675 Weather Changes Are Perceived as a Common Trigger in Asthma Patients

E. E. Clarke, D. A. Khan; University of Texas Southwestern Medical Center, Dallas, TX.

RATIONALE: Patients frequently report weather changes as a trigger for asthma symptoms. We sought to formally assess the importance of weather changes on patients' perception of asthma symptoms.

METHODS: A survey was developed which assessed how often the following triggers worsened patients' asthma symptoms: having a cold, cigarette smoke, changes in the weather, animal hair, exercising, pollen, emotional stress, air pollution, strong smells, heartburn, and allergies/nasal symptoms. The survey used a five-point scale ranging from never to always. The survey was administered to patients with a diagnosis of asthma who were being seen by an allergist, (either at a publicly funded county hospital clinic or at a private university clinic).

RESULTS: Sixty-one patients completed the survey, of which 43 were from the county hospital clinic and 18 were from the university clinic. 82% were female and 18% were male. 48% were black, 30% white, 12% Hispanic, and 10% other. Weather changes (p=0.039) and allergies/nasal symptoms (p=0.012) were found to be the most often cited triggers for asthma. In contrast, heartburn (p=0.001), emotional stress (p=0.012), and animal hair (p=0.047) were not identified as triggers for asthma symptoms. Identification of having a cold, cigarette smoke, exercising, pollen, air pollution, and strong smells as triggers were not statistically significant amongst asthma patients.

CONCLUSIONS: Weather changes are perceived as one of the most common triggers for worsening of symptoms among asthma patients. Further studies are needed to assess the validity of this perception.

676 Asthma, a Risk Factor For Heart Disease?

D. R. Sun[1], C. Xu[2]; [1]Virginia Commonwealth University, Richmond, VA, [2]VHQC, Richmond, VA.

RATIONALE: The Th2 response involving lymphocytes, IgE, mast cells and eosinophils underlies inflammation in asthma, whereas the innate system involving monocytes and macrophages drives atherosclerosis and ischemic remodeling in cardiovascular disease. We looked for associations between heart disease and its covariates.

METHODS: Secondary analysis was performed using SAS version 9.2 on data from the cross-sectional survey 2007 Missouri county level study of adult tobacco use and related chronic conditions and practices. 51,144 non-institutionalized individuals ages 18-99 were selected using random digit dial telephone survey. Questions of interest included: "1.6 Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed or a special telephone?" If subject answered yes, then the next question was: "1.7 what is your major impairment or health problem?"

RESULTS: 322 individuals answered "Yes" to question 1.6 and "Heart problem" to question 1.7. A multivariate binary logistic regression model controlled for age, gender, employment status, income level, hypertension, hypercholesterolemia, diabetes, physical exercise, smoking status, fruit/vegetable intake and body mass index as confounders. Asthma was found to be significantly associated with heart disease with an odds ratio of 1.8 (95% CI 1.3, 2.5). Predicted probabilities by the multivariate binary logistic regression model and the observed responses were 90.3% concordant.

CONCLUSIONS: Patients with asthma experience 81% higher likelihood of heart disease than patients without asthma. The cross-sectional design of the above-mentioned survey prevents the establishment of temporality. Cohort studies are needed to further elucidate the possible association.

677 Characteristics of a Novel Allergen of Samba Wood

A. Aranda[1], P. Campo[2], A. Palacin[3], A. Diaz-Perales[3], J. Rodriguez-Bada[1], G. Salcedo[3], M. Blanca[2]; [1]Fundacion Imabis-Carlos Haya Hospital, Malaga, SPAIN, [2]Carlos Haya Hospital, Malaga, SPAIN, [3]Unidad de Bioquimica, Departamento de Biotecnología, E.T.S. Ingenieros Agronomos, Madrid, SPAIN.

RATIONALE: Characteristics of wood allergens that may cause respiratory allergic disease are not well known except for plicatic acid (red cedar) and a 36 kD allergen of samba wood (class I chitinase). The aim of this study was to further characterize and identify samba wood allergens and evaluate immunological responses in exposed subjects.

METHODS: Identification of IgE binding bands using in-house extract and pooled sera from samba-sensitised patients was done by SDS-PAGE and immunodetection assays. Identified bands were purified by anion-exchange chromatography and RP-HPLC. Protein analysis was performed by mass spectrometry and N-terminal sequence. Allergenic potency of proteins was tested by ELISA in exposed subjects (n=24). Immunodetection assays and basophil activation test were performed in selected exposed subjects with the highest levels of specific IgE to total extract (n=20) and an unexposed control group (n=10).

RESULTS: Samba extract showed three reactive bands of 24, 12 and 14 kDa. A 24 kDa protein was identified as a putative thaumatin-like protein demonstrated by anti-TLP antibodies. The 12 and 14 kDa proteins seemed to be specific cleavage from the 24 kDa (presence of same N-terminal sequences). The 24 kDa band was recognized by ELISA in 79.2% of exposed subjects. Basophil activation test was positive in 50% exposed subjects whereas no positive results were found in controls.

CONCLUSIONS: Presence of three IgE reactive components in samba dust has been demonstrated, being one of them a thaumatin-like protein. The presence of these new allergens may cause a possible cross reactivity with food and pollens.

678 Environmental Chemical Exposure May Augment Occupational Asthma

S. E. Anderson, J. Franko, D. Beezhold, B. J. Meade; CDC/NIOSH, Morgantown, WV.

RATIONALE: During the past several decades there has been a remarkable and unexplained increase in the prevalence of asthma. Work related asthma has become the most frequently diagnosed occupational respiratory illness accounting for 10-25% of adult asthma. While the hygiene hypothesis provides one potential explanation, individuals in industrial societies are also inadvertently exposed to an increasing number of chemicals. While many chemicals are known to directly induce asthma there is also the potential for non-sensitizing chemicals to augment the immune response induced by other chemical and protein allergens.

METHODS: Use a murine model to evaluate the immunomodulatory effect of co-exposure to non-sensitizing chemicals with occupationally relevant protein and low molecule weight (LMW) chemical allergens.

RESULTS: Dermal application of environmentally relevant chemicals, perflourooctanonic acid (at concentrations up to 1.5%), or di-ethyl phthalate (at concentrations up to 100%) simultaneously with exposure to a protein (ovalbumin) or LMW respiratory (toluene diisocyanate) allergen was found to augment the allergic response to that allergen. Observed changes in mice include elevated total and antigen-specific IgE and IgG$_1$, increased IL-4 and IL-5 production by lung associated lymph nodes, increased airway hyperreactivity, and increased lung eosinophils compared to mice exposed to each allergen alone.

CONCLUSIONS: Dermal exposure to environmentally relevant chemicals concurrently with well characterized protein and LMW chemical allergens was demonstrated to augment asthma in an animal model. Understanding the mechanisms by which mixed exposures influence and augment asthma and asthma-like symptoms may lead to better prevention strategies for those at risk for occupational asthma.

MONDAY