405. Methodology in epidemiologic research

P3956

Estimating parameters in the two-compartment model of exhaled nitric oxide <u>Sandrah Eckel</u>¹, William Linn^{1,2}, Kiros Berhane¹, Muhammad Salam¹, Edward Rappaport¹, Yue Zhang¹, Frank Gilliland¹. ¹Preventive Medicine,

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Introduction: The fractional concentration of exhaled nitric oxide (FeNO) is a biomarker of airway inflammation. FeNO decreases with increasing flow, which has led to the development of mathematical models whose parameters quantify proximal and distal sources. FeNO measured at the conventional 50 ml/s flow rate is primarily from proximal sources, so the parameters may provide additional insight. Parameters are estimated from FeNO data measured at multiple flow rates, but there is no standard estimation method.

Aims and objectives: To evaluate and compare a comprehensive set of existing and novel regression-based estimators of parameters from the two-compartment model of exhaled nitric oxide.

Methods: We used simulated multiple flow datasets to assess the statistical properties of the estimators and multiple flow datasets from 1507 schoolchildren from the Southern California Children's Health Study (CHS) to investigate regression model fit and the sensitivity of estimates across models.

Results: A novel non-linear least squares model with log transformation fit CHS participant datasets very well (median adjusted R2 = 0.99), satisfied model assumptions (homoskedasticity), and produced estimators with good statistical properties (e.g., negligible bias). In the CHS, alveolar NO concentration (CaNO) estimates were only moderately correlated across estimation methods whereas bronchial flux estimates were highly correlated.

Conclusions: Since CaNO estimation is a key result of multiple flow FeNO analysis, the sensitivity of CaNO estimates highlights the need for standardized methods. No gold standard is available to validate parameter estimators but our work can guide the selection of estimators in future studies.

P3957

Screening for alpha-1 antitrypsin deficiency in Germany – Update 2012

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Background: Alpha-1 antitrypsin deficiency (AATD) is characterized by decreased serum levels of alpha-1 antitrypsin (AAT). The most common clinical manifestations are pulmonary emphysema and liver cirrhosis. Epidemiological estimates postulate around 8000 people in Germany with a severe AATD. Although current guidelines stress the importance of screening for AATD, the majority of patients remains undetected.

Aim: To provide recent screening data from the German central laboratory for AATD in Marburg, Germany.

Methods: From dried blood spot (DBS) samples we performed AAT measurements (for internal use only) and genotyping for S and Z alleles. When either of both tests was suggestive for AATD we went on to perform phenotyping by IEF. When phenotyping resulted in bands suggestive for rare deficiency alleles we conducted complete sequencing of the AAT gene.

Results: In the period from August 2003 to February 2012 more than 50.000 test kits had been requested of which 13.010 kits have been returned. Of these, 75 were not evaluable, and 185 samples had already been submitted before. Our results are based on 12.750 analyzed samples.

In descending order of frequency, we have diagnosed the following phenotypes: PIMM (8577, 67.27%), PiMZ (2383, 18.69%), PiZZ (846, 6.64%), PIMS (637, 4.99%), PiSZ (192, 1.51%), PiSS (38, 0.29%). 140 samples were submitted to gene sequencing. Here we found 75 rare (R) genotypes (PiZR 59; PiMR 10; PiSR 4; PiRR 2).

Conclusion: Almost a third (32.73%) of the submitted samples was found to represent at least a carrier status, and over 8% carried a genotype that is associated with a severe AATD. We conclude that screening is useful to detect AATD and should be expanded in Germany.

P3958

Normality ranges of urine oxidative stress markers (8-OHdG and isoprostane) in Italian people free from respiratory diseases – Preliminary results

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Background: The study of oxidative stress (OxS) is becoming increasingly im-

portant in respiratory disease research. To our knowledge, the reference ranges of urinary 8-hydroxy-deoxy-guanosine (8-OHdG) and 8-isoprostane (isoprostane), a DNA and a lipid oxidation product respectively, have not yet been determined in subjects without respiratory diseases.

Aim: To assess the reference range of OxS markers in Italian people aged 20-64 free from respiratory diseases (controls).

Methods: 8-OHdG and isoprostane were measured in spot-urine samples collected in the frame of Gene-Environment Interactions in Respiratory Diseases (GEIRD) study, a nested multi-case control survey. The biomarkers levels were corrected on creatinine concentration. Only controls (n=239) were considered for the aim of this work. The possible effects of potential determinants on OxS-biomarkers were studied before determining the normality range in selected subgroups of controls. Multiple linear regression was fitted to data using the logarithm of 80HdG or isoprostane as dependent variables and sex, age, season, smoke, body mass index, as covariates. The appropriate percentiles were calculated.

Results: Both 8OHdG and isoprostane concentrations were significantly higher in smokers than in non smokers (p=0.025 and 0.047 respectively), while the other covariates did not influence OxS. The 95% 8OHdG normality range in non smokers varied from 0.26 to 25.94 ng/mg. The 95% isoprostane reference interval was 0.03 -5.42 ng/mg in non smokers.

Conclusion: Provisional 95% normality range for urinary 8OHdG and isoprostane were determined in subjects free from respiratory diseases.

P3959

Levels of cat, grass and mite specific IgE and symptoms on specific exposure <u>Mario Olivieri</u>¹, Joachim Heinrich⁵, Dan Norbäck⁴, Simona Villani⁵, Josep M. Antó⁶, Giuseppe Verlato². ¹Unit of Occupational Medicine, University Hospital, Verona, Italy; ²Unit of Epidemiology & Medical Statistics, Dept. of Public Health & Community Medicine, University of Verona, Italy; ³Institute of Epidemiology, GSF-National Research Center for Environment and Health, Neuherberg, Germany; ⁴Department of Medical Science/Occupational and Environmental Medicine, Uppsala University, Uppsala, Sweden; ⁵Department of Public Health, Neurosciences, Experimental and Legal Medicine, University of Pavia, Italy; ⁶Centre for Research in Environmental Epidemiology, (CREAL), Barcelona, Spain

Objective: To investigate the association between specific IgE levels to different allergens and symptoms on specific exposure.

Methods: In the frame of the European Community Respiratory Health Survey II specific IgE to cat, timothy grass and house dust mite were assessed in 8409 subjects. Participants were asked whether they presented cough, wheeze, chest tightness, breath shortness, runny or stuffy nose, itchy or watering eyes on exposure to: *animals such cats or dogs; trees, grass, flowers, or pollen; a dusty part of the house, or near pillows or duvets.*

Results: A clear dose-effect relationship was found between IgE levels to cat, grass and mite, respectively, and symptoms on exposure to animals, pollen and dust (Table 1). The relation between mite sensitization and symptoms on dust exposure was less steep. A similar pattern was observed when evaluating the number of symptoms on exposure: the Spearman's rho was, respectively, 0.45, 0.45 an 0.19 when considering the relation between sensitization to cat, grass and mite and number of symptoms on specific exposures.

Table 1. Percent prevalence of symptoms on exposure to animals, pollen and dust, respectively, as a function of IgE levels to cat, timothy grass and house dust mite

Specific IgE levels (kU/L)	Symptoms on exposure to animals	Symptoms on exposure to pollen	Symptoms on exposure exposure to dust
< 0.35	11 (762/6818)	24 (1622/6624)	28 (1758/6352)
0.35-0.69	41 (76/186)	54 (106/198)	39 (115/296)
0.70-3.49	71 (234/328)	65 (315/488)	45 (208/464)
3.50-17.4	82 (187/227)	87 (455/526)	58 (190/328)
≥17.5	82 (68/83)	92 (305/332)	66 (129/196)

Conclusion: Both the prevalence and the number of allergic symptoms on specific exposure increase with increasing specific IgE levels.

P3960

Candidate gene association study of chronic obstructive pulmonary disorder using a targeted high throughput sequencing approach

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Background: Genetic studies in humans and in animal models suggest that genes associated with lung developmental processes are also implicated in the development of COPD.

Aim: We aim to investigating candidate genes, with emphasis on genes important for lung development, for genetic variants predisposing to the development of chronic obstructive pulmonary disease (COPD) using targeted enrichment in a cohort of COPD patients.

Methods: Twelve patients with heterozygous loss of function mutations in a lung

developmental gene, the fibroblast growth factor 10 (*FGF10*), was investigated for pulmonary functions and COPD was classified according to the ATS/ERS 2005 standard. To identify novel variants associated with COPD, we are currently conducting a candidate gene association approach using targeted enrichment (Halo-Plex; Halo Genomics) and high throughput sequencing (Illumina) using patients and controls retrieved from the Swedish Obstructive Lung Disease in Norrbotten (OLIN) sample set. This strategy allows for the detection of all genetic variants in the enriched sequence, without the limitations when investigating known variants using SNP arrays.

Results: Patients carrying mutations in FGF10 show a significant decrease in lung function parameters consistent with COPD. Based on these results, we are currently investigating in total 200 kb enriched sequence, including 22 genes implicated in lung development and 71 genes or regions previously associated to COPD.

Conclusion: These findings support the idea that genetic variants affecting lung developmental genes are important determinants of adult lung function that may ultimately contribute to COPD.

P3961

The efficacy of COPD detection by using a community-based annual screening program for lung cancer

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Study objectives: The aim of this study was to clarify the usefulness of COPD screening by using a community-based lung cancer screening program.

Methods: In Japan, community-based lung cancer screening by chest X-ray has been established. Japanese residents who are 40 years old or higher can freely receive chest X-ray every year. We utilized this screening system in Chiba City in order to detect COPD. From April 2010 to March 2011, 83,924 participants received regular lung cancer screening by chest X-ray at the first examination centers, which was approximately 30% of objective residents. We set the criteria of suspicious of COPD indicating 60 years or older, positive smoking history and having any chronic respiratory symptoms. 1,170 (1.3%) were recognized as suspicious of COPD and 551 of them (56.2%) received further examination including pulmonary function test (PFT) and/or chest computed tomography (CT) as the second close examination at 39 second examination centers.

Results: 138 participants (25.0%) were reported as COPD from the second examination centers and 42.2% of them were necessary for COPD treatment. Only eight participants (5.8%) were already diagnosed COPD before screening. PFT data could be collected from 173 participants, and 43 (24.9%) were diagnosed as COPD (FEV1 less than 70%). Emphysema grades according to Goddard classification on CT revealed that 21.1% was radiological emphysema. One patient with normal chest X-ray was detected lung cancer by CT and could receive curative surgery.

Conclusion: COPD screening by using a community-based lung cancer screening program may be effective for detection of COPD. These patients can be treated COPD as early as possible.

P3962

Computed tomography of the paranasal sinuses in chronic obstructive pulmonary disease

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Background: Pathologic correlates of the upper airways have been rarely evaluated in chronic obstructive pulmonary disease (COPD).

Aims: Assessment of objective and subjective impairment of the upper airways in COPD

Methods: Computed tomography (CT) of the paranasal sinuses was performed in patients with COPD and evaluated using the Newman scoring system (>0 points considered abnormal). Nasal endoscopy was performed and scored according to Lund and Kennedy (>1 point considered abnormal). Rhinosinusitis related quality of life and symptoms were assessed with the Sino Nasal Outcome Test-20 (SNOT-20) (>12 points considered abnormal) and the SNOT-primary nasal symptoms score (SNOT-PNS). Spirometry was performed according to established guidelines. Patients were classified into COPD risk groups according to the GOLD guidelines of December 2011 considering symptoms, COPD stages 1-4 and exacerbations.

Results: We included 83 patients (35 women) with a mean age of 68 years (range: 44-90). 29 subjects (35%) were in COPD risk group A, 38 subjects (46%) in risk group B and 16 subjects (19%) in risk groups C and D. Abnormal CT scores were observable in 49 subjects (59%) and abnormal results in the SNOT-20.

We found a positive correlation between the CT score and the SNOT-PNS (r=.22, p<.05). The endoscopic score correlated positively with the SNOT-PNS (r=.29, p<.05) as well as with the SNOT-20 (r=.42, p<.01). Subjects in higher risk groups presented higher scores in endoscopy (p<.05), SNOT-PNS (p<.05) and SNOT-20 (p<.01).

Conclusion: Pathologic correlates of the upper airways were found in more than half of the patients with COPD.

P3963

Waist circumference and lung function among adolescents: The Pelotas 1993 birth cohort

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Background: BMI is frequently used to evaluate obesity, but it is unable to assess fat distribution. Much attention has been given to abdominal fat measured by waist circumference (WC). Abdominal fat is a known risk factor for chronic diseases, but the impact of lung function among adolescents remains uncertain.

Objective: To evaluate the association between WC and lung function parameters among adolescents.

Methods: The original cohort comprised 5,249 hospital born children during the calendar year of 1993 in Pelotas, Brazil. In 2008-9, when participants were 15 years old, all cohort members were evaluated. WC was measured by trained interviewers and lung function tests were performed to obtain FVC and FEV1. Multiple linear regression models were performed and all analyses were stratified by sex.

Results: 1,969 boys and 2,032 girls had data for spirometry and for WC. In the crude analyses we found a positive relationship between WC and FEV1 and FVC (liters) for both boys and girls. After adjusting for height, BMI, physical activity and wheezing in the past year, we found an inverse relationship between WC and FEV1 ($\beta = -0.015$ [95%CI -0.023; -0.008]), and FVC ($\beta = -0.010$ [95%CI -0.018; -0.001]) only for boys. For girls, the association was not significant. When we analyzed the predicted values, there was a significant association with WC (%FEV1, $\beta = -0.413$ [95%CI -0.206]; %FVC $\beta = -0.242$ [95%CI -0.464; -0.000]) only for boys.

Conclusions: Increases in WC were associated with worse lung function parameters in Brazilian boys aged 15 years old. Improvement of lung health in adolescent can prevent lung diseases in adult life.

P3964

Lung function and respiratory symptoms as predictors of mortality: The HUNT study

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Background: Impaired lung function is associated with increased mortality. However, whether respiratory symptoms, independent of lung function, are associated with all-cause or cardiovascular (CV) mortality is not clear.

Objective: To prospectively study associations of lung function and respiratory symptoms with all-cause and CV mortality in a general population.

Methods: The study included 5519 women and 4972 men who participated in the Lung study of the Norwegian HUNT study in 1995-97. Cox regression was used to calculate adjusted hazard ratios (HRs) for all-cause and CV death associated with pre-bronchodilator percent of predicted FEV₁ (ppFEV₁), grades of COPD, and respiratory symptoms (chronic bronchitis, wheeze, and dyspnoea).

Results: Lung function was inversely associated with all-cause mortality. A 10% reduction in ppFEV₁ gave a HR of 1.17 (95% confidence interval [CI] 1.09-1.25) in women and 1.23 (95% CI 1.16-1.30) in men. Compared to ppFEV₁ \geq 100, ppFEV₁ <50 was associated with a HR of 6.85 (95% CI 4.46-10.52) in women and 3.88 (95% CI 2.60-5.79) in men. Results for COPD grades corresponded to those found for ppFEV₁ levels. Of the respiratory symptoms, only dyspnoea remained associated with all-cause mortality after adjusting for lung function (HR 1.68 [95% CI 1.11-2.53] in women and 1.53 [95% CI 1.11-2.11] in men), and within levels of lung function. Overall, associations between lung function and CV mortality were weaker, and no clear relation was found for respiratory symptoms.

Conclusion: Our results suggest that pre-bronchodilator lung function is a strong predictor of all-cause mortality, and that dyspnoea is associated with all-cause mortality independent of lung function.

P3965

The effect of menopause on the lung function among Korean women; the fourth Korean National Health and Nutrition Examination Survey (KHANES IV)

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Background: Sex hormones appear to play an important role in women's lung health. But the literature on menopause and lung health is scarce, especially lung function. Some studies showed improvement or no change in forced expiratory volume in the first second (FEV1), forced volume capacity (FVC) in association with hormone therapy. And a few studies showed that postmenopausal women had significantly lower FEV1 and FVC, especially among lean women. This study examined whether menopausal status was related to the lung function.

Design & methods: Data were obtained from the 4th Korean National Health and Nutrition Examination Survey of 2007-9. A total of 1382 Women aged 44 to 61 years not receiving hormone replacement (712 premenopausal women and 670 postmenopausal women) were included in this analysis. Women who were current pregnancy, lactation, amenorrhea induced by hysterectomy were excluded. In our study, a postmenopausal woman was defined as a woman whose current age was 1 year than her age of menopause. Age, height, BMI, smoking status were adjusted by multiple linear regression analysis

Results: Postmenopausal status is not significantly associated with lower FVC (-33mL, p-value = 0.353), but associated with lower FEV1(-77mL, p-value = 0.032).

Conclusion: Postmenopausal status can be related with lower lung function in this study.

P3966

Effect of hospitalization on exercise capacity in patients with chronic obstructive pulmonary disease (COPD)

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Introduction: Exercise capacity has become an important measure to assess COPD functional status, response to medical interventions and prognosis. However, the determinants of exercise capacity change over time in COPD patients are poorly known.

Aim: To estimate the effect of hospital admissions on exercise capacity decline in COPD patients.

Measurements: 226 patients with moderate-to-severe COPD from our original PAC-COPD Study had their exercise capacity measured when clinically stable using the six minute walking distance (6MWD) both at baseline and 1.7 years after. Sociodemographic variables, lifestyle, co-morbidities, and clinical and functional status were also assessed. Hospital admissions (timelines and causes) during the follow-up were gathered from centralized government datasets. Linear regression was used to model changes in exercise capacity.

Results: At baseline, patients were mostly male (92%), aged mean (SD) 67(8) years, postbronchodilator FEV1 54(17)%, and 6MWD 444(83) m. During the follow-up period, patients decreased their exercise capacity (mean -20m/y). Moreover, 87 (39%) had at least one hospitalization (more than a half due to COPD). After adjusting for dyspnea, lung hyperinflation (RV/TLC), and baseline 6MWD, COPD admissions rate increased the 6MWD decline: -18m/y and -30m/y in ≤ 1 admission/year and > 1 admission/year, respectively, compared to patients with no admissions (p=0.001). Remaining variables were not related to the 6MWD decline, after adjusting for hospital admission.

Conclusions: These findings show that hospital admissions due to COPD exacerbation have a great impact on exercise capacity deterioration in moderate-to-severe COPD patients.

P3967

Chronic obstructive pulmonary disease surveillance: Potential usefulness of the Texas behavioral risk factor survey surveillance system

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Background: Public health surveillance of COPD has traditionally focused on risk factors and measures of disease occurrence, but these measures are insufficient to monitor effectiveness of disease control strategies.

Objectives: The purpose of this analysis was to evaluate the potential usefulness of a population-based telephone surveillance system for monitoring patient-reported outcomes among patients with COPD.

Methods: The Behavioral Risk Factor Surveillance System (BRFSS) is a statebased system of telephone surveys. In 2009, the Texas BRFSS included a question about physician-diagnosed COPD and self-rated health status. We conducted a cross-sectional analysis of self-reported COPD, fair/poor health status, and the influence of lifestyle factors, health care access, and co-morbid conditions. Adjusted prevalence ratios (PR) were calculated using multivariate logistic regression. **Results:** Adults with COPD reported significantly worse health status compared to adults without COPD (fair/poor: 49.1% vs. 13.7%, p<0.001). In multivariate analyses lifestyle and health care access factors significantly (p<0.05) associated with fair/poor health status included: current smoker (PR=2.0), physical inactivity (PR=3.0), having a personal doctor (PR=4.8), in-ability to see a doctor due to costs (PR=3.6), and pneumonia shot (PR=6.1). Co-morbid conditions significantly (p<0.05) associated with fair/poor health status were: obesity (PR=3.5), asthma (PR=1.7), cardiovascular disease (PR=3.2), and cancer (PR=1.7).

Conclusion: These results suggest that the BRFSS may be useful at the populationlevel for surveillance of COPD.

P3968

Newly developed simple QoL questionnaire in early detection of COPD in a population of smokers at risk for COPD development

population of shoker's at Fisk for COPD development Biserka Radoševic-Vidacek¹, Adrijana Košcec², Žarko Vrbica³, Ivan Gudelj⁴, Rosanda Rosandic-Piasevoli⁵, Karla Tudja⁶, Zdenka Meštrovic⁷, Davorka Martinkovic⁸, <u>Davor Plavec⁹</u>, ¹*Psychology, Institute for Medical Research a Occupational Health, Zagreb, Croatia;* ²University Centre for Croatian Studies, University of Zagreb, Croatia; ²University Centre for Croatian Studies, University of Zagreb, Croatia; ⁴Pulmology Department, University Hospital, Dubrovnik, Croatia; ⁴Pulmology Department, University Hospital Center, Split, Croatia; ⁵Clinic, Family Medicine, Split, Croatia; ⁶Clinic, Family Medicine, Donji Muc, Croatia; ⁹Research Department, Children's Hospital Srebrnjak, Zagreb, Croatia

Aim: Assessing the role of a simple newly developed QoL questionnaire (MARKOQ) in early detection of COPD in a population at risk for COPD. **Methods:** MARKOQ is a self-administered questionnaire with 18 questions. Subjects were smokers with \geq 20 pack-years, both gender, 40-65 yrs of age, with no diagnosis of COPD. They were referred to a pulmologist (history, physical, lung function) for diagnosis of COPD and the staging. MARKOQ was administered twice: at primary care clinic and 2-4 weeks later at a pulmology clinic.

Results: Sample included 219 consecutive subjects (48.5% male), mean (SD) age 52.6 (6.9) yrs with 38.0 (17.4) pack-years. 25.3% were diagnosed as COPD (stage I 18%, stage II 6.7%, stage III 0.6%). Psychometric analyses showed very good internal consistency of MARKOQ (Cronbach's alpha=0.89) and test-retest reliability (r=0.84). The correlation with CAT scores was r=0.54. MARKOQ significantly discriminated (F=4.20, p=0.013) patients with GOLD stage II or higher (mean=19.9, SD=8.7) from those in stage I (mean=12.9, SD=10.1) and "healthy" smokers (mean=12.9, SD=8.4) (CAT scores were not discriminative). Correlations of MARKOQ scores were only significant for FEV1%, (r=-0.22, p=0.003).

Conclusions: Our results indicate that the MARKOQ developed for an early detection of COPD may be able to detect early changes in QoL complementary to lung function impairment. The exact validity of the MARKOQ will be known after the reevaluation based on the cohort follow-up.

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P3969

External multicentric validation of a COPD detection questionnaire

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Introduction: Chronic obstructive pulmonary disease (COPD) is a preventable disease. The development of a simple questionnaire can help to improve the diagnosis.

Objective: External validation of the questionnaire to detect COPD in Argentina. Material and Methods: We were performed a questionnaire in subjects with over 40 years old and history of smoking ≥ 10 or more pack/year. Demographic data and pre and post bronchodilator spirometry were performed. Subjects with previous diagnosis of COPD or asthma were excluded.

Results: 468 subjects were evaluated.100 (21.1%) had spirometric diagnosis of COPD. In univariate analysis patients with COPD had higher median age (58 years vs 54 years, p <0.001), pack years (PY) smoked (40 vs 30, P <0.001), lower BMI (26 vs 28, P = 0.02), higher incidence of males (68.8% vs 43.9%, P <0.001), cough for 3 months (55.2% vs 35.8%, P = 0.001), chronic cough (47.9% vs 28.8%, P <0.001), phlegm for 3 months (50% vs 37.2, P = 0.02), chronic phlegm (40.6% vs 26.1%, P = 0.05), dyspnea (62.5% vs 51.9%, P = 0.06), wheezing (55.2% vs 47%, P = 0.15), wheezing without infection (38.5% vs 33.9%, P = 0.39), stove at home (10.4% vs 7.5%, P = 0.35) and risk profession (19.8% vs 18.5%, P = 0.78). The presence of at least 3 of these variables had a sensitivity of 95% and a specificity of 70.97%, a PPV of 50% and a NPV of 95.65%

Conclusion: This simple questionnaire for demographic and clinical data can be useful for detection of COPD.

P3970 Childho

Childhood asthma control test: Validation of the Arabic Tunisian dialect version in ${\bf 51}$ patients

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Childhood Asthma Control Test or c-ACT was translated in different languages. We propose to validate the Arabic Tunisian dialect version by checking both it's understood by patients and their parents and the conformity with the control criteria of international recommendations. Cross-sectional study was conducted in 51 asthmatic children, aged from 4 to 11 years, followed for at least 6 months. c-ACT was administrated before consultation. The level of asthma control was compared to that estimated by the expert based on GINA criteria with an evaluation period of 4 weeks. Understanding of this Arabic version has been confirmed with the patients and their parents. This version showed a satisfactory internal consistency with Cronbach's alpha equal to 0.853. The area under the ROC curve equal to 0.993 is highly significant (p <0.001). The c-ACT showed a significant discriminative ability of patients with different level of control of their asthma (p <0.001). The study of the performance of c-ACT 19 point threshold, to identify children uncontrolled, found a sensitivity of 73.7% and negative predictive value of 86.5%. Considering the 20 point threshold, sensitivity and negative predictive value reached respectively 94.7% and 96.9%. There is a highly significant correlation (p <0.001) between the level of control patients detected by the c-ACT and that estimated by the specialist with a kappa coefficient equal to 0.778. Most children have understood the Arabic version of the c-ACT. This study demonstrated a good correlation between the result of c-ACT in dialectal Arabic and clinical evaluation. the usefulness of this version will be evaluated after its release.

P3971

Shortness of breath associated with chronic conditions among those with and without asthma or COPD

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Background: Some chronic conditions may result from similar underlying mechanisms or may exacerbate lung disease suggesting the investigation of disease inter-relationships. We sought to determine if SOB was more common among adults with chronic conditions and to examine this association among those with and without asthma or COPD.

Methods: In 2010 we conducted a cross-sectional mail survey of rural households as part of the Saskatchewan Rural Health Study. One adult per home provided information about each adult living in the home. There were 8261 adults from 4624 households (42% participation) included. We examined the associations between reported diagnosed chronic conditions (diabetes, cardiovascular disease, and sleep apnea) and SOB after adjusting for potential confounders and stratifying by history of doctor-diagnosed asthma or COPD. High SOB was defined by a score of ≥ 3 on the MRC breathlessness scale.

Results: The respondents' mean age was 56 years (SD=16 years) with 51% of the population being female. Approximately 14% had a MRC score \geq 3. After adjustment, there was increased risk of high MRC score associated with the presence of diabetes [odds ratio (OR)=1.68, 95% confidence interval (CI)=1.32-2.14], cardiovascular disease (OR=2.18, 95%CI=1.80-2.65), and sleep apnea (OR=2.19, 95%CI=1.60-3.00). The associations with SOB were weaker among those with asthma or COPD with the exception of that for sleep apnea, which was stronger. **Conclusions:** Some conditions were associated with high SOB among those with and without a history of lung disease. These relationships may result from common pathways, possibly inflammatory, and may precede more serious chronic lung disease.

P3972

Detection of quality of life with COPD assessment test in chronic obstructive pulmonary disease and effect of dyspnea on disease-specific quality of life in these patients

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Background: The measurements for level of dyspnea such as Medical Research Council (MRC) dyspnea scale or modified Borg dyspnea scale were used common in the trials. COPD assessment test (CAT) is a recently introduced to use to disease-specific quality of life and follow-up of the patients with COPD.

Objective: We aimed that assessed effect of the dyspnea on disease-specific quality of life detected by CAT score in the patients with COPD. **Methods:** In this study, 90 stable patients with COPD as defined by the GOLD

methods: In this study, 90 stable patients with COPD as defined by the GOLD criteria were included. The level of dyspnea was assessed with two different scales, MRC dyspnea scale and modified Borg dyspnea scale, and disease-specific quality of life assessed with the CAT score.

Results: Patients' mean \pm SD age was 68.5 \pm 10.9 (range 41 – 97) years. A significant relationship was established among CAT score, MRC dyspnea scale, modified Borg dyspnea scale, the GOLD stage of the patients with COPD. There

was a positive correlation between dyspnea scales and the GOLD stage of the patients (p<0.001), and also positive correlation between CAT score and dyspnea scales (p<0.001). The CAT score and dyspnea scales had a significant correlation with hospitalization and emergency room applications (p < 0.05).

Conclusion: It is suggested that dyspnea is an important symptom that impact the quality of life in the patients with COPD. The CAT is simple, fast and an easy intelligible measurement for the disease-specific quality of life and it is correlated with levels of dyspnea of the patients with COPD.

P3973

Validation of quality of life questionnaire St George's for patients with respiratory diseases in Colombia, Latin America

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Background: The SGRQ a self-administered questionnaire specific for pulmonary diseases, validated in different cultures and countries. The objective of this study was to adapt one specific scale of quality of life in patients with acute and chronic pulmonary diseases in Colombia, Latin America.

Materials and methods: The Spanish version of the SGRQ was applied to 277 patients with COPD and asthma; the different components and overall scores of SGRQ were described; the forced expiratory volume in one second (FEV1), %predicted FEV1, 6-minute walk test (6MWT) and SF36 were used in the assessment battery

Results: The SGRQ showed Chronbach's alpha coefficient internal consistence was 0.94 for the overall total scale, 0.89 for symptoms, 0.93 for activity and 0.89 for impact. Correlations of coefficient inter-reliability were 0.82 and intrareliability 0.65 for the overall scores. The contents validity of the three factor structure was established; in construct validity met a slight difference between acute and chronic patients in activity with statistically and clinically significant (p<0.05). On evaluation of the concurrent validity of the SGRQ and the score of physical function (-0.67), vitality (-0.51) and social function (-0.46) of SF36 good correlations were found. The responsiveness showed statistical differences (p<0.05) with the scores being lesser in the second measurement (better quality of life)

Conclutions: SGRQ version for acute and chronic patients in Colombia is psycometrically equivalent to the original version, reliable, valid and could be used in our country and Spanish speaking countries with similar etnic, cultural and social conditions.

P3974

How accurate are assessments of exacerbations through patient self-reports?

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Background: Patient self-report is the most common method to ascertain COPD exacerbations but its accuracy is unknown. Low accuracy of measurements leads to underestimation of treatment effects.

Aims and objectives: To evaluate the accuracy of different methods to ascertain COPD exacerbations in longitudinal studies and to estimate the effect of misclassification in randomised trials.

Methods: We used event-based definition of exacerbations that required newly prescribed systemic corticosteroids and/or antibiotics. Methods to ascertain exacerbations in 411 primary care COPD patients from ICE COLD ERIC cohort over 3 years included (1) 6-months follow-ups and (2) review of patient charts by an experienced physician. These 2 methods were compared against reference standard of adjudication committee (AC) where 3-4 experienced physicians independently adjudicated exacerbations followed by AC meeting where consensus on final classifications was reached. We calculated sensitivity and specificity and reestimated the effects of long-acting bronchodilators vs. placebo on exacerbations by correcting for misclassification.

Results: 59.6% of 411 patients had at least 1 exacerbation during the 3 years according to the AC. Patient self-reports had a sensitivity and specificity of 84% and 75%, adjudication by single physicians between 88-96% and 87-99%. The pooled relative risk reduction from meta-analysis changed from 11% (95% CI 1-20%) to 35% (4-56%) when corrected for misclassification.

Conclusions: Conventional methods to assess exacerbations without central adjudication are likely to underestimate treatment effects substantially. Use of central or expert adjudication could reduce sample size requirements by up to 5-fold.

P3975

Is smoking recorded accurately on death certificates? A study of patients who died from chronic obstructive pulmonary disease (COPD) and lung cancer in a tertiary referral centre

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Introduction: Death certification provides an important source of mortality data. This data is used to monitor the health of the population and to plan health services accordingly. It is also used in research into the health effects of exposure to various risk factors. 1 Since 1992 doctors in the UK were permitted to cite smoking as a cause of death without referral to the coroner. 1 However, a recent study suggests that smoking is rarely recorded on death certificates despite smoking being attributed to 18% of all deaths in England. 2 We sought to determine whether or not smoking was being recorded accurately on death certificates in patients who died from COPD and lung cancer at one hospital.

Methods and results: Notes were reviewed for all the patients who died from COPD and lung cancer between January-November 2011 (N=183). Smoking history was recorded for 127 (69%) patients; 117 (92%) had smoked. Of these 117 patients, cause of death was certified as COPD [N=81 (69%)] and lung cancer [N=44 (38%)]. In all cases, smoking was not recorded on any part of the death certificate

Conclusions: Smoking is not recorded appropriately on death certificates in patients who died from COPD and lung cancer. This limits death certificates as a potential useful source of epidemiological data on smoking.

References:

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