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ALLERGY AND CLINICAL IMMUNOLOGY

1

HIGH AFFINITY IgE RECEPTOR MEDIATED PROTEIN TYROSINE PHOSPHORYLATION: EVIDENCE FOR A NOVEL SIGNAL TRANSDUCTION PATHWAY-V. Stephan[1], M. Benhamou[2], S. Gutkind[2], V. Wahn[1] and R.P. Siraganian[2] [1]Universitätskinderklinik Düsseldorf, Moorenstr. 5, 4000 Düsseldorf [2]National Institutes of Health, Bethesda, MD, USA

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The rat basophilic leukemia cell line (RBL) is an excellent model for the investigation of IgE-mediated signal transduction. Recently, we demonstrated that aggregation of the high affinity IgE receptor (FcεRI) results in rapid tyrosine phosphorylation of a 72 kDa molecule (pp72). Here we investigated the relationship of pp72 phosphorylation to previously known signal transduction signals, in particular G protein activation and phosphatidylinositol (PI) hydrolysis by phospholipase C (PLC). Activation of G proteins by sodium fluoride or the non-hydrolysable GTP analog GTPγS induced both PI hydrolysis and histamine secretion without tyrosine phosphorylation of pp72. Similarly, in RBL cells transfected with the G protein coupled muscarinic acetylcholine receptor, stimulation with the agonist carbachol activated phospholipase C and histamine secretion without pp72 phosphorylation. Therefore, pp72 phosphorylation was not induced by G protein activation, or as a consequence of PI hydrolysis. To investigate whether pp72 phosphorylation precedes the activation of phospholipase C, we studied the effect of the tyrosine kinase inhibitor genistein. Preincubation of the cells with genistein decreased in parallel antigen-induced tyrosine phosphorylation of pp72 (IC_{50} = 31μg/ml) and secretion of histamine (IC_{50} = 34μg/ml). In contrast, genistein in concentrations of up to 60 μg/ml did not inhibit PI hydrolysis nor did it change the amount of the calcium releasing secondary messenger inositol (1,4,5) trisphosphate. These results suggest that pp72 phosphorylation represents a novel, independent signal transduction pathway induced specifically by activation of FcεRI.

2

PREVALENCE OF ASTHMA AND ALLERGIC DISEASE IN THE UNITED GERMANY. E.v.Mutius, Ch.Fritzsch, S. Weiland, E.Stiepel, H.Magnussen. University Children's Hospital Munich/Leipzig; Institute for Biostatistics Bochum/Munich, Krankenhaus Großhansdorf, Germany.

Aim and Methods: Environmental exposure in eastern (Leipzig (L)) and western (Munich (M)) Germany of SO2 and particulate matters differs by factor of 30 and 10 respectively. We studied cross-sectionally n=7445 children in M and n=1429 in L (age 9-11 years) for prevalence of asthma and allergies with a parental self administered questionnaire (Q) and a cold air challenge to test for bronchial hyperreactivity (BHR). Results. Response rates were 87% in M and 75% in L. 89% in M and 92% in L of responding subjects were screened for BHR (postchallenge drop of FEV1 >9%). According to Q the parents gave doctor diagnoses and self reported symptoms: (*p<0.05)

Doctor diagnosis	Munich(n=5030)		Leipzig(n=1051)
Asthma	8.7% (7.9-9.5)	*	6.8% (5.4-8.4)
Bronchitis	20.7% (19.5-21.9)	*	36.0% (32.9-38.9)
Hay fever	10.7% (9.9-11.6)	*	3.4% (2.4-4.6)
Atopic dermatitis	13.9% (12.9-14.9)		12.9% (10.9-15.1)
Parent reported symptoms			
Wheeze	15.9% (14.9-16.9)		18.6% (16.3-21.0)
Cough	7.4% (6.7-8.1)	*	10.8% (8.9-12.9)
Running nose	17.4% (16.4-18.5)	*	12.1% (10.2-14.2)
Itchy skin rash	17.5% (16.4-18.6)		17.8% (15.5-20.2)

BHR was obtained in 6.4% of children in M and 5.5% of children in L. Conclusion. We suggest that in L a thirty-fold elevated level of London-type smog increases the prevalence of bronchitic symptoms significantly without affecting BHR and allergic manifestation.

3

QUANTITATIVE MEASUREMENTS OF SKIN PRICK TESTS (SPT) AND SPECIFIC IGE - RELATION BETWEEN VALUES AND DIFFERENT RESPIRATORY ALLERGIC DISEASES. Mário M. Almeida, Cristina S. Marta, Paula L. Pinto, Abreu Nogueira, Rosado Pinto. Immunoallergy; D. Estefânia Hospital, Lisbon, Portugal.

Diagnosis of allergy is supported by "in vivo" (ex: SPT) and "in vitro" methods (ex: specific IgE). SPT is influenciated by a lot of variables, so standardization is essential to obtain precise and reproducible quantitative results. This can be a achieved by a method of reading using a computorized digitalized graphics tablet with CAD software, created and validated by the authors and published elsewhere. The Pharmacia CAP System allows precise quantification of specific IgE and is more sensitive than RAST. Preliminar data obtained by the authors, showed that for D. Pteronyssinus (D.Pt) the SPT results done with extracts from Bencard (B) and Merck (M) had good correlation with specific IgE determined by CAP System (as quantitative values and as +/-).

The aim of the study was to establish the possible relations between quantitative results of SPT and CAP and different respiratory allergic diseases with the same severity in a pediatric population sensitized to D.Pt. We include 73 children (47 ♂; 26 ♀,) aged 4 to 15 y. (mean age ± SD: 9.70 ± 3.24), 13 with Rhinitis (R), 16 with Asthma (A) and 44 with A+R. The SPT was done with a standardized lancet (DHS) using cut off +/- 7mm2, with the method cited above and with extracts for D. Pt from B and M. The determination of specific IgE was done by Pharmacia CAP System.

Results: 1) Mean age ± SD in R group : 11.31 ± 2.72; A group: 9.48 ± 3.50, without statistically significant differencies. 2) SPT results (mean areas ± SD): R group (B:43.20 ± 20.69 mm2; M: 36.72 ± 22.18mm2); A group (B:50.48 ± 25.11mm2; M: 50.70 ± 35.24mm2); A+R group (B: 61.93 ± 28.20mm2; M: 47.98 ± 39.34mm2). 3) CAP results (mean values ± SD): R group (13.92 ± 14.44KU/L; A group (27.01 ± 30.26KU/L); A+R group (39.12 ± 29.35KU/L).

Conclusions: 1) The results of quantitative SPT for both extracts related to R, A and A+R don't show statistically significant differencies. 2) The quantitative values of specific IgE show that there are differencies between all the entities, with lower results to R and higher to A+R. 3) Based on previous data suggesting that within the same disease, the severity is directed related with higher titers of specific IgE, our data may support that the "severity" of A+R > A > R.

4

CHANGE OF CLEANING PROCEDURES DOES NOT DECREASE THE CONCENTRATION AND TOTAL AMOUNT OF *Fel d1* IN HOMES OF ALLERGIC CHILDREN. AKM Munir, Roland Einarsson, Sten KG Dreborg. Department of Pediatrics, University of Linköping, Linköping, Sweden.

We have found the levels of cat and dog allergen in school dust to be high enough to cause symptoms in sensitized children.

To investigate whether there are differences in cleaning capacity between common vacuum cleaners and chemical treatment of surfaces, we recruited 50 families with allergic children. No family kept pets at home. Ten families had central vacuum cleaning equipment and continued to use it. The others were allocated by random to four groups with 10 families in each group. They used their own vacuum cleaners in combination with tannic acid (T) in a spray, their own vacuum cleaner with placebo (P). a new vacuum cleaner with micro-filter or a new vacuum cleaner with HEPA-filter, i.e. with 99.999 % cleaning effect. Samples were collected from carpets and furniture in the main room and from the child´s mattress. A filter with a special device (ALK) attached to a vacuum cleaner was used.

After the first sample was collected on Sunday, week 0. groups T and P applied the liquid to the carpets and upholstered furniture in the main room. The houses were then cleaned for five weeks. Samples were collected after 1, 3 and 5 weeks. *Fel d1* was determined by a sandwich ELISA method.

Results: Tannic acid reduced the concentration and amount of cat allergen by 50 % after one week. No other changes were noted. The level of *Fel d1* varied from below the detection limit (16 ng/ml) to 30 μg/g of fine dust.

Conclusions: Introduction of new and better cleaning procedures does not reduce the allergen load in homes of allergic children . This is probably due to the large reservoirs of dust are still present after normal cleaning. The dust is then redistributed all over the house. AIt might also be that allergen is brought to the house by visitors.