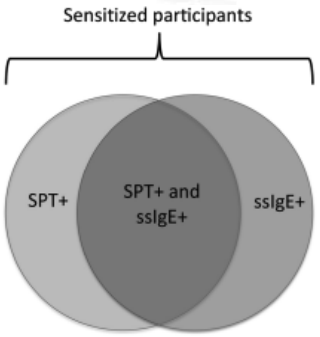


Fig. 1 Graphic presentation of "sensitized study participants" as defined in this article

Curr Allergy Asthma Rep (2014) 14:430

Multiplex vs. SPT

Table 5. Sensitivity and specificity of each multiple allergen simultaneous test compared with skin prick test

Allergen	Polycheck Allergy		MAST CLA		Allergy Screen	
	Sensitivity	Specificity	Sensitivity	Specificity	Sensitivity	Specificity
Milk (n=99)	0.0 (0/1)*	93.9 (92/98)	0.0 (0/1)	92.9 (91/98)	0.0 (0/1)	73.5 (72/98)
Egg White (n=99)	- (0/0)	96.0 (95/99)	- (0/0)	88.9 (88/99)	- (0/0)	96.0 (95/99)
Crab (n=59)	100.0 (2/2)	100.0 (57/57)	100.0 (2/2)	93.0 (53/57)	100.0 (2/2)	96.5 (55/57)
Shrimp (n=59)	33.3 (1/3)	98.2 (55/56)	33.3 (1/3)	92.9 (52/56)	33.3 (1/3)	98.2 (55/56)
Peach (n=59)	- (0/0)	94.9 (56/59)	- (0/0)	94.9 (56/59)	- (0/0)	98.3 (58/59)
D. pteronyssinus (n=100)	95.3 (81/85)	93.3 (14/15)	91.8 (78/85)	100.0 (15/15)	96.5 (82/85)	100.0 (15/15)
D. farinae (n=100)	97.6 (82/84)	75.0 (13/16)	100.0 (84/84)	81.3 (13/16)	94.0 (79/84)	93.8 (15/16)
Cockroach mix (n=100)	0.0 (0/2)	88.8 (87/98)	0.0 (0/2)	92.9 (91/98)	50.0 (1/2)	92.9 (91/98)
Dog (n=100)	62.5 (5/8)	80.4 (74/92)	87.5 (7/8)	93.5 (86/92)	87.5 (7/8)	77.2 (71/92)
Cat (n=100)	100.0 (12/12)	81.5 (72/88)	83.3 (10/12)	100.0 (88/88)	75.0 (9/12)	94.3 (83/88)
Alternaria (n=99)	83.3 (5/6)	93.5 (87/93)	0.0 (0/6)	98.9 (92/93)	100.0 (6/6)	79.6 (74/93)
Birch (n=99)	90.0 (9/10)	89.9 (80/89)	40.0 (4/10)	100.0 (89/89)	90.0 (9/10)	84.3 (75/89)
Ragweed (n=95)	0.0 (0/1)	96.8 (91/94)	0.0 (0/1)	97.9 (92/94)	0.0 (0/1)	87.2 (82/94)
Mugwort (n=99)	50.0 (3/6)	100.0 (93/93)	66.7 (4/6)	92.5 (86/93)	50.0 (3/6)	98.9 (92/93)
Cultivated Rye (n=95)	- (0/0)	96.8 (92/95)	- (0/0)	97.9 (93/95)	- (0/0)	94.7 (90/95)
Timothy grass (n=88)	- (0/0)	96.6 (85/88)	- (0/0)	97.7 (86/88)	- (0/0)	84.1 (74/88)
R.Thistle (n=40)	- (0/0)	82.5 (33/40)	- (0/0)	95.0 (38/40)	- (0/0)	80.0 (32/40)
Ash mix (n=92)	0.0 (0/1)	100.0 (91/91)	0.0 (0/1)	97.8 (89/91)	0.0 (0/1)	95.6 (87/91)
Acacia (n=40)	- (0/0)	100.0 (40/40)	42.9 (3/7)	97.5 (39/40)	- (0/0)	90.0 (36/40)
Hazelnut (n=92)	100.0 (7/7)	89.4 (76/85)	22.2 (2/9)	100.0 (85/85)	42.9 (3/7)	95.2 (80/84)
Oak, White (n=93)	22.2 (2/9)	100.0 (84/84)	- (0/0)	98.8 (83/84)	66.7 (6/9)	91.6 (76/83)
Cocksfoot (n=88)	- (0/0)	98.9 (87/88)	- (0/0)	97.7 (86/88)	- (0/0)	93.2 (82/88)
Aspergillus (n=95)	- (0/0)	94.7 (90/95)	- (0/0)	98.9 (94/95)	- (0/0)	95.8 (91/95)
Cladosporium (n=95)	- (0/0)	97.9 (93/95)	- (0/0)	100.0 (95/95)	- (0/0)	80.0 (76/95)
Penicillium (n=66)	- (0/0)	97.0 (64/66)	- (0/0)	100.0 (66/66)	- (0/0)	78.8 (52/66)
Mean	55.6	93.5	44.5	96.0	59.1	90.0

*% (no. of positive results/no. tested).

Korean J Lab Med 2009;29:465-72

Food allergen (CAP vs. Multiplex)

Table 3. Diagnostic Agreement between the Two Assays (Sensitivity and Specificity)

Allergens	Positive patients, n (%)		Total agreement ratio	*p* value*	Kappa index	*p* value†
	ImmunoCAP	AlloScreen				
D. pteronyssinus	37 (53.6)	38 (55.1)	0.93	<0.001	0.85	<0.001
D. farinae	106 (64.6)	109 (66.5)	0.92	<0.001	0.83	<0.001
Cat dander	29 (47.5)	32 (52.5)	0.95	<0.001	0.90	<0.001
Dog dander	35 (50.7)	32 (46.4)	0.87	<0.001	0.74	<0.001
Alternaria	26 (42.6)	24 (39.3)	0.97	<0.001	0.93	<0.001
Birch	40 (57.1)	47 (67.1)	0.81	<0.001	0.61	<0.001
Oak	30 (49.2)	20 (32.8)	0.74	<0.001	0.47	<0.001
Ragweed	38 (52.8)	25 (34.7)	0.79	<0.001	0.59	<0.001
Mugwort	31 (51.7)	20 (33.3)	0.82	<0.001	0.64	<0.001
Rye grass	35 (53.8)	23 (35.4)	0.78	<0.001	0.58	<0.001
Egg white	34 (44.7)	21 (27.6)	0.78	<0.001	0.53	<0.001
Cow's milk	36 (52.2)	27 (39.1)	0.75	<0.001	0.51	<0.001
Peanuts	31 (51.7)	14 (21.9)	0.87	<0.001	0.74	<0.001

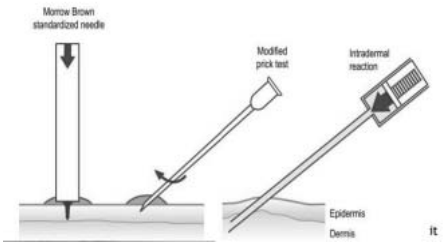
D. farinae, *Dermatophagoides farinae*; *D. pteronyssinus*, *Dermatophagoides pteronyssinus*.
p values were calculated using *Pearson's chi-square test, †Cohen's kappa analysis.

Yonsei Med J 2017 Jul;58(4):786-792

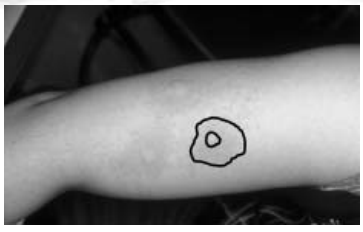
Skin test

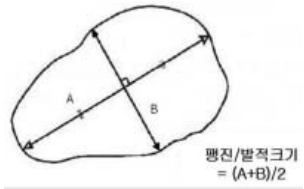
- In vivo test
- Type 1 hypersensitivity (skin prick test, intradermal test, scratch test)
- Type 4 hypersensitivity (patch test)

피부반응검사 (prick/intradermal method)



피부단자시험의 판독





✓ 팽진 (wheal)과 발적 (erythema) 의 크기 (장경과 단경)를 mm 로 측정

✓ 직각을 이룬 장경과 단경을 측정하여 평균값을 계산

피부단자시험의 판독

등 급	전통방법		알레르겐/히스타민	
	팽진 (wheal)	발적(flare)	팽진 (wheal)	발적 (flare)
음성	0	0	0	0
1+	1≤W<3mm	<21mm	R<1	<21mm
2+	1≤W<3mm	≥21mm	R<1	≥21mm
3+	3≤W<5mm	≥21mm	1≤R<2	≥21mm
4+	>5mm	≥21mm	2≤R<3	≥21mm
5+	-	-	3≤R<4	≥21mm
6+			R≥4	≥21mm

Korean Journal of Pediatrics Vol. 50, No. 5, 2007

피부시험에 영향을 주는 인자

- 검사 부위:
  - 등 (상부, 중간부 >하부) > 전박
  - 전박 (척골부위) > (요골부위)
  - 손목관절 5cm 이내, 팔 오금부위 3cm 이내 시행치 않음
- 연령
  - 협조가 가능한 연령
  - 15-25세: 최고점
  - 50세 이후: 반응도 감소
- 계절
- 식품항원은 흡입항원보다 덜 예민 (식품으로 단자시험)

피부단자시험의 결과해석

- **위음성 반응**
  - 부정확한 검사방법
  - 항원의 질 (보관: 반드시 4 ℃에서 냉장보관/ 알레르겐 농도)
  - Local allergy (피부 과민증은 없을 때)
  - 약물 복용
  - 전신질환

피부시험에 영향을 주는 약물

Drug	Suppression		
	Degree	Duration (days)	Clinical Significance
Anti-H_1 Histamine			
Azelastine	++++	30-60	Yes
Cetirizine	++++	3-10	Yes
Chlorpheniramine	++	1-3	Yes
Clemastine	+++	1-10	Yes
Diphenhydramine	0−+	1-3	Yes
Doxepin	++	3-11	Yes
Ebastin	++++	3-10	Yes
Hydroxyzine	+++	1-10	Yes
Levocabastine	Possible		Yes
Loratadine	++++	3-10	Yes
Mequitazine	++++	3-10	Yes
Terfenadine	++++	3-10	Yes
Anti-H_2 Histamine			
Cimetidine	0−+		No
Ranitidine	+		No

Drug	Suppression		
	Degree	Duration (days)	Clinical Significance
Ketotifen	++++	>5	Yes
Imipramines	++++	>10	Yes
Phenothiazine	++		Yes
Corticosteroids			
Systemic, short term	0		
Systemic, long term	Possible		Yes
Topical skin	0−++		Yes
Theophylline	0−+		No
β_2-Agonists			
Inhaled	0−+		No
Oral, injection	0−++		No
Formoterol	Unknown		Possible
Salmeterol	Unknown		Possible
Dopamine	+		
Clonidine	++		
Specific immunotherapy	0−++		No

- 대부분의 antihistamine: 대부분 3-10days, steroid: 장기간
- 영향없음: LTRA, H_2 blocker, 단기간 steroid

Korean Journal of Pediatrics Vol. 50, No. 5, 2007

피부단자시험 양성의 의미

- 일반인의 15-50% 가 양성.
- 질환의 유무 (X), 감작의 유무 (O)
- 무증상 환자에서 향후 알레르기 관련 증상 생길 가능성: 30-60%
- 위양성
  - 적절치 못한 술기
  - 인접한 강양성 항원
  - 피부묘기증
  - 검사액의 불순물
- 식품알레르기 항원 양성의 경우 실질적 섭취시 무반응 (50%)

알레르기질환의 원인 물질 확인

- 환자의 나이
- 환경
- 거주지역
- 직업과의 상관성 (제빵사 천식, 수의사, 과수원 농부)
- 악화인자: 애완동물, 특히 환경, 계절
- 최근 복용한 약제, 건강식품 종류

증 례 1

8개월 남아

특이병력 없음

이전에 모유 수유하다가 **분유 섭취 후 1시간 후 두드러기** 발생

출생 직후 조리원에서 잠깐 분유섭취 하였다가 처음 먹어 봄.

가족력: 음성

- 검사를 해야 되나??
- Cap vs. MAST
- 해석은??

유발시험없이 식품알레르기 진단이 가능한 수치

	혈청 IgE (kU/L)		Predictive Level (%)
Milk	≤2yr	**≥ 5**	95
	>2yr	**≥ 15**	94
Egg	≤2yr	**≥ 2**	94
	>2yr	**≥ 7**	98
Soybean		**≥ 30**	73
Wheat		**≥ 26**	74
Peanut		**≥ 15**	95
Tree nuts		**~15**	~95
Fish		**20**	100

J Allergy Clin Immunol 2004;113:805-19

검사의 판독 (milk)

Table 2. Positive predictive values of cow milk-specific IgE titers reported from various studies

Year	Reporter	Country	Number	Prevalence (%)	% of AD	PPV	Age	sIgE titer (kU$_A$/L)
1997	Sampson[1]	US	109	50	All	95% PPV	0.6-17.9 yr	32
2001	Sampson[2]	US	62	66	61	90% specificity (95% PPV)	3 mo-14 yr	15*
2001	Garcia-Ara[14]	Spain	170	44	23	90% PPV 95% PPV	<1 yr <1 yr	2.5 5*
2001	Roehr[40]	Germany	98	41	all	100% PPV (with APT)	2 mo-11.2 yr	0.35
2004	Garcia-Ara[15]	Spain	66	all	unrevealed	90% PPV	13-18 mo 19-24 mo 25-36 mo	1.5 6 14
2005	Celik-Bilgili[9]	Germany	397	49	88	90% PPV	<1 yr 1-16.1 yr	25.8 88.8
2007	Komata[16]	Japan	861	25	74	95% PPV	<1 yr 1 yr ≥2 yr	5.8 38.6 57.3
2015	Kim[8]	Korea	225	23.1	81.3	90% PPV	<2 yr ≥2 yr	31.4 10.1

Allergy Asthma Immunol Res. 2015 July;7(4):309-311

검사의 판독 (Egg)

Table 1. Positive predictive values of egg white-specific IgE titers reported from various studies

Year	Reporter	Country	Number	Prevalence (%)	% of AD	PPV	Age	sIgE titer (kU$_A$/L)
1997	Sampson[1]	US	126	73	All	95% PPV	0.6-17.9 yr	6
2001	**Sampson[2]**	**US**	**75**	**80**	**61**	**90% specificity (95% PPV)**	**3 mo-14 yr**	**7***
2001	Boyano-Martinez[3]	Spain	81	79	43	94% PPV	<2 yr	0.35
2001	Roehr[40]	Germany	98	24	all	100% PPV (with APT)	2 mo-11.2 yr	17.5
2002	**Boyano-Martinez[35]**	**Spain**	**58**	**64**	**50**	**50th percentile of the frequency distribution**	**11-24 mo**	**1.98***
2003	Osterballe[12]	Denmark	56	64	all	95% PPV	<2 yr >2 yr	1.5 1.3
2005	Celik-Bilgili[5]	Germany	227	67	88	95% PPV	<1 yr ≥1 yr	10.9 13.2
2007	Komata[3]	Japan	764	45	74	95% PPV	<1 yr 1 yr ≥2 yr	13.0 23.0 30.0
2008	Ando[13]	Japan	108	62	94	95% PPV	14 mo-13 yr	7.4 (Heated; 30.7)
2015	Kim[4]	Korea	273	19	81.3	95% PPV	<2 yr ≥2 yr	22.9 28.1

Allergy Asthma Immunol Res. 2015 July;7(4):309-311

증 례 2

- **15개월 남아**
- **주소:** 전신 피부에 붉은 발진이 있으면서 긁는다
- **병력:**
  - ✓ 생후 1개월 경부터 얼굴에 가려움을 동반한 발진 발생함
  - ✓ 국소 스테로이드제를 처방 받았으나 사용 안 함
  - ✓ 민간요법 시행함
  - ✓ 먹으면 피부가 다 나빠지는 것 같아서,
    이유식부터 진행안됨. 모유 아직 먹고 있음

(©Skylines/Shutterstock.com)

무엇을 검사할 것인가?? (FA)

- 연령
- 식품 노출력과 증상과의 임상적 연관성
- 교차반응성
- Major food allergens

Table 2. Causes of immediate-type food allergy in Korean children depending on the age groups

	< 2 years	2-6 years	7-12 years	13-18 years
Sample size	1,073	331	76	29
1st	Cow's milk (37.1%)	Walnut (16.6%)	Walnut (13.2%)	Buckwheat (17.2%)
2nd	Hen's egg (34.3%)	Hen's egg (15.4%)	Buckwheat (9.2%)	Wheat (10.3%)
3rd	Wheat (8.3%)	Cow's milk (11.2%)	Peanut (6.6%)	Shrimp (10.3%)
4th	Walnut (4.0%)	Peanut (9.7%)	Wheat (6.6%)	
5th	Peanut (3.7%)	Wheat (8.5%)	Crab (6.6%)	
6th	Soybean (1.8%)	Almond (5.1%)	Apple (6.6%)	
7th	Pine nut (0.9%)	Pine nut (3.6%)	Hen's egg (5.3%)	
8th	Shrimp (0.9%)	Buckwheat, Kiwi (3.0% each)	Shrimp (5.3%)	

<2 years and 2-6 years: causative foods with ≥10 cases were included in this table; 7-12 years and 13-18 years: causative foods with ≥3 cases were included in this table.

Allergy Asthma Immunol Res. 2017 September;9(5):423-430

무엇을 검사할 것인가?? (FA)

Table 2. Prevalence of current immediate-type FA in each age group, according to allergen

6- to 7-year-olds	9- to 10-year-olds	12- to 13-year-olds	15- to 16-year-olds
Individual food (prevalence, %)			
Hen's egg (0.25)	Peanut (0.34)	Cow's milk (0.26)	Buckwheat (0.18)
Peanut (0.22)	Hen's egg (0.32)	Peanut (0.23)	Pork (0.17)
Cow's milk (0.16)	Cow's milk (0.24)	Hen's egg (0.19)	Hen's egg (0.13)
Sesame (0.15)	Buckwheat (0.10)	Buckwheat (0.17)	Peanut (0.13)
Chicken (0.08)	Soy (0.09)	Pork (0.10)	Chicken (0.11)
Wheat (0.06)	Wheat (0.07)	Beef (0.07)	Cow's milk (0.08)
Soy (0.06)	Sesame (0.06)	Soy (0.03)	Soy (0.07)
Beef (0.04)	Pork (0.06)	Chicken (0.01)	Beef (0.04)
Buckwheat (0.03)	Chicken (0.04)	-	Wheat (0.03)
Pork (0.03)	Beef (0.01)	-	Sesame (0.01)
Food group (prevalence, %)			
Fruits (0.75)	Fruits (1.52)	Fruits (1.92)	Fruits (1.39)
Tree nuts (0.36)	Crustaceans (0.89)	Crustaceans (0.77)	Crustaceans (1.25)
Crustaceans (0.34)	Tree nuts (0.47)	Fish (0.44)	Vegetables (0.47)
Vegetables (0.25)	Fish (0.28)	Tree nuts (0.23)	Fish (0.30)
Fish (0.21)	Vegetables (0.24)	Vegetables (0.11)	Tree nuts (0.26)

FA, food allergy.

Allergy Asthma Immunol Res. 2017 September;9(5):410-416.

무엇을 검사할 것인가?? (FA /adult)

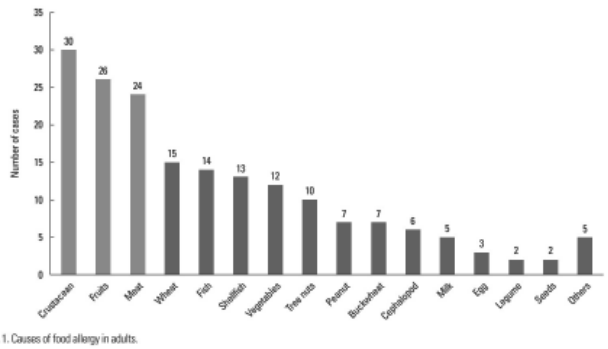


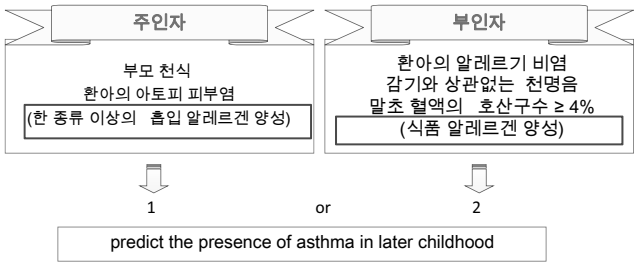
Fig. 1. Causes of food allergy in adults.

Allergy Asthma Immunol Res. 2017 November;9(6):534-539

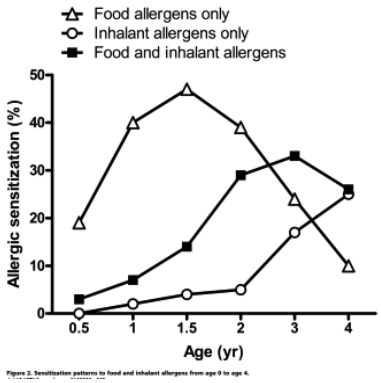
증 례 3

- **2.5살 여아**
- **주소:** 너무 자주 쌕쌕거려요
- **병력:**
  - ✓ 한달 동안 좋아지지 않고 지속된 기침
  - ✓ 밤에는 기침 때문에 잠에서 자주 깬다
  - ✓ 찬 바람을 쐬거나 뛰고 나면 기침이 악화
- **과거력:**
  - ✓ 어릴 때 아토피피부염으로 스테로이드연고 쓴 적 있음
  - ✓ 모세기관지염을 여러 번 앓았음

Modified Asthma Predictive index



무엇을 검사할 것인가?? (atopy)



PLoS One. 2014 Jul 17;9(7):e102809

무엇을 검사할 것인가?? (atopy)

Table 3 Characteristics of sensitisation for different age groups

	3 years (*n* = 83)	4 years (*n* = 164)	5 years (*n* = 202)	6 years (*n* = 85)	*P*-value
Atopy†, %	27 (17–36)	19 (12–24)	25 (19–31)	33 (23–43)	**0.160**
Der p), %	17 (9–25)	15 (10–21)	22 (16–28)	31 (21–41)	**0.008**
Food Allergen, %	10 (3–16)	2 (0–4)	2 (0–3)	2 (0–6)	**0.009**
Pollen Allergen, %	4 (0–8)	7 (3–11)	11 (7–16)	21 (12–30)	**<0.001**
Monosensitisation, %	18 (10–27)	13 (8–18)	14 (10–19)	11 (4–17)	**0.282**
Polysensitisation, %	8 (2–15)	6 (2–10)	10 (6–15)	22 (13–31)	**0.002**
Der p, PPA‡	63	80	88	93	**0.005**

Data are presented as percentage (95% confidence interval). Significant *P*-values ($P < 0.05$) are in bold.
†Atopy was defined as presence of at least one positive skin prick test reaction. ‡Der p, PPA, positive predictive agreement between Der p positivity and atopy, obtained by linear-by-linear association with a χ^2 test.

Journal of Paediatrics and Child Health 49 (2013) 272–277

항원의 선택

Food allergy /Atopic dermatitis	Wheezing /Allergic rhinitis (<3yr)	Wheezing /Allergic rhinitis (3-5yr)
Egg white	***D.pteronyssinus***	***D.pteronyssinus***
Milk	***D.farinae***	***D.farinae***
Wheat	**Egg white**	**Cat dander**
Soy	**Milk**	**Dog dander**
Peanut	**Wheat**	**Tree pollen mixture**
Walnut	**Soy**	Oak
Fish (cod)	**Peanut**	**Grass pollen mixture**
Shrimp	Buckwheat	**Weed pollen mixture**
Buckwheat	Cat dander	Japanese hop, mugwort
Meat mixture	Dog dander	**Mold mix**
D.pteronyssinus	Mold mix	Alternaria
D.farinae	Weed pollen mixture	Cockroach

Allergy Asthma Respir Dis 6(5):237-240

증 례 4

- **30살, 남자**
- **주소: 코감기를 달고 살아요**
- **병력:**
  - ✓ 감기에 걸리면 코증상이 남보다 오래 간다.
  - ✓ **감기에 걸리지 않아도 콧물, 코막힘, 재채기가 자주 있다.**
  - ✓ **4,5월에** 눈과 코 가려움증이 심하다.


알레르기비염의 진단

(서울특별시 아토피 천식 교육정보센터)

검사의 해석

Control

1 Physiological Saline			
2 Histamine	0505 / 3530		

Tree pollens

3 Birch 자작나무	0707 / 3023	3+	
4 Alder 오리나무	0605 / 3520	3+	
5 Hazel 개암나무	0505 / 2015	3+	
6 Ash 물푸레나무	/		
7 Beech 너도밤나무	0604 / 2020	3+	
8 Oak 참나무	0605 / 3020	3+	
9 Willow tree 버드나무	/		
10 Elm 느릅나무	/		
11 Japanese cedar 삼나무	/		
12 Pine 소나무	/		
13 Trees I	0906	2520	3+
14 Trees II	1210 / 5032	4+	

Weed Pollens

15 Mugwort 쑥	/		
16 Ragweed 돼지풀	/		
17 Nettle 돼기풀	0202	1010	1+
18 Hop Japanese 환삼덩굴	0302 / 2020	1+	

Grass Pollens

19 Bermuda grass 우산잔디	0403 / 1010	1+	
20 Meadow grass 왕포아풀	/		
21 Orchard grass 오리새	/		
22 Rye 호밀풀	/		
23 Timothy grass 큰조아재비	/		
24 Maize 옥수수	/		
25 Grasses/Cereals 잔디/곡물	/		

Animal Epithelia and Mites /

26 Cat epithelium	/		
27 Dog epithelium	/		
28 Cow epithelium	/		
29 Rabbit epithelium	/		
30 D. pteronyssinus	/		
31 D. farinae	/		
32 Tyrophagus putrescentiae			
33 Cockroach	/		

Moulds /

34 Alternaria tenuis	/		
35 Aspergillus fumigatus	/		
36 Aspergillus niger	/		
37 Cladosporium herbarum	/		
38 Fusarium moniliforme	/		
39 Penicillium notatum	/		
40 Trichophyton mentagrophytes			
41 Rhizopus nigricans	/		

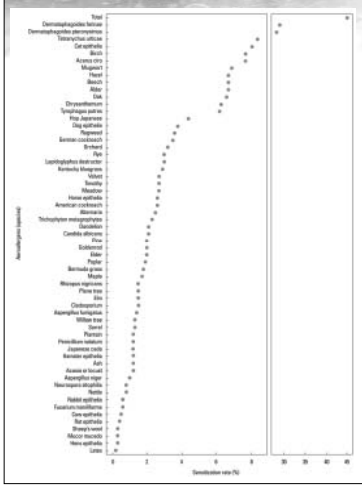
Food allergens /

42 Cod fish 대구	/		
43 Egg 계란	/		
44 Cow's milk 우유	/		
45 Celery 셀러리	0303 / 2010	1+	
46 Carrot 당근	/		
47 Lobster 바다가재	/		
48 Shrimp 새우	/		
49 Oyster 굴	/		
50 Mussel 홍합	/		
51 Pork 돼지고기	/		

Interpretation : 자동

Positive : 3, 4, 5, 7, 8, 13, 14
equivocal(1+ and 2+) : 17, 18, 19, 45

무엇을 검사할 것인가??



- 28,954 adult patients
- 12 allergy clinics
- Skin prick test
- Allergic sensitization: 45.3%

Allergy Asthma Immunol Res. 2017 November;9(6):499-508

Inhalant Allergen Sensitization & Geographical Variation

Table 3. Common inhalant allergen panel according to the residential area

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Overall	Der p	Der f	Cat	Birch	Tetra	Hazel	Alder	Mugwort	Beech	Oak
Seoul	Der f	Der p	Cat	Tetra	Birch	Mugwort	Beech	Oak	Hazel	Alder
Gyeonggi	Der f	Der p	Cat	Birch	Mugwort	Tetra	Chrysan	Tyro	Beech	Oak
Incheon	Der f	Der p	Acarus	Mugwort	Cat	Tyro	G. cock	Birch	Dog	Tricho
Gangwon	Der p	Der f	Birch	Alder	Beech	Hazel	Cat	Mugwort	Oak	Tetra
Chungbuk	Der f	Der p	Tyro	Chrysan	Cat	Beech	Hazel	Alder	Mugwort	Hop J
Chungnam	Der f	Der p	Mugwort	Cat	Tyro	Chrysan	Hop J	A. Cock	Alder	Birch
Gyeongbuk/ Daegu	Der f	Der p	Hazel	Alder	Birtch	Tetra	Cat	Oak	Chrysan	Mugwort
Busan/ Gyeongnam	Der p	Der f	Alder	Birch	Beech	Oak	Hazel	Cat	Pine	Orchard
Jeonbuk	Der p	Der f	Chrysan	Hop J	Tetra	Cat	Beech	Mugwort	Alder	Rye
Jeonnam/ Gwangju	Der p	Der f	Tyro	Hazel	Birch	Oak	Chrysan	Beech	Alder	Cat
Jeju	Der p	Der f	Orchard	Tyro	J. Cedar	Oak	Rye	Tetra	Velvet	Beech

Acarus (Acarus siro), A. cock (American cockroach), Cat (Cat epithelium), Chrysan (Chrysanthemum), Def f (Dermatophagoides farinae), Der P (Dermatophagoides pteronyssinus), Dog (Dog epithelium), G. Cock (German cockroach), Hop J (Hop Japanese), J. cedar (Japanese cedar), Tetra (Tetranychus urticae), Tricho (Trichophyton metagrophytes), Tyro (Tyrophagus putres).

Allergy Asthma Immunol Res. 2017 November;9(6):499-508

주요 흡입 알레르겐

- ✓ 집먼지진드기: *D.pteronyssinus, D.farinae*
- ✓ 나무: birch, oak, alder, hazel
- ✓ 목초: Bermuda, timothy, rye
- ✓ 잡초: mugwort, ragweed, hop Japanese
- ✓ 곰팡이: *Alternaria*, cladosporium, aspergillus, penicillium
- ✓ 동물: Cat, Dog
- ✓ 곤충: Cockroach
- ✓ 지역특성 고려: Japanese cedar (일본삼나무), 귤응애

J Korean Med Assoc 2017 January; 60(1):81-88