97. Asthma: control and treatment

P880

The WHO classification of severe asthma in intensive care patients

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In 2010 a WHO consultative group proposed a definition of severe asthma (JACI 2010; 126:926-3). We have applied this classification to a series of adult patients managed in the intensive care units of 3 large urban hospitals.
Over a 5yr. period (2006-2010), we registered 386 intensive care admissions for asthma in 332 patients. Their mean age was 53 (18)yrs, 57% were women, 48% Chinese, 27% Malays and 14% Indian. Mechanical ventilation was needed in 82% and there were 26 deaths. According to the WHO classification method, the severe asthma, in the first 127 patients, was: untreated in 81 (64%), difficult-to-treat in 41 (32%) and treatment-resistant in 5 (4%). These 3 groups of patients corresponded to distinct and recognizable clinical phenotypes with implications for asthma intervention plans. The untreated patients were from primary care and not attending regular reviews nor receiving long-term control medications. The difficult-to-treat patients were characterized by co-morbidities, non-adherence and under-treatment. We need more effective interventions to reduce the burden of severe asthma at the primary care level. Sub-optimal treatment appeared to be the main barrier to asthma control. Genuine treatment-resistant asthma was an uncommon problem.

P881

Correlation between asthma severity and indices of daily monitoring of peripheral arterial pressure

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Aim of the investigation: to assess correlation between asthma severity and indices of daily monitoring of peripheral arterial pressure (PAP).
Materials and methods: 60 severe BA patients (FEV1 (56,4±2,0)% pred.), male

27, female 33, on the age 24-83 years were studied with the use of ACT, daily monitoring of PAP.
Results: Mean ACT was (16,3±0,9) points, 24 hours' max systolic AP (164,3±3,1) max systolic AP per diem (161,6±3,0), max systolic AP overnight (148,8±3,5), 24 hours' max sphygmic AP (79,0±2,1), max sphygmic AT per diem (78,5±2,1), max overnight sphygmic AP (70,9±2,2), max average overnight AP (105,7±2,3) mm Hg. Correlative analysis revealed presence of significant ($p < 0,05$) moderate link between ACT and indices of PAP (r: -0,501 for 24 hours' max sphygmic AP, -0,469 for max sphygmic AT per diem, -0,447 for max systolic AP overnight, -0,407 for max average overnight AP).
Conclusion: In severe asthma patients as more were PAP, the worse was asthma control.

P882
Comparison of efficacy of grippe vaccination in asthma and COPD patients
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Objective: To compare the efficacy of the seasonal grippe vaccination in asthma and COPD patients.
Material and methods: We evaluate the number of exacerbations and number of hospitalisations in 48 subjects with stage 2 and 3 (moderate/severe) COPD and 45 subjects with mild persistent and moderate persistent Asthma in 6 months period All of them received grippe vaccination before winter. An equal number of COPD and asthma subjects were evaluated like controls. They were not immunized against seasonal influenza. The both groups were matched by sex and age, and receive steroid inhalers (asthmatics), and salbutamol (COPDs) regularly.
Results: In the first group (immunized subjects) we found 12 (25%) exacerbations and 2 (4,2%) hospitalizations (asthma subjects) and 19 (44,2%) exacerbations and 3 (7,0%) hospitalisations (COPD subjects). Very similar number of exacerbations or hospitalizations we found in non immunized group. But in comparison with previous year (first group) when asthma (48) and COPD (45) subjects didn't received grippe vaccination the number of hospitalisations were significantly higher ($P < 0.05$) or 11 (30%) in asthma patients and 23,2% in COPD subjects.
Conclusion: Our results suggest that grippe vaccination may play role in number of hospitalisations in both. (Asthma and COPD subjects)

P883
Association of vitamin D receptor (Fok-I) polymorphism with asthma in Tunisian children
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Vitamin D receptor (VDR) polymorphisms have been implicated in several immune and inflammatory disorders characterized by an imbalance in Th1/Th2 cell activity. Because asthma is characterized by a shift of Th cell responses toward type2, VDR presents itself to be a candidate gene for asthma susceptibility.
In the present study, we investigated the associations of the VDR-Fok-I (F/f) polymorphism with risk of childhood asthma, severity, passive smoke and atopy in Tunisia using case-control study.
Our population consisted in 212 asthmatic children and 152 healthy paediatric controls. Genotyping of VDR-Fok-I (F/f) polymorphism was performed using PCR -Restriction Length Polymorphism (RFLP) analysis.
The case-control study revealed a protective effect of VDR-Fok-I "f" allele in childhood asthma: The VDR-Fok-I (f/f) genotype were less frequent in children with asthma than in healthy individuals (P=0.01; χ^2=8.12). And therefore the VDR-Fok-I (f) allele was less frequent in the case than in the control subjects (p=0.006; OR=0.64; 95% CI= 0.46-0.89; χ^2=7.42). No association was demonstrated with VDR-Fok-I (F/f) polymorphism with severity, atopy or passive smoke.
These data suggest a strong association of VDR-Fok-I polymorphism with asthma in Tunisia. Therefore, the VDR and vitamin D may be involved in the pathogenesis of childhood asthma disease in our population.

P884
The influence of heated heliox-driven nebulizer therapy on pulmonary hypertension and arterial oxygenation of patients with bronchial asthma
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The aim of this study was to evaluate the influence of heated heliox-driven nebulizer therapy on pulmonary hypertension and arterial oxygenation in patients with BA. 40 patients with severe and 40 patients with moderate exacerbation of nonatopic BA were recruited for the study. They received Berodual and Pulmicort delivered by a nebulizer powered by either heated heliox (He/O2 = 80/20; T = 45°C; 20 patients with severe exacerbation (Gr.1), 20 patients with moderate exacerbation (Gr.2)) or air (20 patients with severe exacerbation (Gr.3), 20 patients with moderate exacerbation (Gr.4)) in 10 procedures. We studied systolic pulmonary artery pressure (sPAP) and arterial oxygenation (PaO2). After 10-days treatment patients in Gr.1 had more increasing of PaO2 (58,5±8,2 mmHg vs 70,9±10,0 mmHg, $p<0,05$, increased by 21%), and more reduction of sPAP (41,0±8,5 mm Hg vs 37,5±5,9 mm Hg, $p<0,05$, decreased by 9%), compared to Gr.3: PaO2 (57,9±11,1 mmHg vs 63,0±7,0 mmHg, $p>0,05$, increased by 9%), sPAP (40,6±7,3 mm Hg vs 38,3±6,4 mm Hg, $p>0,05$, decreased by 6%). After 10-days treatment patients in Gr.2 had a significant improvement of PaO2 (64,8±6,4 mmHg vs 73,7±4,2 mmHg, $p<0,05$, increased by 14%), and a meaningful reduction of sPAP (31,±4,2 mm Hg vs 27,7±3,4 mm Hg, $p<0,05$, decreased by 13%), compared to Gr.4: PaO2 (65,0±8,2 mmHg vs 72,0±7,0 mmHg, $p>0,05$, increased by 11%), sPAP (34,0±9,5 mm Hg vs 31,4±8,4 mm Hg, $p>0,05$, decreased by 7%). Thus, complex therapy with heated HDN in patients with severe and moderate BA increases the efficiency of treatment and leads to meaningful reduction of hypoxemia and pulmonary hypertension.

P885
Scheduled asthma management in general practice – Generally increases asthma control in those who attend
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Background: Successful asthma management involves guideline-based treatment and regular follow-up. We aimed to study the level of disease control and change over time in asthmatic individuals managed by their general practitioner (GP) and a dedicated asthma nurse when using a systematic asthma consultation guide based on Global Initiative of Asthma guidelines (GINA guidelines).
Methods: Patients aged 18 years or older with doctor-diagnosed asthma were included. All visits included evaluation of respiratory symptoms, exacerbations, treatment, compliance, lung function, and follow-up appointments. In total, 130 primary care clinics across Denmark participated.
Results: At the initial visit (baseline), 722 patients (37.3%) were classified as well-controlled, 759 (39.2%) as partly controlled and 456 (23.5%) as uncontrolled. At the time of data analysis (Jan 2011), 641 patients had been offered a both a baseline and a follow-up visit. A higher level of asthma control was found at the follow-up visit compared to the baseline visit (uncontrolled asthma 29.7% and 16.5%, respectively, $p<0.001$). At the time of the follow-up visit, 50% of those partly controlled and 52% of those with uncontrolled asthma had changed from SABA only to ICS ($p<0.001$).The level of lung function also improved from the baseline to the follow-up visit.
Conclusion: Although most asthmatic individuals received asthma treatment, a substantial number still were partly or poorly controlled. The overall asthma control improved significantly when a systematic asthma management approach was introduced by educated health care staff.

P886
Is mild asthma outside the guidelines?
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The majority of mild asthma cases, its low level of adherence and asthma control had induced investigators examine this cohort.
The aim was to study specificity of adherence and asthma control level of patients with mild persistent asthma determined by treatment regimen.
131 patients with mild persistent asthma were examined (age 43.2±15.6 yrs). Two groups were formed:1-st group – had regular inhaled corticosteroids (ICSs) treatment for 3 months (n=57), 2nd – had actual intermittent ICSs therapy (n=74). E-questionnaire collects information concerning educational level, social status, knowledge about asthma, FEV1, inflammation parameters (such as Ig E), asthma control, compliance level, etc. 62 patients took part in educational asthma program. We observed uncontrolled asthma in 61.8% of cases. Marker of allergic inflammation - Ig E - had been ranging between 58.8 to 329.4 ME/ml. There were significant correlations between ACT™ score and patients' knowledge about asthma (r=0.52, $p<0.05$). There was no significant difference in asthma control and FEV1 data between two groups. Patients with regular therapy had significantly higher ICSs current dose, compliance index level, more often made planned visits to their physician ($p<0.05$)

Table 1. Distinctions between mild persistent asthma groups

Parameter	1st group (n=57) Mean	2nd group (n=74) Mean	p
Asthma control by ACT test	19.7	18.7	0.518
FEV 1 data	87.6%	87.1%	0.814
ICSs current dose	328.75	150.8	0.000
Compliance Index	66.7%	51.6%	0.000
Take part in the educational program	44	18	0.000

We revealed that mild persistent asthma needs regular control visits to physician, taking part in educational asthma program (electronic one more often), plan of self-management in order to improve adherence and asthma control.

P887

Determining of predicting factors affecting disposition of patients with acute asthma referred to emergency ward

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Introduction: Acute asthma is associated with morbidity and mortality in patient referred to emergency department (ED). Our study was focused on simple objective measures in ED to predicting factors affecting disposition of patients with acute asthma referred to emergency ward.
Methods and materials: Data were collected prospectively at one center over 12-month period on 103 adult patients. Asthma step severity categorization and management was determined by GINA guidelines. Presenting ED vital signs, OSAT values, pulmonary function testing (spirometry, flow-volume loop, PImax, PEmax) and disposition were recorded for each study subject.
Results: In this study 103 patients were studied. In our patients 56 cases (%54.4) admitted and 47 (45.6) cases were discharged. There is no significant difference between admission rates and these variables: Age, Weight, Height, BMI (Body Mass Index), History of previous hospitalization, Living place (urban/rural), peripheral edema and some spirometric parameters; but significant difference were seen between admission rates and these variables: Functional stage of dyspnea, Pulsus Paradoxus, Intercostal retraction, Respiratory Rate (RR), Heart Rate, Arterial saturation of oxygen, Arteial pH. Variables that predict admission rates in our patients are as follows: Sex, RR and SaO2in first visit, PEmax in second measurement.
Discussion: Finding those variables that predict admission in asthmatic patients is very important and cost effective. We recommend further studies in this field, especially in measurement of new pulmonary function variables such as PImax and PEmax.
Key words: Asthma, emergency, PEmax

P888

Comparative efficacy of the therapy strategies for the asthma control maintenance in real clinical practice

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Introduction: Today there is no clear answer to the question which therapy regimen will be optimal for disease control maintenance in real clinical practice.
Aim: To compare the efficiency of strategies of control achievement from position of maintenance control in patients with persistent asthma in real clinical practice by ACT-test.
Methods: Multicenter prospective 24-week observation study was conducted in 19 centers in Russia. Investigator was only to record the changes of therapy prescribed by the attending physician. Patients were aposterior stratified into three groups: A – step-up regime of combined therapy (salmeterol/fluticasone propionate), B – stable regime, C – step-down regime.
Result: According to the inclusion criteria the patients in all groups had the uncontrolled disease course (ACT score <20). Of the 288 patients (50%) who achieved control in the first 3 months of observation, 263 (91.3%) persons maintained or increased the disease control level and only 23 (8.0%) of the patients "lost" the disease control. The ACT score decreasing to the uncontrolled level (<20 points) in group A and B was registered in 7.7% and 2.8% of cases, respectevely. The significantly biggest proportion of patients with the loss of asthma control was registered in group C - 24,3% (p<0,05). Declining therapy is associated with a decrease in the proportion of controlled patients and fold increase in the probability of loss of control.
Conclusion: Combined therapy at step-up and stable regimes are optimal in real clinical practice from position of maintenance control in patients with persistent asthma.

P889

Efficiency of different strategies of asthma control achievement in real clinical practice

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Introduction: Epidemiological studies registered the asthma control prevalence in the population at 5% on average but controlled studies showed that control achievement is possible in more than 70% of patients. There is no clear what part of asthma patients can have controlled asthma and which therapy regimen will be optimal in real clinical practice.
Aim: To compare the efficiency of strategies of control achievement in patients with persistent asthma in real clinical practice.
Methods: Multicenter prospective 24-week observation study was conducted in 19 centers in Russia. The following data were collected: ACT score, FEV1, therapy changes, number of emergency visits. The investigator was only to record the changes of therapy prescribed by the physician of patient. Patients were aposterior stratified into three groups: A – step-up regime of combined therapy (salmeterol/fluticasone propionate), B – stable regime, C – step-down regime.
Result: At the end of the observation disease control criteria in group A was achieved in 73,3% of cases, 69,4% in group B, and 58,5% in group C. The positive FEV1 dynamics was registered in the group A and group B – 6.4±1.5% and 5.0±1.5%, respectively. There was the negative dynamics of the FEV1 in group C (-8.2±2.8). Using of A and B strategies increased the probability of the full control achievement 3 times in comparison with the Group C (OR 3.27; 95%CI 1.48-7.35 and OR 3.36; 95%CI 1.53-7.54, respectively). Highest emergency visits frequency was registered in the group C (18,2%; Group A - 2.6% and B - 5.8% (p<0.001 vs A; p=0.01 vs B).
Conclusion: In the real clinical practice the use of combination therapy at step-up dose or in stable dose are optimal.

P890

Effect of whole body periodic acceleration on airway endothelial function in smokers, non-smokers and asthmatics

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Rationale: Cigarette smoking and asthma are associated with attenuated endothelium-dependent vasodilation in the airway. Endothelial shear stress activates endothelial nitric oxide synthase (eNOS), leading to endothelium-dependent vasodilation. It has been shown that whole body periodic acceleration (WBPA), activates eNOS. However, the effect of WBPA on endothelial function in the airway has not been investigated.
Objective: To assess the effect of a single WBPA session on beta-2 agonist induced, endothelium-dependent vasodilation (ΔQaw) in 15 current smokers, 15 never-smokers with asthma, and 15 healthy never-smokers, with the expectation that the treatment would transiently improve endothelial function.
Methods: ΔQaw was defined as the Qaw response to inhaled albuterol (180μg). Nitrite and S-nitrosothiol blood levels (NO) were assayed using a tri-iodide based reductive chemiluminescence method. All measurements were made before and immediately after a 45 minutes WBPA treatment using Exer-Rest®.
Results: WBPA increased mean baseline Qaw by 15.14±3.53 μl/min/ml in non-smokers (p<0.001) but had no effect on Qaw in smokers and asthmatics. ΔQaw remained unchanged in all three groups. NO levels tended to increase in asthmatics (13%) and non-smokers (31%), but the changes did not reach statistical significance.
Conclusions: A single session of WBPA increases airway blood flow in healthy non-smokers, but not in smokers and asthmatics. The treatment has no effect on the blunted endothelium-dependent vasodilation in smokers and asthmatics nor does it augment normal endothelium-dependent vasodilation in healthy non-smokers despite a tendency toward eNOS activation

P891

Successful implementation of an asthma care bundle in a UK hospital

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Introduction: A care bundle is a checklist of guidelines for clinicians. These have been successfully implemented in areas such as central line sepsis & ventilator-acquired pneumonia. We proposed that a care bundle would improve acute asthma care & outcomes by providing key clinical prompts. The 2009 British Thoracic Society (BTS) asthma audit highlighted areas for improvement, including PEFR and SpO2 documentation, inhaler technique review & use of written action plans.
Aims and objectives: To assess the impact of an asthma care bundle on concordance with UK asthma standards.
Method: A checklist sticker was created, piloted & implemented on acute medical wards, and the impact assessed using the 2010 BTS asthma audit.
Results: Pre- and post-care bundle results are shown in Table 1 (care bundle elements shown in bold)

Table 1. Summary of pre-bundle (2009) and post-bundle (2010) BTS audit outcomes

	2009 (n=32)	2010 (n=28)
Management on admission		
PEFR documented	71.9%	96.4%
SpO2 documented	87.5%	100%
ABG documented if SpO2 <92% on air	75.0%	92.3%
Hypercapnia on ABG	18.8%	7.7%
Systemic steroids within 4 hours of admission	69%	75%
Inpatient management		
Inhaler technique review	18.8%	85.7%
Discharged on oral corticosteroids	84.3%	100%
Preventer treatment increased on discharge	10.3%	38.1%
Discharge PEFR documented	68.8%	92.9%
Written action plan	6.3%	85.7%
Follow-up		
Hospital follow-up	71.9%	71.4%
Hospital follow-up within 4 weeks	87.0%	65.0%
Advice to see GP within 1 week	9.4%	14.3%

Conclusion: Use of the care bundle improved acute asthma care, particularly pre-discharge education & planning. Further work is needed to assess longer-term impact e.g. readmission rates, and the bundle is being revised in light of the latest audit data.

P892

Montelukast plus inhaled budesonide versus double dose inhaled budesonide in nonasthmatic eosinophilic bronchitis

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Background: Montelukast added to inhaled corticosteroids (ICS) has been demonstrated to relieve asthma symptoms and control airway inflammation equal to double dose ICS. However, the clinical efficacy of montelukast as add-on therapy to ICS has not been reported in nonasthmatic eosinophilic bronchitis (NAEB).
Objectives: Whether add-on therapy with montelukast to inhaled budesonide would equal double dose inhaled budesonide in alleviating cough and airway eosinophilia in adult patients with steroid-naïve NAEB was studied, the primary endpoints were changes of cough visual analogue score (CVAS) and eosinophil ratio in induced sputum (EOS) during treatment.
Methods: 26 nonsmoking subjects were randomized to receive either montelukast 10mg qd plus budesonide turbuhalor 200 μg bid (MONT-BUD) or budesonide turbuhalor 400 μg bid (BUD) for 4 weeks. CVAS, EOS at baseline, 1 week, 2 week and 4 week after treatment were measured. Adverse reactions were monitored.
Results: The two groups were comparable in age, median duration of cough and baseline CVAS. Median baseline EOS of MONT-BUD and BUD was 11.8% and 22.7%. Improvement of CVAS was more profound in MONT-BUD. In both groups EOS was normalized in both groups at end of therapy with similar EOS reduction at all time points. Both regimens were well tolerated.
Conclusions: This study demonstrated that the addition of montelukast to inhaled budesonide was an effective and well tolerated alternative to inhaled budesonide with resolution of airway eosinophilia and more remarkable reduction of cough in NAEB.

P893

Clinical course and outcome of patients with status asthmaticus in a tertiary care centre in Pakistan over the last ten years

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Objectives: To describe the clinical course and predictors of poor outcome in patients with status asthmaticus at a tertiary care centre in Pakistan.
Methods: Data was collected in patients aged 16 and above with status asthmaticus on demographics, co-morbids, home medications, APACHE II score, use of mechanical ventilation, length of hospital stay, complications, and mortality.
Results: A total of 46 patients were studied, 40 (87%) were females. The mean age was 54±21 years. Ventilatory support was required in 34 (73.9%) patients, 17 (50%) required non invasive (BiPAP) ventilatory support, and 17 (50%) required invasive mechanical ventilation.
Hospital course was complicated by cardiac arrhythmias in 7 (15%) patients, sepsis in 5 (11%) and pneumothorax in 1 (2%) patient.
Three (6.5%) died, 2 due to sepsis and 1 due to respiratory failure. All three non-survivors were females and required invasive mechanical ventilation. Mean APACHE II score was 9.30±4.39 vs 13.66±2.08, mean $PaCO_2$ was 53.83±23.07 mmHg vs 80.0±15.13 mmHg and arterial pH was 7.33±0.11 vs 7.21±0.09 among survivors and non survivors respectively.
Conclusion: Our study showed that requirement of ventilatory support was associated with prolonged hospital stay. High APACHE II scores, elevated $PaCO_2$, and decreased arterial pH on admission were associated with increased mortality.

P894

Fluticasone/formoterol combined in a single aerosol inhaler vs budesonide/formoterol for the treatment of asthma: A non-inferiority trial

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Background: Fluticasone (FLUT) and formoterol (FORM) are widely prescribed for asthmatics. A combination of FLUT/FORM in a single aerosol inhaler (*flutiform®*) has now been developed. This trial aimed to determine if FLUT/FORM is non-inferior to budesonide/formoterol (BUD/FORM; single inhaler) with regards to efficacy, and to assess safety, in adolescents and adults with moderate-to-severe persistent reversible asthma.
Methods: Eligible patients had an FEV_1 of ≥50% to ≤80% for predicted normal values and a ≥15% reversibility in FEV_1 following salbutamol (up to 400μg). 279 patients were randomised to FLUT/FORM 250/10μg b.i.d. (n=140) or BUD/FORM 400/12μg b.i.d. (n=139) in this 12 week, double-blind, 2-arm, parallel-group trial. The primary efficacy measure was change in morning pre-dose FEV_1 from baseline to Week 12.
Results: 261 patients completed (FLUT/FORM; n=133; BUD/FORM; n=128). Both treatment groups showed improvements in morning pre-dose FEV_1 from baseline to Week 12. FLUT/FORM was shown to be non-inferior to BUD/FORM because the lower limit of the 95% CI of the treatment difference (FLUT/FORM – BUD/FORM) was greater than the pre-defined threshold value of -0.2L (95% CI: -0.130, 0.043L). One patient on FLUT/FORM discontinued due to AEs (asthma exacerbation: not related) vs 3 patients on BUD/FORM (asthma exacerbation, acute sinusitis: not related; asthma exacerbation: possibly related).
Conclusions: Fluticasone/formoterol combination improved morning pre-dose FEV_1 over 12 weeks of treatment; demonstrated comparable efficacy to BUD/FORM with regards to this key lung function measure of asthma control and had a similar safety profile.

P895

Functional effects of long term ICS treatment in controlled asthma

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Background: Goal of asthma management is the "control" of the disease,monitoring symptoms and FEV1orPEF. However, in controlled asthma the persistence of a long term asymptomatic airway inflammation may lead to an accelerated functional decline.
Aim: To estimate the protective effect of a long term treatment with low dosage of ICS on functional parameters in controlled asthma
Methods: 98 asthmatic pts with ACT (Asthma Control Test) >20, nonsmokers were enrolled in a 3 yrs controlled randomized trial. Patients were divided in 2 groups: group A (49) (ICS) receiving a continuous treatment with inhaled beclomethasone MDI100mcg twice/die +inhaled salbutamol as needed; group B (49) (control) treated with inhaled salbutamol as needed. Step up therapy was performed as recommended by guidelines. Every 3 months, measures of FEV1, FVC, MEF, RV, TLC, FRC, ACT, PD20 (methacoline) were performed. Primary endpoint were: variation of functional parameters, PD20, and ACTscore
Results: Δ was the difference between time 0 and at 3yrs. Significant difference was reported for RV/TLC: A 30.9±3.2 (Δ+0.5), B 33.7±3.3 (Δ+2.5); PD20 (mcg): A 1232.5±301 (Δ+699), B 656.74±280 (Δ+55); FEV1/FVC at the attainment of PD20: A 64.2%±2.9 (Δ+0.4), B 67.6%±3.0 (Δ+4.9). No significant differences reported for FEV1 (A 3.94, B 3.86), FVC (A 5.27, B 5.15), FEV1/FVC (A 74.7%, B 74,9%), MEF25% (A 1.30, B 1.09), ACTscore (A 20.1, B 19.7), side effects (A 8, B 9).
Conclusion: A long term treatment with low dosage of ICS and the reduction of airway responsiveness are bound to a better preservation of the respiratory function in controlled asthma. It is probably due to a better control of a slight air trapping and asymptomatic involvement of small airways, as suggested by the greater decrease of FVC at PD20 in non treated group.

P896

Anti-immunoglobulin E antibodies may improve remodeling in a mouse model of asthma

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Recent studies have confirmed that omalizumab, an anti-immunoglobulin E (IgE) antibody, has a high response rate in patients with severe asthma who satisfy conditions such as the use of high-dose inhaled steroids and poor respiratory function. However, the effect of omalizumab on airway remodeling, a characteristic feature of chronic severe asthma, remains to be confirmed. In this study, we compared the effect of omalizumab with that of steroids in a mouse model of remodeling. BALB/c mice were continuously sensitized to ovalbumin to produce a model of remodeling. After the remodeling model had been prepared, four groups were studied: an IgE neutralizing antibody group (A), a steroid group (B), an IgE neutralizing antibody plus steroid group (C), and an untreated control group (D). Basement membrane thickening, used as a marker of remodeling, was found to be significantly inhibited in the group A, as compared with the other groups. The group B showed a trend toward inhibition of basement membrane thickening, but the effect was weaker than that in the group A. In the group C, basement membrane thickening was significantly suppressed in a synergistic fashion.
Airway remodeling, a characteristic of chronic severe asthma, was significantly inhibited by treatment with IgE neutralizing antibodies. Concurrent treatment with steroids was markedly effective. On the basis of these results, omalizumab is expected to be therapeutically effective for severe refractory asthma. The finding that treatment with steroids alone was less effective than combined treatment suggested that IgE neutralizing antibodies might also have a steroid-sparing effect.