In 2010, we conducted a second evaluation about the awareness of COPD in the Portuguese population, following a previous study in 2006. We aimed to analyze the impact on the awareness of COPD in the Portuguese population, of all actions taken during the last four years by Gold Committee in Portugal. Using the same questionnaire of 2006, we conducted a survey in 782 randomly selected General Practitioners with telephone line and ≥ 25 years old, both sexes. Results: 15.7% of the inquired people were smokers compared to 13.6% in 2006. Spontaneous awareness of COPD increased to 5.4% in the all group and 11.4% in the smokers vs 2.6% and 6.6% in 2006, respectively. The main reported disease associated with cigarette smoking was still lung cancer (72%). Like in 2006, asthma was the most often referred disease associated with respiratory insufficiency (54%), followed by chronic bronchitis (33%). Only 38% of smokers referred they have been informed by their physician about the damage of smoking (versus 29.9% in 2006). Not different from the previous survey there was a perception that the prevalence of the disease is increasing (57%). The population related COPD to cigarette smoking and considered COPD less serious than lung cancer, cardiovascular disease and AIDS. There is a growing interest on obtaining more information about COPD. The preferred way for obtaining information changed and is now the physician (37% vs 27%) and the media (31% vs 49%). Conclusion: COPD awareness of Portuguese population is increasing though remaining low. However there is a high interest in obtaining more COPD information, showing that there is plenty of room for further awareness programs. Supported with a grant from ALTANA Portugal-Nycomed Group.
for a new diagnosis of COPD was 4.6. COPD diagnosis was related to gender, age, BMI (p < 0.001), pack-years, and cough (p < 0.001), wheezeing (p < 0.001) and sputum production (p = 0.002). A threshold of 10% pre-test risk of COPD would have reduced the number of spirometry tests by 55% although 99% of the patients with COPD would still have been identified (NNS 3.9).

**Conclusion:** A case-finding strategy providing screening and diagnostic spirometry to high risk subjects in primary care identifies a large proportion of undiagnosed COPD patients, especially in the early stages of the disease.

### P4153

**Is spirometry screening useful for detecting undiagnosed COPD?**

Kart Levent, Sezer Murat, Karakose Fatma, Akkoyunlu Muhammet.

**Pulmonology, Bezmialem Vakif University, Istanbul, Turkey**

In BOLD Adam study COPD prevalence was 19.3% over 40 years of age but diagnosed COPD prevalence was 10% in 2004. Screening by spirometry might improve the detection of COPD. We aimed to answer the question that is the contribution of spirometry screening in early detection of COPD. We recruited to study adult visitors (age > 18 years of age) to spirometry test in our hospital garden during three days between 13 October 15 October 2010 (world spirometry day) for spirometry screening in Istanbul. We applied to the participants standard spirometry and questionnaire. 397 participant enrolled to the study. Mean age of study population was 43.9±11.8, 243 were female (56.2%) and 154 were male (38.8%). 151 were smoker (38%), 206 were nonsmoker (51%) and 40 were exsmoker (10.1%). 252 participants (63%) were over 40 years of age. Spirometry was performed in 224/252 and questionnaire was performed in 198/252 of people. In participant who were smoker and exsmoker (n=94 37%) FEV1/FVC ratio under 70% were 224/252 and questionnaire was performed in 198/252 of people. In participant who were smoker (38%), 206 were nonsmoker (51%) and 40 were exsmoker (10.1%).

On average, the FEV1/FVC ratio did not significantly decrease according to age among males (p=0.42), whereas it slightly increased among females (p=0.054). These preliminary results suggest that the reference equations obtained from younger populations cannot be used for the long-term survivors. Appropriate LLN equations will be computed when a greater sample size is reached.

**Background:** There are no preexisting reference for spirometry based on a randomly selected Canadian population.

**Objective:** To construct spirometric reference values for adults, aged 18-90 years, by combining data of healthy non-smokers from two population based studies: the Canadian Obstructive Lung disease [COLD] study and the Canadian European Community Respiratory Health Survey [ECRHS] Study.

**Method:** Spirometric lung function data were available from 302 subjects in the COLD study and from 2571 subjects in the Canadian ECRHS. Exploratory curves for the combined spirometric variables versus age were continuous and linear. We identified 844 [ages 40-90 years] and 812 [aged 18-44 years] healthy, asymptomatic, life-long non-smokers to provide normative reference values for spirometry. Multi-regression models were constructed separately for self-reported Caucasian men and women for FEV1, FVC, FEV1/FVC with covariates of height, sex and age.

**Results:** The summary for the best-fitting regression models for healthy never-smoking, asymptomatic men and women, 18-90 years old, are as follows:

<table>
<thead>
<tr>
<th>Sex</th>
<th>Parameter</th>
<th>Intercept</th>
<th>Age</th>
<th>Height</th>
<th>R-square</th>
<th>SEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>FEV1</td>
<td>-2.06961</td>
<td>-0.03167</td>
<td>0.04215</td>
<td>0.56109</td>
<td>0.50586</td>
</tr>
<tr>
<td></td>
<td>FVC</td>
<td>-5.39383</td>
<td>-0.02246</td>
<td>0.06550</td>
<td>0.45720</td>
<td>0.63557</td>
</tr>
<tr>
<td>Female</td>
<td>FEV1/FVC</td>
<td>-0.27977</td>
<td>-0.17794</td>
<td>0.35770</td>
<td>0.54656</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FVC</td>
<td>-1.68997</td>
<td>-0.02773</td>
<td>0.03537</td>
<td>0.64390</td>
<td>0.56973</td>
</tr>
</tbody>
</table>

**Conclusion:** These spirometry reference equations, derived from population-based cohorts with stringently monitored lung function measurements, provides data currently lacking in Canada.

### P4157

**Pulmonary resistance measured by impulse oscillometry system (IOS) seems to be related to self-reported COPD and respiratory symptoms**

Sophia Frantz1, Ulf Nilsson1, Magnus Dencker1, Gunnar Engstrom1, Claes-Göran Löfdahl2, Per Wollmer1, 1Clinical Physiology and Nuclear Medicine Unit, Department of Clinical Sciences, Lund University, Malmö, Sweden; 2Respiratory Medicine and Allergology Unit, Department of Clinical Sciences, Lund University, Lund, Sweden; 3Cardiovascular Epidemiology Research Group, Department of Clinical Science, Lund University, Malmö, Sweden

**Background:** COPD is considered to start with small airway disease, which is not readily detected by spirometry. Measuring pulmonary resistance by IOS may be a more sensitive technique and more closely related to respiratory symptoms.

**Aims and objectives:** This study aimed at examining pulmonary resistance mea-
Methods: 419 subjects (173 men/246 women), 46-78 years, who participated in a previous population-based study, were examined with spirometry and IOS (resistance at 5 Hz, resistance at 20 Hz (R20) and the difference between them (R5-R20)) and answered a questionnaire on respiratory symptoms and diseases. Results: 77 subjects had self-reported COPD and of them 34 subjects had COPD according to GOLD criteria. Of the 342 subjects with no-self reported COPD 90 subjects had COPD according to GOLD criteria. Subjects with self-reported COPD had higher pulmonary resistance than subjects with no self-reported COPD (R5 0.40±0.32 kPa/l/s, R20 0.28±0.24 and R5-R20 0.120±0.072, p<0.01 for all), both in subjects with (R5 0.40±0.33, R20 0.28±0.24, R5-R20 0.140±0.085, p<0.05 for all) and without spirometry verified COPD (R5 0.38±0.31, R20 0.28±0.24, R5-R20 0.110±0.068, p<0.05 for all). Respiratory symptoms, e.g. long-standing cough, were more commonly reported by subjects with self-reported than spirometry verified COPD (p<0.01).

Conclusion: Self-reported COPD is characterized by more respiratory symptoms and higher resistance measured by IOS, compared with spirometry verified COPD. High resistance may reflect early small airway disease better than spirometry.

P4158
Definition and validation of a predictive model to identify COPD patients from administrative databases
Lisa Bauleo, Nera Agabiti, Ursula Kirchmayer, Valeria Belleudi, Luigi Pinnarelli, Silvia Cascini, Danilo Fusco, Massimo Arcà, Marina Davoli. Department of Epidemiology, Regional Health Service, Lazio, Rome, Lazio, Italy

Background: Large administrative databases are increasingly used to identify patients with chronic conditions. However, the best methodology for Chronic Obstructive Pulmonary Disease (COPD) is still debated.

Objective: To develop and validate a predictive model to identify patients with COPD in Lazio region (6,252,105 residents over 45) linking clinical and administrative data.

Methods: From regional hospitalizations and drug prescriptions, through record linkage, we identified patterns of specific drug use (minimum 2 prescription during 12 months) and COPD hospitalizations during a 9-year period in 428 patients with COPD, who attended an outpatient clinic in 2006, and in 2140 people without COPD (selection from outpatients’ specialized health care registry). Through a Bootstrap-Stepwise procedure we analysed COPD-associated factors. We validated the algorithm through internal (cross-validation-bootstrap, jack-knife) and external validation (comparison with COPD patients with confirmed diagnosis).

Results: Prevalence of COPD was 7.8%. Factors associated with COPD were respiratory drugs, corticosteroids, oxygen, previous hospitalization for COPD and respiratory failure. For each patient we estimated an expected probability to suffer from COPD. Depending on the cut-point of expected probability, sensitivity ranged from 74.5% to 99.6%, specificity from 37.8 to 86.2%. We defined a cut-point of 0.30 to identify COPD patients. Applying our algorithm on external COPD patients we succeeded to identify 70%.

Conclusion: The predictive model showed good performance to identify COPD patients confirming the strength of administrative data for monitoring chronic diseases.

P4159
Respiratory symptoms, smoking history and airflow limitation: How should we define COPD?
Lowie Vanfleteren1, Frits Franssen 2, Gernot Rohde 1, Emiel Wouters 1.

Methods: COPD (N = 135) and asymptomatic (N = 10,7, 300 male (50,8%)) completed questionnaire assessing respiratory symptoms, smoking history and airflow limitation. For the COPD subjects confirming the strength of administrative data for monitoring chronic diseases.

Results: Among 11,647 patients with GOLD COPD, who attended an outpatient clinic in 2006, and in 2140 people without GOLD COPD (selection from outpatients’ specialized health care registry). Through a Bootstrap-Stepwise procedure we analysed COPD-associated factors. We validated the algorithm through internal (cross-validation-bootstrap, jack-knife) and external validation (comparison with COPD patients with confirmed diagnosis).

Conclusion: The predictive model showed good performance to identify COPD patients confirming the strength of administrative data for monitoring chronic diseases.

P4160
Dyspnoea, obstruction, smoking and exacerbation (DOSE) index and mortality in COPD
Josefin Sundström 1, Christer Janson 1, Karin Lisspers 1, Björn Ställberg 1, Scott Montgomery 3, 1Department of Respiratory Medicine, Orebro University Hospital, Orebro, Sweden; 2Department of Medical Sciences, Respiratory Medicine and Allergology, Uppsala University, Uppsala, Sweden; 1Department of Public Health and Caring Science, Family Medicine and Clinical Epidemiology, Uppsala University, Uppsala, Sweden; 3Clinical Epidemiology and Biostatistics Unit, Orebro University Hospital, School of Health and Medical Science, Orebro University, Orebro, Sweden

Introduction: The DOSE index was designed to assess disease severity and for clinical management of COPD, but has not been evaluated as a prognostic instrument for mortality. This study investigated associations with all-cause mortality. Methods: A total of 1548 patients, aged ≥45 years, were randomly selected from 70 Swedish primary and secondary care centers. Information was collected using questionnaires and record review. The Swedish Board of Health and Welfare provided mortality data. The DOSE index was calculated using the MCR dyspnoea scale, FEV1 as percent of predicted (FEV1%), smoking status and exacerbation rate. Information on exacerbation rate over the last six months was used to estimate the annual rate. Some 527 patients, aged 34-75 years, were included in Cox regression analyses to estimate survival with adjustment for age, sex and heart disease.

Results: Over five years, 110 patients (20.9%) died. Mortality was higher in patients with DOSE index ≥4, than for lower scores (42.7% vs 10.4%). This produced a hazard ratio (HR) of 4.45 (95%CI 2.99 to 6.64) after adjustment for age, sex and heart disease. When investigating the separate components in the DOSE index, the HR for a unit change in the DOSE index components was 1.81 (2.14 to 1.43) for MCR; 2.27 (1.72 to 2.92) for FEV1%/pred. (0.98 to 1.04) for smoking status and 1.72 (1.36 to 2.17) for exacerbation score; all after adjustment for age, sex and heart disease. The associations with mortality for the separate components were statistically significant when these measures were included simultaneously in the same model.

Conclusion: The DOSE index is associated with mortality in COPD patients.

P4161
Determination of COPD characteristika via unsupervised clustering of the ECLIPSE cohort
Stephen Rennard1, Bruno Delaflon2, Nicholas Locantore1, Alvar Agusti3, Peter Calverley1, Edwin Silbermann, Ruth Tal-Singer1, Jorgen Vestbo1. 1University of Nebraska Medical Center, University of Nebraska, Omaha, NE, United States; 2Department of Statistics, Boehringer-Ingelheim, Paris, France; 3Respiratory Medicines Development, GlaxoSmithKline, RTP, NC, United States; 4Institut des Toxic, CIBER Enfermedades Respiratorias and Fundacion Cuabeta-Cimera, Barcelona, Spain; 5Department of Respiratory Medicine, University of Liverpool, Liverpool, United Kingdom; 6Pulmonary and Critical Care Division, Brigham and Women’s Hospital, Boston, MA, United States; Respiratory Center of Drug Development, GlaxoSmithKline, Philadelphia, PA, United States; 7Cardiology and Respiratory Medicine, Hvidovre Hospital and University of Copenhagen, Copenhagen, Denmark

Background: Identifying clinically meaningful groups of COPD patients is a crucial goal to explore COPD heterogeneity. We attempt to define groups using unsupervised clustering methods.

Methods: Data from the 2164 COPD patients in the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) study were assessed. Using forty-one baseline variables describing demographic, clinical, quality of life, laboratory and biomarker values, twelve factors were identified via factor analysis that accounted for 61% of the variance in the data set. The variables with the highest loadings for those factors were used to define five patient groups using unsupervised clustering, and relationships to longitudinal outcomes were assessed.

Results: Demographic profiles are shown in table 1. Over three years, higher mortality was seen in Cluster 2 (characterized by higher comorbidity and BMI despite FEV1 values that were not substantially lower than other groups) and Cluster 5, characterized by more airflow limitation.

Baseline Characteristics and Longitudinal Outcomes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cluster 1 (n=117)</th>
<th>Cluster 2 (n=423)</th>
<th>Cluster 3 (n=204)</th>
<th>Cluster 4 (n=198)</th>
<th>Cluster 5 (n=321)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>63 (7)</td>
<td>64 (7)</td>
<td>64 (7)</td>
<td>63 (6)</td>
<td>63 (7)</td>
</tr>
<tr>
<td>% Females</td>
<td>42</td>
<td>13</td>
<td>34</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>% Current Smokers</td>
<td>25</td>
<td>35</td>
<td>25</td>
<td>31</td>
<td>22</td>
</tr>
<tr>
<td>FEV1%pred</td>
<td>49 (15)</td>
<td>51 (15)</td>
<td>55 (15)</td>
<td>51 (17)</td>
<td>38 (13)</td>
</tr>
<tr>
<td>BMI (kg/m^2)</td>
<td>25 (5)</td>
<td>32 (6)</td>
<td>26 (4)</td>
<td>27 (6)</td>
<td>24 (4)</td>
</tr>
<tr>
<td>Died within 3 yrs</td>
<td>13</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table values are mean (SD) or %

Conclusion: Unsupervised cluster analysis identified 5 groups of COPD patients
Thematic Poster Session

Hall 2-31 - 12:50-14:40

Tuesday, September 27th 2011

in ECLIPSE that differ in their baseline demographics and outcomes over 3 years. These may represent subtypes of COPD.

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P4162 Asthma with and without sinusitis, results from the Swedish GA²LEN study

Roeinide Middeldelft1, Alexandra Ek1, Bertil Forsberg2, Bo Lundbäck3, Sven-Erik Dahlén1, Christer Janson1, 1The Centre for Allergy Research Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; 2Department of Occupational and Environmental Medicine, Umeå University, Umeå, Sweden; 3Department of Internal Medicine, University of Gothenburg, Gothenburg, Sweden; 4Department of Medical Sciences, Uppsala University, Uppsala, Sweden

Introduction: In order to study the consequences of having both asthma and sinusitis compared to having asthma only, four Swedish centres studied cohorts of asthmatic patients (A), and asthma+sinusitis patients (AS). The study was part of the Global Allergy and Asthma European Network (GA²LEN) survey and follow-up.

Methods: Participants in the survey were invited for a clinical follow-up visit for interviews, and measurements of lung function, fraction of exhaled nitric oxide (FeNO) and quality of life. Group allocations were based on the interviews. A was defined as self-reported diagnosis of asthma and presence of at least one asthma symptom or use of asthma medication. AS was defined as having asthma as well as at least two sinusitis symptoms, providing that nasal blockage or nasal discharge were reported.

Results: A consisted of 470 subjects (mean age 44, BMI 27, 60% females) and AS of 130 subjects (mean age 45, BMI 27, 57% females). AS had lower FEV1/FVC, FVC% and quality of life (mini Asthma Quality of Life Questionnaire-AQLQ), compared to A. There were no differences in FeNO, FEV1/FVC1 and reported nasal allergies.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Asthma</th>
<th>Asthma + Sinusitis</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV1% pred (95% CI)</td>
<td>91.8 (90.2-93.4)</td>
<td>88.4 (85.8-91.8)</td>
<td>0.04</td>
</tr>
<tr>
<td>FVC % pred (95% CI)</td>
<td>102.4 (100-104.4)</td>
<td>99.9 (98.6-103.0)</td>
<td>0.01</td>
</tr>
<tr>
<td>FEV1/FVC (%) (95% CI)</td>
<td>74.8 (71.9-77.5)</td>
<td>73.8 (71.8-75.7)</td>
<td>ns</td>
</tr>
<tr>
<td>FeNO (median, ppb (IQR range)</td>
<td>18 (12-29)</td>
<td>17 (12-32)</td>
<td>ns</td>
</tr>
<tr>
<td>MiniAQLQ-SSD</td>
<td>6.0±1.9</td>
<td>5.4±1.2</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Conclusion: We conclude that having both asthma and sinusitis results in lower lung function and lower quality of life compared to having asthma only.

P4163 Statistical cluster analysis on the BTS refractory asthma cohort

Chris Newby1, Liam Heaney2, Andrew Menzies-Gow2, Rob Niven3, Chris Brightling1. 1Department of Infection, Inflammation and Immunity, Institute for Lung Health,University of Leicester, Leicester, United Kingdom; 2Centre for Infection and Immunity, Queen’s University, Belfast, United Kingdom; 3Royal Brompton Hospital, Royal Brompton Hospital, London, United Kingdom; 4North West Lung Centre, University of Manchester, Manchester, United Kingdom

Introduction: Severe asthma is no longer believed to be a single homogeneous condition but rather a heterogeneous disease possibly containing subsets of patients. A number of clustering algorithms have been carried out on various datasets of asthmatic patients, and at least two sinusitis symptoms, providing that nasal blockage or nasal discharge were reported.

Results: A consisted of 470 subjects (mean age 44, BMI 27, 60% females) and AS of 130 subjects (mean age 45, BMI 27, 57% females). AS had lower FEV1/FVC, FVC% and quality of life (mini Asthma Quality of Life Questionnaire-AQLQ), compared to A. There were no differences in FeNO, FEV1/FVC1 and reported nasal allergies.

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<td>6.0±1.9</td>
<td>5.4±1.2</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Conclusion: We conclude that having both asthma and sinusitis results in lower lung function and lower quality of life compared to having asthma only.

P4164 The comparison of early and late onset asthma among elderly asthmatics

Bulent Bozkurt, Hale Saha, Duygu Orul, Zeki Yildirim. Dept. of Chest Diseases, Fatih University, School of Medicine, Ankara, Turkey

Introduction: Asthma is important cause of morbidity and mortality in elders. There are significant effects on the long standing influence on health care utilization, frequent hospitalization, treatment side effects, and remodeling.This study aims to compare clinical characteristics of early and late-onset elderly asthmatics.

Method: A retrospective study was conducted in 116 elderly asthmatics admitted to Fatih University,Dept of Chest between January 2008-2011. Onset of asthma was the year when dyspnea firstly appear (cut-off age for onset: 65).

Results: Mean age of patients was 73±6.2 years and 23of them were male. 21.6% of patients were smoker. 19% of patients had allergic rhinitis. 3.4% of the patients had complete asthma control.Main systemic disease was hypertension (69.8%). There were 48 early-onset and 68 late-onset asthmatics. Cough (2.7 (95% CI:1.2-4.3)) and spurt production (3.3 (95% CI:1.5-7.7) were more frequent in late onset asthmatics. Medications were rarely prescribed (0.075 (95% CI:0.02-0.19) in late-onset asthmatics. Theophylline (0.18 (95% CI: 0.04-0.89) and salbutamol (0.21 (95% CI: 0.07-0.65) were rarely used in late-onset asthma. Future studies may give better understanding of etiopathogenesis of early and late-onset asthma.

Conclusion: Desired clinical outcomes may be more difficult to achieve in elderly asthmatics due to comorbid conditions, cognitive and financial status. Chronic cough with spurt is not unusual in elderly with asthma, although it is usually associated with smoking, chronic bronchitis, and several conditions in late-onset asthmatics. Risk of adverse effects of treatment increases with increasing age and often limits choice and frequency of medications; moreover theophylline and salbutamol are rarely prescribed to patients with late-onset asthma. Future studies may give better understanding of etiopathogenesis of early and late-onset asthma.

P4165 Wheezing in morbidly obese patients is not always due to asthma

Ardan van Huystede1, Arjan Rodolphus1, Hans Ziegler, 1Centre for Infection and Immunity, Queen’s University, Belfact, United Kingdom; 2Department of Surgery, Sint Franciscus Gasthuis, Rotterdam, Netherlands; 3Department of Clinical Chemistry, Sint Franciscus Gasthuis, Rotterdam, Netherlands; 4Department of Pulmonology, Leiden University Medical Center, Leiden, Netherlands

Background: Morbid obesity is becoming a world wide epidemic. Morbidly obese patients are at risk for asthma. The aim of the study: To investigate the differences in symptoms and lung function test in morbidly obese patients with and without asthma.

Methods: A group of 93 morbidly obese patients (BMI=35 kg/m2, age 18-50y) was studied. Asthma was defined as the presence of reversible airway obstruction (AFEV1>12%) and/or PC20 methacholine of <8 mg/ml. Patients with a physician diagnosis asthma, but not fulfilling the criteria of late-onset asthma after stopping ICS were defined as “asthma-like symptoms” (asthma-l.s.).

Results: 29 patients fulfilled the criteria of asthma, 14 had asthma-l.s., and 50 control group patients. Sex, age, BMI, smoking, abdominal circumference, atopy, FeNO, FVC, DLCO, Eppworth Sleepiness Scale score, GERD questionnaire and steps a day did not differ between the groups. Patients with asthma or asthma-l.s. had significantly more symptoms (wheezing [p<0.001], coughing [p<0.001]), and significant worse AQLQ-scores (mean 5.7 points [p<0.004], 5.5 points [p<0.002] respectively) and ACT-scores (mean 1.1 points [p<0.000] and 1.0 points [p<0.015] respectively) compared to controls (AQLQ 6.5 points, ACT 0.3 points). Patients with asthma had a significantly lower FEV1 (86% pred) and FEV1/FVC (76% pred) than the group with asthma-l.s. (105%pred [p<0.001], and 83%pred [p<0.001] respectively) and the control group (97%pred [p<0.001], and 81%pred [p<0.001] respectively).

Conclusion: A significant proportion of the patients with morbid obesity and a history of asthma does not fulfill the criteria of asthma. These patients have the same symptom scores as “asthma-like symptoms” asthmatics, despite supranormal lung function parameters.

P4166 Incidence of asthma and wheeze during adolescence – The impact of study design

Linnea Hedman1,2, Anders Bjerg1, Sigrid Sundberg1, Eva Ronmark1,2, 1The OLIN Studies, Norbotten County Council, Luleå, Sweden; 2Public Health and Clinical Medicine, Occupational and Environmental Medicine, Umeå, Sweden

Aim: To study the impact of study design on the incidence rates of asthma and wheeze during the teen ages.

Method: In a longitudinal study about asthma and allergic diseases within the OLIN studies in northern Sweden, a cohort of school children (n=3,430) was followed annually from age 7.8 yrs by completion of an extended ISAAC questionnaire. In the endpoint survey (age 19yrs) 2,861 (83% of original responders) participated. Incident cases of asthma and wheeze from age 12 to 19yrs were identified by two methods: the annual questionnaire surveys and the endpoint survey only, respectively.

Results: The incidence was consistently higher when the incidence was based on annual surveys compared to the endpoint survey only. Based on the endpoint survey, the average annual incidence of current asthma, physician-diagnosed asthma

763s

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and ever asthma was 0.7-1.4/100y and current wheeze was 1.5/100y. Based on the annual surveys, the incidence of asthma was 0.9-2.7/100y and current wheeze 3.6-5.3/100y. In both study designs, the incidence of asthma and wheeze was higher among girls than boys (p-values<0.01). At the onset, the additional cases of current asthma identified by the annual surveys had slightly less severe asthma than those identified only in the endpoint survey (p<0.006).

Conclusion: The incidence of asthma and wheeze was affected by study design. The incidence was underestimated when only baseline and endpoint data was used. Study design and follow-up time is important to consider for comparisons of the incidence of asthma and wheeze between studies.

P4167 Reproducibility of an asthma symptoms and rescue medication diary: Paper and AM3™ modes
Andrea Ireland1, Ingela Wiklund2, Peter Dale3, Ray Hoebe4, Erin O’Rourke1
1GES, United BioSource Corporation, Bethesda, MD, United States; 2Health Care Analytics, United BioSource Corporation, Bethesda, MD, United States; 3Global Health Outcomes, GlaxoSmithKline, Stockley Park, Uxbridge, United Kingdom; 4Biostatistics and Data Analysis, United BioSource Corporation, Bethesda, MD, United States

Objective: This study investigated the test-retest reliability of a twice-daily (morning and evening) asthma symptoms and rescue medication diary within two modes of administration: 1) paper-and-pencil; and 2) AM3™ electronic device in patients with persistent asthma.

Methods: Prospective cross-over study where key inclusion criteria were Asthma Control Test (ACT) scores ≥16, ICS with or without LABA use, <2 nocturnal awakenings due to asthma (past week), and activity limitations ≤1 per week. Participants were randomly allocated to complete the diary in each mode for 15 days. Spirometry was performed at randomisation, cross over, and end of study and changes in asthma resource use were captured. Weekly percentage of symptom-free days (SFD) and rescue-free days (RFD) were calculated using diary data. Intraclass correlation coefficients (ICC) of mean Week 1 SFD and RFD (test) and Week 2 mean SFD and RFD (retest) were estimated for three groups of stable participants: 1) patient who reported little or no change in asthma symptoms and rescue use at Day 15; 2) <±15% change in FEV1 (k); and 3) ACT change scores <18 (final visit versus baseline).

Results: The mean age of the participants (n=50) was 36.5±17.5 years. Independent of mode of administration, SFD demonstrated acceptable test-retest reliability (ICC ≥0.70) based upon all three definitions of asthma stability. By comparison, acceptable reproducibility of the percentage of RFD (ICC 0.78) was only observed for the electronic diary using the FEV1 stability criterion.

Conclusion: This study provides evidence of the test-retest reliability of SFD and RFD diary as well as concordance between the two modes of administration. Funded by GSK

P4168 Exclusion of asthma for screening purposes using exhaled air molecular profiling by electronic nose
N. Fens1, Y. Gaarthuis2, A.C. Bos3, N.J.J. Schlösser2, P.J. Sterk1
1Respiratory Medicine, Academic Medical Center, University of Amsterdam, Amsterdam, Netherlands; 2Pulmonology, Central Military Hospital, Utrecht, Netherlands; 3Research & Development, C-it, Zutphen, Netherlands

Background: Asthma is presently diagnosed by its clinical presentation, including the presence of dyspnea, cough, chest tightness and wheezing (GINA). When combined with bronchal challenge testing, asthma can be assessed with high accuracy. Excluding asthma is the primary objective when screening for military service. Profiles of exhaled compounds as measured by electronic nose (eNose) could be a rapid non-invasive test for this purpose.

Hypothesis: Exhaled breath molecular profiles measured by eNose can be used to exclude asthma in a screening setting for military recruits.

Methods: Military recruits (16-27 yr, mean 19.8; M/F 64/11) were included in a cross-sectional study. Exhaled breath samples were measured by DiagNose eNose (C-it, Zaapth, NL). Symptoms of asthma were assessed by validated questionnaires (Burkey et al, ERJ ‘94) and a histamine challenge test was performed. Asthma was considered to be present when both symptoms and PC20<8 were present (gold standard). ROC analysis was performed to assess optimal specificity.

Results: 75 recruits were included, of which 21 had a gold standard diagnosis of asthma. ROC analysis of exhaled breath profiling resulted in an AUC of 0.70 (p=0.007).

Conclusion: Exhaled breath molecular profiling using an eNose can be a suitable screening instrument to exclude asthma in young, otherwise healthy military recruits.