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Issue 2

CAPture

A Commentary on Recent Allergy Papers

SYNOPSIS

- Sera from 153 patients were selected an analyzed in parallel in Imunlite 2000 and UniCAP® 100.
- Sera were analyzed for IgE to *ambrosia*, *parietaria*, mite, birch, olive, timothy, cat, *cladosporium*, egg white, wheat and wasp.
- Reproducibility was analyzed in 4 replicates of a positive serum to timothy and a negative serum to egg albumin.
- Linearity was tested by diluting (1/3, 1/9, 1/27,1/81) positive sera to ambrosia, cat, mite, timothy and birch and tested in 4 replicates.
- The analytical comparison were based on 1114 results for UniCAP® 100 and 1009 for Immulite 2000.
- The concentration of 0.35 kU_A/l was accepted as the negative/positive discrimination threshold for both systems.

Citation: Vignati G et al. In Vitro allergy diagnosis: Comparison of a new method of fully automated determination of specific IgE, using Immunlite 2000 compared with UniCAP® 100. Allerg Immunol (Paris) 2003;35(8):285-94.

A high degree of inconsistency between Immulite 2000 and UniCAP® 100 when testing for allergen-specific IgE antibodies

The analytical quality was compared between Immulite 2000 and UniCAP® 100. In the imprecision studies UniCAP® 100 show a low CV, <10%, for both the positive and negative controls whereas the positive controls were markedly high in Immulite 2000 with a CV 23.9%.

A high degree of inconsistency was obtained between the systems even if the overall correlation (r=0.8) between individual test results were acceptable. In Immulite 2000, 31.5% of the measured concentrations were over 50% lower and 14.3% were 50% higher than in UniCAP® 100. Furthermore, 14.3% of UniCAP® positive samples appeared negative in Immulite and 2.6% of Immulite positive samples appeared negative in UniCAP® 100.

The interference by non-specific binding of myeloma IgE was practically negligible in UniCAP® 100 with all tested allergens. In Immulite 2000, a non-specific binding of IgE was found for allergens such as mite, cat and birch.

The systems ability to give correct quantitative values, expressed as linearity, was tested by diluting patient sera. In Immulite 2000 insufficient linearity was obtained for some allergens, such as birch.

In conclusion, the authors stated that the analytical variability appears excessive in Immulite 2000 when used to test for allergen-specific IgE. They also point at the interference by total IgE and that one of five patient sera were different classified in Immulite 2000 with respect to positive or negative result.

SYNOPSIS

- IgE to cross-reactive carbohydrate determinants (CCD) and profilin (rBet v 2) were studied in patients with combined pollinosis (n=24) and isolated allergies to birch (n=33), timothy grass (n=17), house dust mite (n=19), pets (n=7), latex (n=17) and *Hymenoptera* venom (n=40).
- IgE antibodies were measured using ImmunoCAP™, Pharmacia Diagnostics.
- Bromelain was used as marker for CCD and rBet v 2 for profilin.
- Anti-CCD IgE was found in patients with isolated sensitization to timothy (4/17) and venom (7/40).
- Anti-profilin was found in patients with combined pollinosis (5/24) and restricted timothy grass pollinosis (1/17).
- IgE to venom without clinical symptoms were significantly (p=0.003) more common (4/6) in plant-allergic patients with anti-CCD IgE than without (2/38).
- Sensitization to CCD was significantly (p=0.004) more common in patients with anti-apple IgE without (13/31) clinical symptoms than with (6/51).
- Anti-profilin was found in most (19/21) patients with pollen and latex sensitization but not in isolated latex sensitization.

Citation: Ebo DG et al. Sensitization to cross-reactive carbohydrate determinants and the ubiquitous protein profilin: mimickers of allergy. Clin Exp Allergy 2004;34:137-144.

Importance to measure IgE antibodies to profilin and CCD in patients with broad cross reactive IgE profiles

In this study, anti-CCD IgE was found in isolated timothy sensitization and *Hymenoptera* sensitization but not in patients with isolated birch, latex, mite or pet sensitization. Sensitization to Bet v 2 was mainly found in combined pollinosis but not in isolated sensitization to birch, latex or *Hymenoptera*.

Sensitization to Bet v 1 was restricted to patients with birch pollinosis and not in isolated grass pollinosis or latex allergy.

Hymenoptera venom sensitization without clinical symptoms were more common in plant-allergic patients with anti-CCD IgE than in plant-allergic patients without. Furthermore, sensitization to CCD was also more common in patients with anti-apple IgE without clinical symptoms than in sensitized patients with symptoms. In plant-allergic patients with anti-latex IgE most patients had anti-CCD and/or anti-rBet-v 2 IgE whereas non of patients with isolated latex allergy had these antibodies.

This study confirm that sensitization to profilin and CCD display a broad spectrum of cross-reactivity and point at the importance to measure these antibodies when broad cross reactivity is present. Furthermore it shows that IgE antibodies against CCD generally originates from grass or *Hymenoptera* venom.

SYNOPSIS

- Parents' (655 families) atopic history, serum total IgE and allergen-specific IgE were correlated (third trimester) to cord blood IgE in new-born babies as well as to total serum IgE and atopic eczema in 6-month infants.
- Atopic eczema was defined according to Sampson HA (*Clin Exp Allergy 1990;20:459-67*).
- Total serum IgE and allergen-specific IgE antibodies were determined by Pharmacia CAP System™.
- A low range IgE detecting system was used to detect cord blood IgE levels. Cut off point for elevated IgE was set at 0.5 kU/l (80^{th} percentile).
- Elevated total serum IgE levels in parents was set to 150 kU/l based on the 80^{th} percentiles of the study population.
- Elevated IgE in 6-month-old infants was defined to 40 kU/l based on the 80^{th} percentile of the studied population.
- Multivariate analysis was assessed by logistic regression.

Citation: Liu CA et al. Prenatal prediction of infant atopy by maternal but not paternal total IgE levels. J Allergy Clin Immunol 2003;112(5):899-904.

Increased maternal total serum IgE have a high specificity to predict atopic eczema in 6-month old infants

The aim of the present study was to identify factors other than parental atopic history to predict atopic eczema in 6-month-old infants. Using multivariate logistic regression analysis, only babies from mothers with elevated IgE (OR 3.3, p<0.001) or presence of specific IgE (OR 1.9, p=0.006) had a significantly higher relative risk of elevated cord blood IgE. Parents atopic history or paternal IgE measurements, did not show a significant risk for elevated cord blood.

However, in univariate analysis a significantly (p<0.001) higher frequency of elevated cord blood levels was shown in babies from mothers with atopic history. A significant negative (p<0.001) correlation was found between fathers with atopic disease and elevated cord blood IgE levels indicating other unknown confounding factors.

Maternal total serum IgE showed a significant relative risk for elevated total serum IgE (OR 2.5; p=0.008) and eczema (OR 2.6; p=0.022) in 6-month-old infants. Parents' atopic history, paternal IgE measurements or breast feeding more than 2 months did not showed a significant increased risk.

The authors concluded that elevation of maternal total IgE levels have a high specificity (83%) for prediction of eczema whereas the sensitivity (34%) was similar to other predictive markers.

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