55. Asthma: risk factors and effect of anti-IgE

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Assessment of long-term omalizumab treatment in severe allergic asthma

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Objectives: Several clinical studies have demonstrated omalizumab efficacy in patients with severe allergic asthma, but the treatment period has always been relatively short (4-12 months). There are a few data long term omalizumab therapy. We aimed to assess the long-term clinical and functional effectiveness of the omalizumab treatment in severe allergic asthmatic patients.
Methods: Medical registries were used to evaluate the 0, 4, 12 and 36 months effectiveness of omalizumab treatment. 26 patients (female/male:21/5) with severe allergic asthma, uncontrolled despite GINA Step 4 therapy. Effectiveness outcomes included spirometry, level of asthma control which evaluated by asthma control test (ACT), systemic glucocorticosteroid (sGCS) use, emergency room (ER) visits and hospitalizations for severe exacerbations.
Results: The mean age was 47.6±13.9 and duration of allergic asthma 22.7±10.1 years. Total IgE serum levels was 322.0±178.1 IU/mL. Mean duration of omalizumab treatment was 40.8±8.2 months. FEV1 improved statistically significant at all time points versus baseline ($p<0.05$). The level of asthma control as evaluated by ACT was significantly improved after treatment ($p<0.05$). We determined significant reduce numbers of exacerbation ($p<0.05$), emergency visits ($p<0.05$), hospitalizations ($p<0.05$), sGCS ($p<0.05$) and SABA ($p<0.05$) use at 36 months.
Conclusion: This study showed that long-term therapy with omalizumab for up to 3 years was well tolerated with significant improvement of both symptoms and function. For this reason, suggesting that administration of omalizumab for longer than 12 months could be beneficial for responders patients.

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Omalizumab improves lung function in severe persistent allergic (IgE-mediated) asthma patients: Pooled data from 5 UK centres

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Omalizumab is an effective add-on therapy for patients with severe persistent allergic (IgE-mediated) asthma. However, in the UK there are limited data reporting on the real-life effectiveness of omalizumab therapy on patient outcomes, particularly with regard to effect on lung function. We retrospectively reviewed outcomes in severe allergic asthma patients receiving omalizumab at 5 South West UK centres (Exeter; Plymouth; Bath; Taunton; Torbay). Data were compared for 12 months pre-omalizumab vs 16 weeks and most recent assessment (last 12 months) post-omalizumab initiation. Patients (n=51; age 17–69 years) received omalizumab for an average of 798 days (range: 190–1569). 41/51 (80%) patients responded to treatment at 16 weeks and are included in this analysis. Post omalizumab initiation, mean FEV_1 (L/min) improved from 1.9 pre-omalizumab to 2.3 (16 weeks) and 2.1 (most recent). Mean maintenance oral corticosteroid (OCS) dose pre- and post-omalizumab was 22.7 and 8.9.mg/day, respectively. Overall mean [SD] scores for AQLQ and ACT improved after 16-weeks' treatment: +1.6 [0.86] and +3.0 [9.5], respectively. Reductions were seen post-omalizumab in hospital admissions/bed days, accident & emergency (A&E) and GP visits (most recent [Table]). These results demonstrate omalizumab's effectiveness in improving lung function and other clinical/patient-reported outcomes in severe persistent allergic asthma patients in a 'real-life' clinical setting.

	Hospital admissions	Hospital bed days	ICU admissions	A&E visits	GP visits
Pre-omalizumab (n=41)	81*	152†	2**	99‡	50§
Post-omalizumab (n=41)	44*	50†	0**	20‡	0§

*n=33; †n=13; **n=22; ‡n=30; §n=4; ICU = intensive care unit.

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Long-term effectiveness of omalizumab in patients with severe persistent allergic (IgE-mediated) asthma: Real-life data from 3 UK centres

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For patients with uncontrolled severe persistent allergic (IgE-mediated) asthma, omalizumab is an effective add-on therapy. However, limited data are available reporting on long-term effectiveness of omalizumab in UK clinical settings. In a previous pooled analysis using data from 3 UK centres, healthcare utilisation substantially reduced and patient reported outcomes improved post-omalizumab in patients with severe allergic asthma (mean treatment duration: 982 days; range: 112–3839). Using the same patient cohort, data were compared for 2 years pre-omalizumab and for most recent assessment post-omalizumab initiation, to determine if improvements were sustained with longer-term treatment. Patients (n=50; age 18–74) received omalizumab for mean of 1318 days (range: 238–4217). 85% patients were responders at 16 weeks. Reductions in hospital admissions/bed days, accident & emergency (A&E) and GP visits were seen post-omalizumab (Table).

	Hospital admissions	Hospital bed days	ICU admissions	A&E visits	GP visits
Pre-omalizumab (n=50)	162*	259†	12**	159‡	454§
Post-omalizumab (n=50)	20*	6†	1**	32‡	131§

*n=42; †n=27; **n=23; ‡n=49; §n=39; ICU = intensive care unit.

Mean maintenance oral corticosteroid (OCS) dose reduced pre- to post-omalizumab: 12.8 to 4.5 mg/day. Overall mean [SD] AQLQ score (+1.6 [1.5]) and ACT score (+3.9 [10.3]) improved post omalizumab; in patients not on OCS vs patients on OCS (at baseline) improvements were greater: AQLQ: 2.2 [1.1] vs 1.5 [1.5]; ACT: 8.8 [4.9] vs 7.0 [6.5]. Results from this real-life follow-up study demonstrate that improved outcomes in patients with severe allergic asthma are sustained with longer-term omalizumab therapy.

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Real-life effectiveness of omalizumab in patients with severe persistent allergic (IgE-mediated) asthma: Pooled data from 4 UK centres

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Omalizumab is an effective adjunctive therapy for patients (age ≥6 years; European Union), with uncontrolled severe persistent allergic asthma. To evaluate the effectiveness of omalizumab on real-life outcomes in UK clinical settings, we retrospectively reviewed records from severe allergic asthma patients who were receiving omalizumab (150–600 mg q4wk or q2wk) at 4 UK centres. Data were compared for 12 months (Plymouth) or 2 years (Chertsey; Bradford; Colchester) pre-omalizumab and for the most recent assessment following omalizumab initiation.
Patients (n=80; age 14–74 years) received omalizumab for an average of 1190 days (range: 112–4217). 82% patients responded to treatment at 16 weeks. There was a decrease in hospital admissions/bed days, ICU admissions, and accident & emergency (A&E) and GP visits (Table) and in oral corticosteroid (OCS) use post omalizumab initiation; mean maintenance dose of OCS pre- and post-omalizumab was 14.6 and 4.7 mg/day, respectively. Mean [SD] improvements were also observed in Asthma Quality of Life Questionnaire (AQLQ) score (+1.6[1.4]) and

	Hospital admissions	Hospital bed days	ICU admissions	A&E visits	GP visits
Pre-omalizumab (n=80)	213*	451†	16**	236‡	592§
Post-omalizumab (n=80)	27*	19†	1**	37‡	139§

*n=66; †n=47; **n=45; ‡n=74; §n=53; ICU = intensive care unit.

Asthma Control Test (+3.8[9.0]). Patients not receiving OCS at baseline (n=22) achieved higher mean [SD] AQLQ scores compared with those receiving OCS at baseline (n=49): 1.8[1.5] vs 1.6[1.3], respectively. These results demonstrate the effectiveness of omalizumab in a clinical setting, and further support the efficacy of omalizumab shown in clinical trials.

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Efficacy and safety of omalizumab in real-life practice in India

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A 52-week, post-marketing study to assess the efficacy and safety of omalizumab in an Indian population is ongoing; we present interim 16-week data.
This is an open-label, multi-center, observational, post-marketing study in 72 patients (mean age 51.7±14.9 y) with moderate-to-severe persistent allergic asthma. Endpoints are asthma exacerbations, work/college days missed, hospitalizations, ACQ 5 and ACT scores, FEV_1, and ICS use. Safety and tolerability are also being assessed. Qualitative and quantitative variables are analyzed using Chi-Square tests and paired t-tests, respectively. All parameters are compared from baseline to week 16 of omalizumab treatment.
35.9% of patients experienced ≥1 exacerbation at baseline. This reduced significantly to 15.4% at week 16 (p=0.046). The proportion of patients missing college/work and requiring unscheduled hospitalizations also reduced significantly with omalizumab (41.7% to 12.5%, p=0.039; 23.7% to 2.6%, p=0.021, respectively). ACQ scores significantly improved with omalizumab; composite scores decreased by 4.2 (14.8 vs. 10.6, 95%CI -6.5 to -1.9; p=0.001) and mean scores by 0.8 (3.3 vs. 2.5, 95%CI -1.4 to -0.2; p=0.015). ACT scores improved significantly by 5.3 (10.1 vs. 15.4, 95%CI 2.4 to 8.4; p=0.002). FEV_1 improved by 0.51L (1.23 vs. 1.74, 95%CI 0.38 to 0.64; p=0.000), and mean ICS dose decreased by 109μg (700.8μg vs. 591.8 μg, 95%CI -205.4 to -12.5; p=0.028). One gastrointestinal adverse event of moderate intensity (suspected drug related) was reported during the study and resolved with concomitant medication.
Omalizumab is an effective and safe therapeutic option in Indian patients with uncontrolled allergic asthma despite high-dose ICS plus LABA.

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Natural history of IgE sensitisation to food allergens in a cohort of adults

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Background: The prevalence of sensitisation to aeroallergens is reported to be unchanged or to decrease in adults in longitudinal studies. No longitudinal studies exist on the natural history of sensitisation to food allergens.
Methods: A subgroup of participants from the European Community Respiratory Health Survey (ECRHS) in Iceland and Sweden (n = 806) performed allergy tests (aeroallergens and food allergens) in ECRHS I (1990-1991), and ECRHS II (1999-2000) within the frame of EuroPrevall. IgE-sensitisation was measured against mite, cat (referred as perennial), timothy (referred as grass pollen) and egg white, milk, fish/cod, wheat, peanut, and soy (referred as food allergens).
Results: Food sensitisation decreased by 56% (from 5% to 2.2%). Peanut IgE-sensitisation was the most common food allergen sensitisation and its prevalence decreased by 67% (from 2.7% to 0.9%). Perennial allergen sensitisation decreased by 9% (from 18.5% to 16.8%) and grass pollen sensitisation decreased by 15% (from 17.5% to 14.8%) (all p-values<0.001). The decreasing prevalence of allergic sensitisation for food, perennial and seasonal allergens was found both in subjects younger or older than 31 years (median age of cohort in ECRHS I). Persistence of sensitisation to food (10 of 40 subjects), perennial (114 of 149 subjects) and grass pollen sensitisation (104 of 141 subjects) was related to higher levels of total IgE at baseline (p<0.01).
Conclusion: Prevalence of allergic sensitisation to food decreased in adults during a 9-year-period and this is likely to be due to aging. Persistence of IgE to food allergens was related to higher baseline levels of total IgE.

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Analysis of IL-6 function in transmaternal asthma protection induced by Acinetobacter Iwoffii

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Introduction: It has been shown in a mouse model that treatment of pregnant mice with the farm- derived bacterium Acinetobacter lwoffii F78 protects the progeny of these mice against experimental induced asthma but until now it is not clear how the protective effect is transmitted from the mother to the fetus.
Aim and subjectives: To find out if the upregulation of IL-6 during the treatment of pregnant mice with Acintobacter lwoffii is involved in transmitting the asthma-protective effect from the mother to the offspring.
Methods: To analyze the role of IL-6 in transmaternal asthma protection female IL-6 ko mice in a Balb/c background (IL-6 –/–) were treated with Acinetobacter lwoffii F78 and mated to wildtype males (IL-6 +/+). The heterozygous offspring (IL-6 +/–) was than sensitized and challenged with OVA to analyse the asthmatic phenotype. To rule out that already the loss of one copy of IL-6 affects the asthmatic phenotype without A. lwoffii treatment the asthmatic phenotype of IL-6 ko and IL-6 heterozygous mice was additionally analysed in an acute asthma model.
Results: In the acute model IL-6 ko mice exhibit an exacerbated asthma phenotype with increased numbers of eosinophils in the BAL and augmented concentration of Th2 cytokines compared to the wildtype. The heterozygous mice show the same phenotype as wt mice. In the prenatal model the offspring of IL-6 ko female treated with A. lwoffii display a strong asthmatic phenotype.
Conclusions: IL-6 might be involved in transmaternal asthma-protection induced by the farm-derived bacterium Acinetobacter lwoffii.

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Allergyprotective effects of Staphylococcus scuiri in a house dust mite (HDM) model of allergic airway inflammation

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Background: Recently, epidemiological studies revealed a specific association between Staphylococcus scuiri exposure and reduced asthma prevalences.
Aim: To investigate the influence and role of S. scuiri, a Gram-positive bacterium, on allergen-induced sensitization and airway inflammation in a murine model with a mixed phenotype (with eosinophil and neutrophil inflammation) using a clinically relevant allergen (HDM model).
Methods: Mice were treated intranasally with S. scuiri three times a week before and during repeated intranasal exposures to HDM extract. Lung function, recruitment of inflammatory cells as well as production of related cytokines and chemokines were measured.
Results: The application of S. scuiri strongly inhibited the generation of HDM extract-induced airway inflammation. Analyses of bronchoalveolar lavages showed a reduction of both, eosinophil and neutrophil numbers, in comparison to control-animals. The reduction of eosinophils correlated with a reduction of IL-5, and of goblet cell hyperplasia. The mRNA expression of eotaxin and KC, the key chemokines in the induction of eosinophils and neutrophils into allergic tissue, was markedly reduced.
Conclusions: Administration of S. scuiri to mice challenged with HDM extracts protects them from the development of airway inflammation and associated pulmonary pathology.

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Balance disturbances in asthmatic patients. An unrecognized link between lung, brain and labyrinth

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Background: Correlations between asthma and anxiety and between anxiety and balance disorders have been repeatedly described. These observations suggest that equilibrium abnormalities may also be present in asthmatic patients. This issue is clinically relevant because untreated postural deficits can potentially worsen the prognosis of asthma by triggering anxiety and, consequently, respiratory symptoms. This study aimed to evaluate the efficiency of postural control in asthma patients and its potential correlation with anxiety symptoms.
Methods: We compared 30 subjects with persistent, controlled asthma to 30 age- and sex-matched controls. Anxiety symptoms were evaluated using the Spielberger State-Trait Anxiety Inventory (STAI). Balance control was evaluated by dynamic posturography using measurements of the center of pressure (CoP) displacement in the latero-lateral and antero-posterior directions.
Results: The asthma group had significantly higher scores for the STAI–State (46.8±11.38 versus 38.2±13.16; t = 2.89; p=0,005) and the STAI-Trait (50.1±13.60 versus 37.9±12.67; t = 4.22; p<0,001). An analysis of covariance (using anxiety as the covariate) showed increased values for the area delimited by the CoP in asthmatic patients.
Conclusion: Balance abnormalities seem to occur frequently in asthma patients independently of the presence of anxiety symptoms. However, the presence of vestibular dysfunction caused by anxiety provocation may have a major impact on the prognosis of these patients. These findings suggest that disequilibrium-related complaints must be investigated in asthmatic patients, particularly in those presenting with higher levels of anxiety.

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Is serum cholesterol a risk factor for asthma?

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Background: Proinflammatory role of serum cholesterol in asthma has been recently explored with contradicting results. Clarity on the link between serum cholesterol and asthma may lead to newer options in planning management strategies. The objective of our study was to examine the relationship between serum cholesterol, asthma and its characteristics.
Method: Forty asthmatics and 40 normal subjects were examined cross-sectionally and their serum fasting cholesterol and serum highly sensitive C reactive protein (hsCRP) levels were measured along with other baseline investigations. All subjects were non smokers.
Results: Serum total cholesterol (mean ± SD) among asthmatics was 176.45±30.77 mgs/dL as compared to 163.33±26.38 mgs/dL among normal subjects ($P < 0.05$). This higher serum cholesterol level was found to be associated with asthma independent of age, gender, BMI, Socioeconomic status and serum hsCRP levels. However the association was only modest {adjusted odds ratio 1.027 (95% CI 1.005 – 1.049) $p < 0.05$}. There was no association between serum cholesterol and asthma characteristics like duration of illness, intake of inhaled steroids and frequency of emergency department visits.
Conclusion: Our study found a weak but statistically significant association between higher levels of serum cholesterol and asthma which is independent of age, gender, BMI, socioeconomic status and serum hsCRP. Future research is required in a larger population to substantiate above association and its clinical implications.

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Climate change: The impact of different pollen burden on hay fever peculiarities

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The aim of the study: To compare hay fever peculiarities and clinical duration in children and adolescents of the same region in the conditions of different pollen burden.
Material and methods: The study conducted in seasons of 2010 and 2011. The special allergological questionnaires were completed. Pollen burden count was assessed by the standard method. Correlation between intensity of clinical manifestations and meteorological factors like average temperature, atmospheric moisture capacity and precipitations were determined. Meteorological data were obtained in the Civil Aviation Meteorological Station of Astana airport.
Results: We compared two different pollen loads in two consequent pollination seasons of 2010 and 2011. Due to unusually warm April of 2011 with average temperature more than 17oC, a great shift in pollination duration and intensity ascertained. The total pollen load in August 2010 was from 14 to 37 pollen grains per one air liter3, whereas in the same period in August 2011 it varied from 31 to 64 pollen grains per one air liter3. Totally 467 patients with hay fever were examined. In comparison to 2010, the season of 2011 showed high incidence of firstly diagnosed hay fever cases (36.4% instead of 17.3%, P<0.001) and increase of morbidity rate from 4.3% to 7.4%, (P<0.01) in young age children. Pollen asthma incidence increased from 26.8% to 42.4%, (P<0,001) and the incidence of dermatological symptoms increased from 24.0% to 29.8%, (P<0.05). The consultation rate increased with the atmospheric moisture capacity higher than 42% and with temperature above 31.0oC.
Conclusions: Climate change has a great influence on hay fever clinical peculiarities in children and adolescents.

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Association between body mass index and asthma, rhinitis and eczema in Chinese school children

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This study aimed to investigate the association between the prevalence of allergic diseases in children and body mass index (BMI). 10338 Chinese children (5095 boys and 5243 girls, aged 6-18 years) were assessed using an ISAAC questionnaire. BMI was calculated and overweight or obesity was defined using the International Obesity Task Force (IOTF) definitions. There was significantly higher prevalence rates of exercise-induced wheezing (4.2% vs 3.1%, p<0.05;3.9% vs 2.9%, p<0.05), asthma ever (1.7% vs 1.1%, p<0.05; 1.5% vs 1.0%, p<0.05), rhinitis ever (17.7% vs 12.8, p<0.001; 15.6% vs 12.4%, p<0.05), hay fever ever (5.2% vs 4.1%, p<0.05; 5.0% vs 1.1%, p<0.05) in overweight children or children with higher BMI percentile (>65th percentile) than other children, respectively. The prevalence of overweight or higher BMI subjects was significantly greater in the atopic group (18.2% vs 14.0%, p<0.001; 37.2% vs 32.6%, p< 0.001), respectively. The obese asthmatic children had a significantly higher prevalence of sleep disturbances due to wheezing than non-obese asthmatics (p<0.01). They also reported more speech disturbances (23.1% vs 9.5%, p = 0.082) and a higher number of wheezing attacks in the past 12 months (more than 12, 15.4% vs 8.4%, p = 0.106) than the non-obese asthmatic children. Most of the obese atopic children were already overweight or obese at the time of the diagnosis (66.6%). None of the associations were significantly different for boys or girls. The study shows that there is some evidence of an association between excess body weight or obesity and atopy particularly asthma and that being overweight might increase the likelihood of asthma and other allergic conditions.

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Prevalence and severity of asthma, rhinitis and eczema in Chinese school children

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The prevalence of asthma has been increasing in the industrialised world over the past few decades. We studied 10824 Chinese school children (5305 boys and 5519 girls) from Shijiazhuang city in Hebei Province in China. We used ISAAC questionnaire (the International Study of Asthma and Allergies in Childhood). This major project is a baseline of a longitudinal study looking at changes in the prevalence rates of asthma, rhinitis and eczema in these children and risk factors of asthma and allergies in Chinese children including high level of air pollution. The prevalence rates were higher in boys compared to girls (wheeze ever 6.6 vs 4.9; exercise-induced wheeze 3.4 vs 3.2; asthma ever 1.5 vs 0.8; ever rhinitis 15.4 vs 12.2; current rhinitis 11.1 vs 8.3; hay fever ever 4.8 vs 3.8; chronic rash ever 2.7 vs 2.2; and eczema ever 12.4 vs 10.7). The prevalence rates were lower than Chinese children living in Hong Kong (wheeze ever 5.7 vs 13.0; asthma ever 1.1 vs 8.6; current wheeze 1.9 vs 6.6; current rhinoconjunctivitis 2.4 vs 16.2; and current flexural eczema 0.9 vs 4.3). These differences may be due to different early life experience and exposure including dietary and aeroallergens exposure. The present study will help to add new knowledge related to the longitudinal effects of air pollution and allergies in Chinese children.

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Time changes in allergic rhinitis in Skopje, the Republic of Macedonia

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Aim: The aim of the study was to assess the 4-yr time changes in allergic rhinitis (AR) due to the lifestyle in young adolescents in Skopje, R. Macedonia.
Methods: Two cross-sectional surveys using ISAAC Phase 3 questionnaires on AR and environmental risk factors were performed. The self-reported data from 3026 adolescents aged 13-14 yrs in the first and from 1088 adolescents in the second survey were analyzed. Pearson chi-square test was conducted in comparisons of prevalence figures between the two surveys.
Results: In 2001-2004 and 2005-2008 survey the established prevalence rates of AR were as follows, respectively: for AR symptoms "ever" 30.0 vs. 27.9%, for current AR symptoms 23.1 vs. 19.9% (p=0.034), for current severe AR symptoms 2.5 vs. 2.3% and for ever-diagnosed hay fever 6.7 vs. 4.4% (p=0.007). Significantly decreased prevalence rates of frequent milk and eggs intake (68.3 vs. 62.7% and 23.6 vs. 20.3%), TV-watching time 3 hours daily (63.3 vs. 38.9%), gas cooking (12.0 vs. 9.1%) and wood/coal/oil heating (18.0 vs. 10.8%) at home, cat and dog ownership (24.1 vs. 13.5% and 27.7 vs. 22.0%) and increased ones of frequent vegetables intake (55.6 vs. 70.9%), seafood (3.4 vs. 6.2%), fast food (17.8 vs. 26.0%) and acetaminophen (6.8 vs. 22.0%) intake as well overweight (15.2 vs. 18.1%) and older siblings (50.6 vs. 54.8%) in the two surveys were established.
Conclusion: The findings suggest a decrease in allergic rhinitis in young adolescents due to changes in their lifestyle during the 4-year study period. An effort to educate them to reduce their fast food and acetaminophen intake as well overweight should be made.

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Impact of adult rhinosinusitis on asthma severity

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Objectives: This study aimed to evaluate the prevalence of rhinosinusitis in patients with asthma, and to examine the interrelationship between both conditions, as well the correlation of rhinosinusitis symptoms to radiological findings.
Methods: A prospective study was carried out during the period 2009 - 2010 enrolled 280 asthmatic patients of different severity scores, all screened for any as-

sociated symptoms of rhinosinusitis, and evaluated radiologically for the evidence of sinuses mucosal changes.
Results: A total of 280 subjects were screened in this study,78% were females with mean age of 40 years.
In this group 92% of these patients have symptoms of allergic rhinitis, and the asthma severity score was intermittent in (3%), mild persistent in (35%), moderate persistent (53%), and severe persistent asthma in (9%) of patients.
A significant correlation was found (P<0.008) between the rhinitis symptoms score and asthma severity score. The prevalence of allergic rhinitis symptoms was correlated with the radiological changes seen at the sinuses CT scan of patients (P<0.004).
Conclusion: This study reinforces the high prevalence of allergic rhinitis in patients with asthma, and its correlation with the severity of asthma for the included patients, as well the rhinosinusitis symptoms was significantly linked to the radiological findings seen at the sinuses CT scan in this group.
Key Words: Rhinosinusitis, Asthma, severity score, CT. scan.

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Association between pet ownership and asthma, rhinitis and eczema in Chinese schoolchildren
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Introduction: The association between pet ownership in childhood and asthma and allergies is very controversial. Our objective was to determine the effects of exposure to cat or dog allergens or both cat and dog allergens on asthma, rhinitis and eczema in a large number of schoolchildren in Shijiazhuang City in Hebei Province in China, which is part of a major longitudinal Chinese study on childhood asthma and allergies.
Body: We studied 10824 schoolchildren, boys and girls, aged 6- 18 years. We used the ISAAC questionnaire and we added questions regarding pet ownership. The prevalence rates of asthma and rhinitis symptoms were higher in children exposed to cats and dogs compared with children not exposed to cats and dogs (wheeze ever 6.1% vs 5.6%; current wheeze 2.4% vs 1.7%; exercise-induced wheezing 4.7% vs 2.9%, P<0.001; cough 12.5% vs 10.9%, P=0.05; ever rhinitis 18.9% vs 12.5%, P<0.001; current rhinitis 13.1% vs 8.8%; rhinoconjunctivitis 3.3% vs 2.1%; hay fever 5.1% vs 4.1%, P=0.06, respectively). However, the prevalence of eczema was higher in children not exposed to cats and dogs compared with those exposed to cats and dogs (11.7% vs 10.5%, P=0.07). Children exposed to dogs had higher prevalence rates of most allergic disorders compared with children exposed to cats. The present study confirms the association between pets ownership and asthma and allergic symptoms in children and the protective effect of pet ownership on eczema.

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Anti-IgE antibodies inhibit the expression of amphiregulin in mast cells and suppress remodeling
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Airway remodeling is a characteristic finding of severe, refractory asthma. Recent studies have demonstrated that anti-IgE antibodies have a high response rate in patients with severe asthma. However, the effects of anti-IgE antibodies on established airway remodeling remain to be established. In the present study, we compared the effects of an anti-IgE antibody with those of steroids in a mouse model of airway remodeling. A model of airway remodeling was prepared by continuously sensitizing BALB/c mice with ovalbumin. After preparing the remodeling model, the mice were divided into 4 groups: a group treated with an anti-IgE antibody (A), a group treated with steroids (B), a group that received both treatments (C), and an untreated control group (D). A group, basement membrane thickening, a marker of remodeling, was significantly inhibited, similar to the effect in the B group. In the C group, synergistic effectiveness was obtained. Smooth muscle thickening was significantly inhibited in the A group, and the effect was stronger than that in the B group. Similarly, in the A group significantly suppressed mast cell proliferation and also inhibited the expression of amphiregulin, a steroid-resistance molecule. Smooth muscle thickening positively correlated with amphiregulin expression, and this correlation was weakened by treatment with A group. In the present study, the inhibitory effect of A group on basement membrane thickening was similar to that of B group. However, smooth muscle thickening was more strongly inhibited by A group than by B group, suggesting that the mechanism of action involved the suppression of amphiregulin expression by mast cells.