



Quantitative Specific IgE

Eva Sjö Dahl, November 28, 2001

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Reasons to know the quantitative specific IgE levels

- Common allergic disorders develop into severe conditions later in life
- Many conditions mistakenly believed to be IgE-related are incorrectly treated
 - Identifying the offending allergen is essential for avoidance
 - Quantification is the tool to pick out the most probable



The clinical utility of quantitative specific IgE values

Developing allergy

- *The presence of even low levels of IgE antibodies suggest an ongoing sensitization and formation of antibodies of other specificities.*
- *In the small child, elevated egg-IgE antibody levels are associated with significantly elevated risk of developing inhalant allergies later in childhood.*



The clinical utility of quantitative specific IgE values

Suspected food allergy

- *In food allergy, IgE antibody levels have been derived indicating 95% positive and 90% negative predictive value for a clinical reaction at certain clinical conditions.*
- *Food IgE antibodies can also be used to predict which food allergies are resolving spontaneously.*
- *Low levels indicate a small, but still a risk, to develop symptoms to food exposure.*

Yunginger JW et al., J Allergy Clin Immunol 2000; 105: 1077-84
Ahlstedt S, Clin Exp Allergy (in press)

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The clinical utility of quantitative specific IgE values

Suspected inhalant allergy

- *In cases of inhalant allergy, specific IgE antibody levels correlate closely with results of inhalation challenge studies in cat-sensitive persons.*
- *High levels of IgE antibodies to inhalant allergens indicate a high probability that clinical symptoms are associated with exposure to that particular allergen and allergic disease.*
- *Low levels indicate a low probability to develop symptoms and allergic disease associated with that particular allergen.*

Yunginger JW et al., J Allergy Clin Immunol 2000; 105: 1077-84
Ahlstedt S, Clin Exp Allergy (in press)

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Probability × Consequence = Risk

- As some allergens can have severe consequences, even low values associated with low likelihood of symptoms need to be considered.
- In the case of sensitization to allergens such as peanut, latex or drugs that can cause anaphylaxis, any IgE antibody level represents a risk and should be regarded seriously.

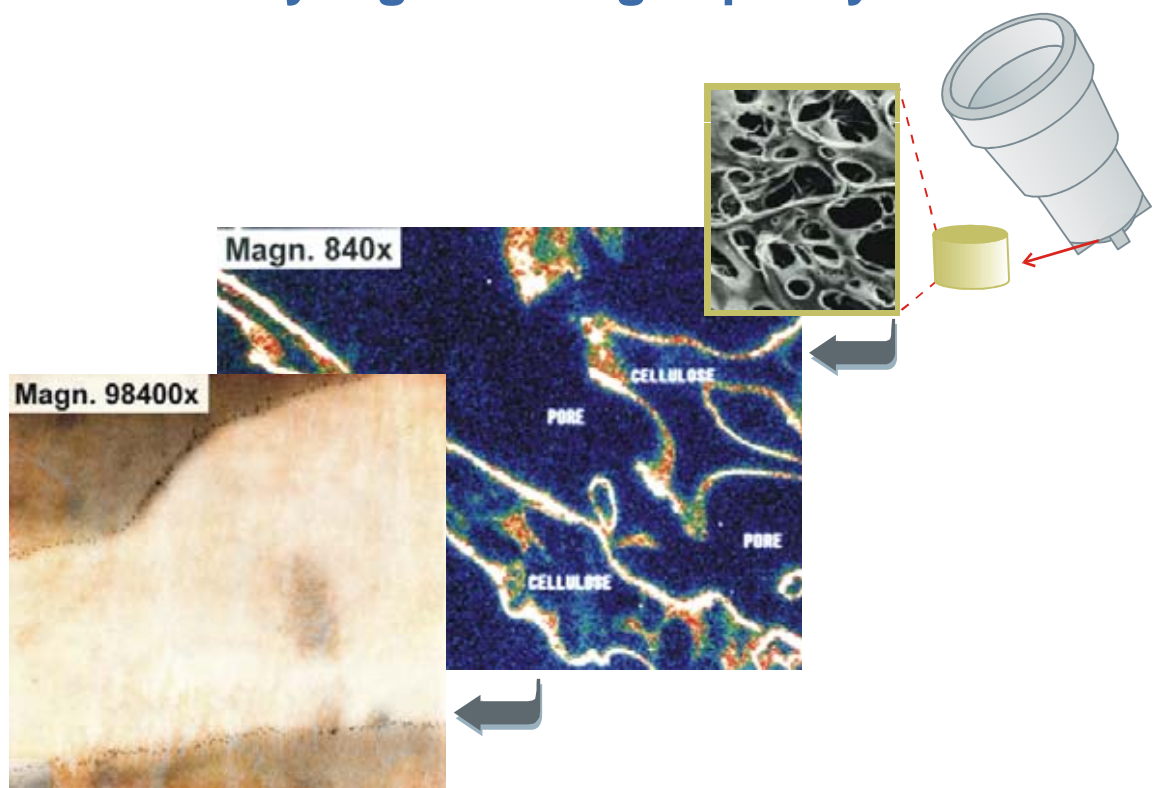


Prerequisites for a quantitative specific IgE test

- Excess of allergen
- Precision
 - Reproducibility
 - Repeatability
- Linearity
- Calibration traceable to WHO



Solid phase: ImmunoCAP™ – extremely high binding capacity



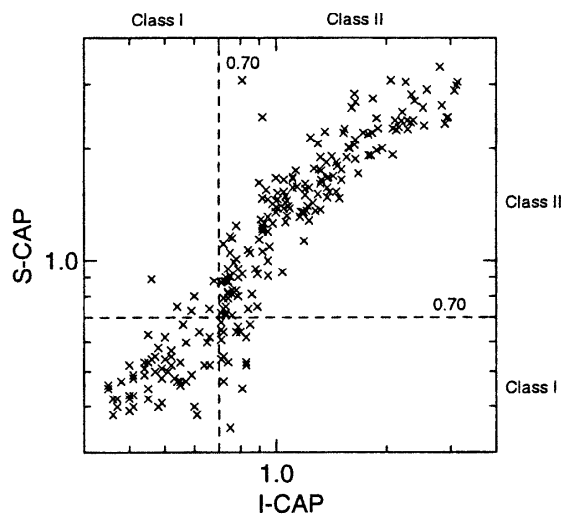
L. Sevéus & A. Sandell, 1992

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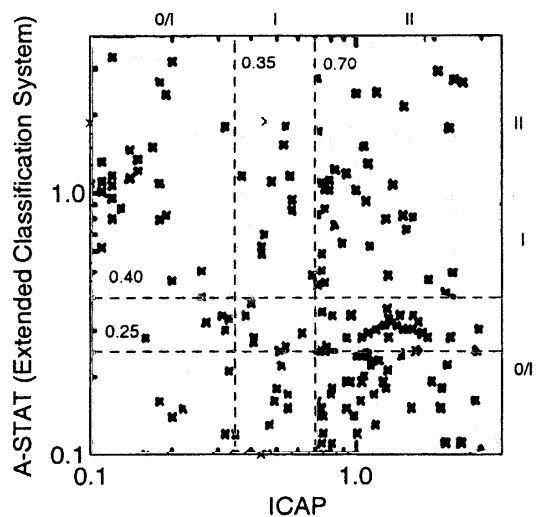


Comparison of results from different laboratories running Pharmacia CAP System and DPC microplate

I-CAP vs S-CAP



I-CAP vs A-STAT



I-CAP: Pharmacia CAP System (Laboratory I)
S-CAP: Pharmacia CAP System (Laboratory II)
A-STAT: AlaSTAT, DPC (Laboratory III)

Scatter plots of values from methods related to their own cut-off values between class 0 / 1 and class 1 / 2.

The meaning of a class result is totally different for different specific IgE measuring methods. Class X for A-STAT is not the same as class X for S-CAP. Kendall's W test showed significant different results from different assays. Kendall's W across all assays was 0.120; $\chi^2 = 49.41$; $p < 0.01$

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Allergy care

Diagnosis

An early identification of offending allergens



Limitation of allergen exposure with appropriate treatment



Prognosis

Decrease of the severity of reactions and a delay of the disease progression



Better outcome