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104. Respiratory epidemiology: comorbidity

P1013**Late-breaking abstract: A prospective study of central obesity, overall obesity and incident asthma in adults**

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Introduction: Measures of body mass index (BMI) and waist circumference (WC) define overall obesity and central obesity respectively. While high BMI has been established as a risk factor for asthma in adults, WC has seldom been investigated. **Aims and objectives:** We conducted a prospective cohort study to investigate the individual and combined effect of central obesity and overall obesity on adult incident asthma.

Methods: A total of 23,245 adults without asthma, 19-55 years of age from the second Norwegian Nord-Trøndelag Health Study (HUNT), were followed for 11 years. WC and BMI were measured and categorised as central obesity (WC ≥ 88 cm in women and ≥ 102 cm in men) and overall obesity (BMI ≥ 30.0 kg/m²). Incident asthma was self reported asthma during the follow up. Odds ratios (OR) were calculated by logistic regression models adjusted for age, smoking status, education, family history, physical activity, social benefit, economical difficulty and sex.

Results: Of the 23,245 adults in the analysis, 12% (n=2,792) were overall obese, 13.6% (n=3,170) were centrally obese at baseline and 3.5% (n=818) had asthma during the 11-year at follow up. Central obesity in the absence of overall obesity was significantly associated with incident asthma (OR 1.44, 95% confidence interval (CI) 1.09-1.91). The OR for overall obesity in the absence of central obesity was 1.38 (95% CI 0.96-2.00), similar to central obesity alone. Central obesity combined with overall obesity (OR 1.81, 95% CI 1.48-2.23) is compatible with an additive effect of BMI and WC on asthma.

Conclusion: Central obesity and overall obesity seem to have an individual effect on incident asthma in adults and an additive effect when in combination.

P1014**Trends in co-morbidity in oxygen-dependent COPD**

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In recent decades, mortality from non-respiratory diseases has increased in patients on long-term oxygen therapy (LTOT) for COPD (Ekström, M.P. et al. AJRCCM. Epub 2011 Jan 7). This study tests the hypothesis that co-morbidity has increased over time in oxygen-dependent COPD.

Material and methods: Patients starting LTOT for COPD between 1 January 1992 and 31 December 2008 in the national Swedish Oxygen Register were included. All registered diagnoses within five years prior to initiating LTOT were collected retrospectively from the Swedish Hospital Discharge Register, which include about 99% of all public hospitalizations in Sweden. Odds ratios (ORs) for diagnosis entities per calendar year were estimated using logistic regression adjusted for age, sex, P_aO₂ breathing air, FEV₁ and smoking history.

Results: 6147 patients (55% women) with a mean age 71.6 \pm [SD] 8.4 years were included in the analysis. Adjusted odds ratios per calendar year (OR; 95% confidence interval; P-value) increased for anaemia (1.07; 1.04-1.10; P<0.001), diabetes mellitus (1.04; 1.02-1.06; P<0.001), hypertension (1.14; 1.11-1.16; P<0.001), ischemic heart disease (1.05; 1.04-1.07; P<0.001), pulmonary embolism (1.17; 1.12-1.23; P<0.001) and for renal failure (1.20; 1.14-1.26; P<0.001). There was no time-trend for cerebrovascular disease (P=0.141) or cancer (P=0.062).

Conclusion: Co-morbidity has increased over time, which could contribute to the increased mortality from non-respiratory diseases in oxygen-dependent COPD.

P1015**Coexisting cardiovascular diseases increase the risk of exacerbations in patients with COPD**

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Background: Few studies published prediction models with exacerbation of COPD as the endpoint, and the prognostic value of coexisting cardiovascular diseases has never been evaluated adequately.

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Purpose: To develop a prediction model for exacerbation of COPD.

Methods: Data from an existing cohort of 244 patients with COPD according to the GOLD criteria were used, with a follow-up of 4.2 (SD 1.2) years. The initial assessment was between 2001 and 2003. Exacerbation of COPD was defined as a period of worsening of COPD symptoms necessitating boosts of prednisolone therapy. Univariable and multivariable logistic regression analysis was used to construct a final, reduced prediction model. After bootstrapping, c-statistics were used to estimate the ability of the model to discriminate between patients who suffered from an exacerbation and whom not.

Results: In total, 115 (47.1%) patients experienced at least one exacerbation and more than half (57.4%) of the patients had ≥ 2 exacerbations during the follow-up. The final reduced model included body mass index, FEV₁ (as%predicted), smoking history, systemic steroid use in the year before initial assessment, use of corticosteroid inhalers, a history of stroke/TIA, and a history of ischaemic heart disease. The c-statistic after bootstrapping was 0.81 (95%CI 0.76 – 0.86).

Conclusions: Variables related to severity of pulmonary obstruction, smoking history, but also a history of cardiovascular diseases were independent predictors of an exacerbation of COPD. More attention should be paid to unmask coexisting cardiovascular disease, because adequate treatment of these diseases could reduce exacerbations, but probably also mortality in patients with COPD.

P1016

Increased prevalence of elevated high-sensitivity cardiac troponin T among patients with stable chronic obstructive pulmonary disease

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Background: Previously, we have found that cardiac troponin (cTnT) elevation is frequently seen during acute exacerbations of chronic obstructive pulmonary disease (COPD) and is associated with poor survival.

Aims and objectives: To assess the prevalence of elevated high-sensitivity cTnT (hs-cTnT) in stable COPD and whether hs-cTnT is associated with pulmonary function.

Material and methods: We performed a cross-sectional case-control study. The index group consisted of 93 stable COPD patients, and the references were 113 individuals from a random sample of a general population. None of the subjects had known coronary heart disease, and the age range was 40 to 79 years in both groups. All participants underwent clinical investigation, spirometry, electrocardiography, and blood analysis including serum creatinine, NTpro-BNP, and hs-cTnT.

Results: The prevalence of hs-cTnT in the categories < 3.0 , 3.0 - 13.9 and ≥ 14.0 ng/L was significantly different between patients and controls and is shown in the table 1. Using log-transformed hs-cTnT as the dependent variable in a linear regression model adjusting for smoking, BMI, creatinine, age, gender, NT-proBNP and hypertension we found that hs-cTnT was significantly higher ($p=0.007$) among the COPD patients than in the control group. In the index group we found a significant dose-response relationship between hs-cTnT and GOLD category.

Table 1

	hs-cTnT		
	<3.0	3.0 - $13.9.0$	≥ 14.0
Controls, n (%)	55 (48.7)	57 (50.4)	1 (0.9)
Patients, n (%)	12 (12.9)	55 (59.1)	26 (28)

Chi Square = 49.3, $p < 0.0001$.

Conclusion: Stable COPD is associated with increased levels of hs-cTnT.

P1017

Predictors of high-sensitivity cardiac troponin T during acute exacerbation of chronic obstructive pulmonary disease

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Background: A high-sensitivity cardiac troponin T (hs-cTnT) concentration above the 99th percentile (i.e. 14 ng/L) is common during Acute Exacerbation of Chronic Obstructive Pulmonary Disease (AECOPD) and associated with increased mortality.

Objective: To identify factors predictive of hs-cTnT levels during AECOPD.

Methods: We included 99 patients with AECOPD on admission. As several patients had repeat admissions, there are 219 observations. We recorded clinical data, medication, spirometry, chest radiographs, ECG data and biochemical data including serum creatinine, hs-cTnT, and NT-proBNP. The data were analysed using a general linear mixed model with the natural logarithm of hs-cTnT as the dependent variable.

Results: Mean age at inclusion was 71.5 years, mean FEV₁ was 37% of predicted, and median hs-cTnT was 39.7 ng/L. The variables associated with hs-cTnT ($p < 0.15$) in univariate analysis were: Age, gender, history of smoking, coronary artery disease, heart failure and hypertension, use of ACE inhibitors, peripheral edema, blood pressure, tachycardia, PaCO₂, creatinine, neutrophil count, NT-

proBNP, and infiltrate and cephalisation on chest radiograph. In a multivariable model, patient age, history of hypertension, cephalisation, tachycardia, creatinine, neutrophil count $> 11.5 \times 10^9/L$, and NT-proBNP remained significantly associated ($p < 0.05$) with hs-cTnT.

Conclusion: Multiple variables, including those reflecting heart failure, renal dysfunction, and inflammation are predictive of hs-cTnT during AECOPD, suggesting that the mechanisms underlying hs-cTnT elevation are multifactorial.

P1018

Fibrinogen and all-cause mortality in a nationally representative US cohort

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Background: We aimed to study the association of lung function, fibrinogen and mortality.

Methods: We analyzed data from 8201 adults aged ≥ 25 years from the National Health and Nutritional Examination Survey (NHANES III). Hazard ratios were calculated to determine the risk of dying (all cause mortality) due to elevated fibrinogen values defined > 400 mg/dL (the top decile) and the interaction with lung function (determined using modified GOLD staging) and adjusted for age, sex, race-ethnicity, smoking, cardiac disease and diabetes.

Results: 3198 subjects (weighted%, 28) died during the follow-up of up to 18 years. The predictors of mortality are shown in the table (normal lung function with a fibrinogen level ≤ 400 mg/dL is the referent group for all the lung function categories).

Predictors of mortality

Factor		HR (95% CI)
Baseline Fibrinogen > 400	GOLD 3 or 4	5.4 (3.1, 9.5)
	GOLD 2	2.7 (2.0, 3.5)
	GOLD 1	1.7 (1.1, 2.5)
	Symptoms	1.7 (1.3, 2.1)
	Restricted	2.7 (1.9, 3.9)
	Normal	1.7 (1.3, 2.3)
	Baseline Fibrinogen ≤ 400	GOLD 3 or 4
	GOLD 2	1.9 (1.6, 2.3)
	GOLD 1	1.2 (1.0, 1.5)
	Symptoms	1.4 (1.2, 1.7)
	Restricted	2.0 (1.7, 2.4)
	Normal	1
Sex	Male	1.4 (1.3, 1.5)
	Female	1
Race	White	1
	Black	1.3 (1.1, 1.5)
	Mexican-American	0.9 (0.8, 1.1)
	Other	0.6 (0.5, 0.9)
	Age	
Smoking	Never	1
	Former	1.2 (1.03, 1.4)
	Current	1.9 (1.7, 2.2)
Cardiac Disease	No	1
	Yes	1.6 (1.4, 1.8)
Diabetes	No	1
	Yes	1.6 (1.4, 1.8)

Conclusion: Elevated fibrinogen values are important predictors of death and add to the predictive ability of impaired lung function to predict mortality.

P1019

COPD prevalence in chronic heart failure

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Introduction: COPD frequently coexists with chronic heart failure (CHF) leading to impaired prognosis as well as diagnostic and therapeutic challenges. However, lungfunctional data on COPD prevalence in CHF are scarce and COPD remains to be widely undiagnosed or misdiagnosed. The aim of this study was to determine COPD prevalence in CHF.

Methods: In this cross-sectional study spirometry was performed in 220 CHF patients (78.2% male, median age 71 years [IQR 63-77] with left ventricular ejection fraction $< 40\%$ recruited from the outpatient cardiology department in two hospitals in The Netherlands. COPD was determined according to GOLD criteria (post-bronchodilator FEV₁/FVC $< 70\%$).

Results: COPD was found by spirometry in 81 patients (36.8%). The majority had mild to moderate COPD (GOLD I/II 88.9%). Of these patients only 42 (51.9%) were known with a history of obstructive lung disease, whereas 39 (48.1%) had newly diagnosed COPD. By dividing the whole study population into groups of

patients with and without a history of obstructive lung disease (n = 58 and n = 162 respectively), we found overdiagnosis of COPD in the first group (n = 16, 27.6%) and underdiagnosis of COPD in the latter group (n = 39, 24.1%) based on spirometry.

Conclusion: COPD is a frequent co-morbidity in CHF with left ventricular systolic dysfunction, but is often unrecognized or even overdiagnosed. To avoid this and thus ensure adequate treatment of COPD in CHF, pulmonary function tests should be routinely obtained, preferably in a stable state of heart failure.

P1020

Acute myocardial infarction is associated with increased number of bronchial macrophages in low risk patients

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Background: Several studies have shown that low lung function (even within normal limits) as well as respiratory symptoms are associated with increased cardiovascular mortality. In a case referent study we have compared sputum from patients hospitalised for acute myocardial infarction (AMI) with sputum from a random sample in the general population. The objective was to investigate the association between inflammatory cells in the airways and AMI.

Method: The cases (N=58, mean age 58 years) had a confirmed diagnosis of AMI and performed induced sputum within 96 hours after the onset of chest pain. The referents (N=120) were selected by random sampling from the hospital's catchment area. Subjects aged 40–74 years (mean age 55 years) were invited to participate.

Results: Only six patients (10%) were females and 27 patients (47%) were current smokers. The corresponding prevalences in the reference group was 59 (49%) and 27 (23%), respectively. The total number (mean,SD) of sputum cells was $3.9 \times 10^6/\text{mL}$ (4.2) and macrophage count was $1.10 \times 10^6/\text{mL}$ (1.2) among cases, and $3.1 \times 10^6/\text{mL}$ (2.8) ($p=0.12$) and $0.72 \times 10^6/\text{mL}$ (0.69) ($p=0.011$) among referents. The difference in total macrophage count between the cases and the referents increased with declining cholesterol ($p=0.028$). There was also a negative association with increasing age, systolic blood pressure, and current smoking, although not significant.

Conclusion: AMI is associated with a high macrophage count in induced sputum from patients with a low cardiovascular risk profile, suggesting multifocal inflammatory activity.

P1021

High blood pressure, antihypertensive medication and lung function in a general adult population

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Background: Several studies showed that blood pressure and lung function are associated. Additionally, potential effect of antihypertensive medication, esp. beta-blockers, on lung function has been discussed. However, side effects of beta-blockers have been investigated mainly in patients with already reduced lung function. Thus, we aimed to determine whether hypertension and antihypertensive medication have an adverse effect on lung function in a general adult population.

Methods: Within the population-based KORA F4 study 1319 adults aged 40–65 years performed lung function tests and blood pressure measurements. Information on medical history and use of antihypertensive medication was available, too. Multivariate regression models were applied to study the association between blood pressure, antihypertensive medication and lung function.

Results: High blood pressure as well as antihypertensive medication were associated with lower FEV₁ ($p=0.02$ resp. $p=0.05$; R^2 : 0.65) and FVC ($p=0.01$ resp. $p=0.05$, R^2 : 0.73). Furthermore, a detailed analysis of antihypertensive medication pointed out that use of beta-blockers was associated with reduced lung function, whereas other antihypertensive medication had no effect on lung function. The adverse effect of beta-blockers was significant for FVC ($p=0.03$; R^2 : 0.65), while for FEV₁ the association was of borderline significance ($p=0.07$; R^2 : 0.73).

Conclusion: Our analysis indicates that both high blood pressure and antihypertensive treatment are associated with reduced lung function in a general adult population. Furthermore, we speculate that the negative effect of antihypertensive medication on lung function is mainly attributable to beta-blockers.

P1022

Prevalence of pulmonary arterial hypertension and right ventricular dysfunction in COPD patients in the Kirov region of Russia

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Purpose: To estimate the prevalence of pulmonary artery hypertension (PAH) and right ventricular (RV) dysfunction in COPD patients in the Kirov region of Russia. **Material and methods:** 1088 COPD patients (mean age 55 ± 14 years, 97% men and 3% women) were studied. All the patients underwent physical examination, laboratory investigations and transthoracic echocardiography. RV end-diastolic diameter, RV wall thickness and right atrium (RA) area were measured. The systolic pulmonary arterial pressure (PAP) was measured by pulsed Doppler (systolic PAP = tricuspid regurgitation pressure gradient + estimated RA pressure). RA pressure was estimated based on the diameter and respiratory variation of the inferior vena cava. Mean PAP was calculated with formula: mean PAP = $0.61 \times \text{PA}$ systolic pressure + 2 mm Hg. Global RV systolic function was estimated using RV myocardial performance index and RV fractional area change. RV diastolic function was assessed using transtricuspid E/A ratio and E/E' ratio.

Results: PAH (systolic PAP > 37 mmHg and mean PAP > 25 mmHg) was detected in 40.3% of cases (438 patients). Right ventricular (RV) remodeling and dysfunction were revealed in all COPD patients with PAH. Diastolic RV dysfunction was detected in 100% and systolic RV dysfunction - in 12.8% of those cases (56 patients).

Conclusions: Our study confirmed high prevalence of PAH and RV dysfunction in COPD patients in the Kirov region of Russia. Prognosis of these patients is characterized by an increased risk of death. Physicians should detect PAH in COPD patients as early as possible and start treatment for prevention complications.

P1023

Prevalence of comorbidities in patients with COPD in south-Spain

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Objective: The prevalence of comorbidities in COPD is variable according to different publications. Our objective was to analyze the prevalence of comorbidities in stable COPD patients in our area, and its relation to other parameters.

Material and methods: Concurrent multicenter prospective study that included stable COPD patients from 6 hospitals at the South of Spain. We obtained demographic, epidemiologic and pulmonary function test variables, Charlson and BODE index, British Medical Research Council (BMRC) Dyspnea scale, London Chest Activity of Daily Living Scale (LCADL), Hospital anxiety and depression scale (HAD) and St George's respiratory questionnaire (SGRQ).

Results: We studied 164 patients (83.5% males), with a mean age of 65.7 years and mean FEV₁ of 49.7%. According to GOLD classification, 4.9% were in Stage I, 38.4% in Stage II, 45.1% in Stage III and 11.6% in Stage IV. The prevalence of ischemic cardiopathy was 9.8%, heart failure 6.1%, peripheral vascular disease 8.5%, ischemic stroke 4.9%, ulcer disease 7.9%, diabetes 12.8%, neoplasms 11%, hepatic disease 10.4% and renal disease 2.4%. Using the HAD scale 14% of the patients showed anxiety symptoms, and 15.2% depression symptoms. 30% of patients have 1 comorbidity, 16.6% have 2 comorbidities and 3.7% have 3 or more. The prevalence of comorbidities didn't correlate with the severity of COPD. There was statistical correlation between Charlson index and hospital admissions due to COPD exacerbation.

Conclusions: The prevalence of comorbidities in our patients with COPD was high compare with general population, and independent of the degree of severity. Charlson index correlated with hospitalizations due to COPD exacerbations. Funded by Neumosur.

P1024

The evaluation of systemic inflammation in COPD patients comorbid with cardiovascular diseases or diabetes mellitus

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Background: COPD is one of so-called life-style related diseases and reported to show systemic inflammation, due to strong relationship to long-time tobacco smoking. Therefore, COPD patients often have a variety of comorbid diseases, in-

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cluding cardiovascular diseases (CVD), diabetes mellitus (DM), and other systemic diseases.

Purpose: To investigate smoking status and frequency of comorbid COPD among the patients with CVD, DM, or both, who had smoking history (>10 pack \times years), and also to investigate how CVD, DM or COPD is associated with systemic inflammation, oxidative stress and clinical disorders.

Method: Totally 83 patients, over 40 years with history of cigarette smoking, were recruited for this study. All the participants were examined for pulmonary function test with bronchodilator, urine 8-OHDG/Creatinine, plasma levels for TNF- α , hs-CRP and pentosidine as predictors of airway obstruction, oxidative stress and systemic inflammation.

Results: 11 in the 21 patients with CVD (52.4%) were diagnosed as COPD, 14 in 37 with DM (37.8%), and 9 in 25 with both (36.0%). Further analyses on the associations between each disease and systemic inflammation or oxidative stress were performed by logistic multivariate analyses adjusted with age, sex, smoking history, statin use, and each disease. As the results, Systemic inflammation evaluated by hsCRP increased significantly with statin use. The risk of oxidative stress evaluated by 8-OHDG increased approximately 3 fold with COPD.

Conclusions: Because the smokers with DM or CVD seem to have much higher risk of COPD than smokers without them, they should be examined with pulmonary function test.

P1025

Use of a US population-based survey to describe the relationship of COPD and co-morbidities

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The Behavioral Risk Factor Surveillance System (BRFSS) is a US state-based survey that includes 90+ questions on health issues primarily related to chronic diseases. In 2007 and 2009, 6 questions were added to the North Carolina (NC) BRFSS to describe the prevalence and impact of COPD. In the 2009 NC BRFSS, there were 12,337 adults who completed the survey and 993 reported they had been diagnosed with COPD. The age-adjusted prevalence of COPD was $> 5\%$. The age-adjusted relative risk (RR, 95% CI) for 7 chronic diseases were compared between COPD and non-COPD: arthritis (1.64, 1.46-1.84); diabetes mellitus (1.76, 1.39-2.24); myocardial infarction (2.58, 2.0-3.33); coronary artery disease (CAD) (3.49, 2.5-4.9); stroke (2.04, 1.53-2.74); kidney disease (2.85, 1.89-4.3); current asthma (7.5, 6.24-9.0); 3+ of these co-morbidities (4.95, 3.93-6.3). About 1 in 5 persons with COPD had 3 or more of these co-morbidities compared to 1 in 40 persons without COPD. One of the 6 BRFSS questions in 2009 addressed the use of prednisone in the prior year in persons with COPD. The RR of prednisone use in COPD patients with any of the co-morbidities were: arthritis 1.15 (0.89-1.48); diabetes mellitus 0.73 (0.47-1.11); myocardial infarction 1.0 (0.6-1.68); CAD 1.86 (1.02-3.38); stroke 1.28 (0.67-2.43); kidney disease 1.77 (0.77-4.07); current asthma 1.48 (1.08-2.03); 3+ of these co-morbidities 1.44 (0.95-2.2). Increased prednisone use in concurrent asthma and COPD is expected whereas increased likelihood of receiving prednisone in patients with concurrent COPD and CAD is an unexpected finding, possibly related to severity of disease in these patients.

P1026

Prevalence of anemia of chronic disease in patients with chronic obstructive pulmonary disease

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Background: Anemia of chronic disease (ACD) is a disorder occurring in subjects with chronic immune activation. Chronic Obstructive Pulmonary Disease is characterized by systemic inflammation, so it could be accompanied by ACD.

Aim: To determine the prevalence of ACD among stable COPD patients.

Methods: The initial study population consisted of consecutive clinically stable patients with COPD (post bronchodilation FEV₁/FVC <0.7 ; no exacerbation, hospitalization or change in medication in the previous 3 months), who visited three outpatient respiratory clinics. Those with asthma history, heart failure, renal failure, malignancies, systemic or autoimmune disorders, chronic infections, blood loss of any kind and hemoglobin (Hb), liver or thyroid disorders were excluded. In the rest, ACD was confirmed by the presence of: a) low Hb (<13 mg male; <12 mg female), b) ferritin >30 ng/ml, c) total binding iron capacity <250 mg/dl, and d) transferrin saturation 15-50%

Results: The prevalence of ACD was 10.24% and it was mild (Hb level=12.1 \pm 0.7 g/dl). The ACD patients, compared to the non-anemic ones, were more often males (93.1% vs 77.2%; $p<0.001$), were older (64.6 \pm 8.3 vs 60.3 \pm 5.5 years;

$p<0.05$), had lower FEV₁%predicted (42.3 \pm 9.8 vs 50.7 \pm 6.1; $p<0.05$) and more severe disease according to GOLD classification (stage II: 24.1% vs 29.9%; stage III: 44.8% vs 46.6% and stage IV: 31% vs 23.2%; $p<0.05$). Smoking history, gas values and weight did not differ, although ACD patients had lower weight when compared to non-anemic ones, matched for age, sex, height and FEV₁% predicted.

Conclusions: ACD could be another systemic manifestation of COPD, since its prevalence was approximately 10% among stable patients.

P1027

The association between asthma, atopic diseases and metabolic factors in a young population of southern Taiwan

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Background: Previous studies have suggested that obesity and cholesterol may play a role in the susceptibility for asthma. The relationship between cholesterol concentrations, asthma and atopic diseases is still controversial.

Objective: The aim of this study was to investigate whether metabolic factors are associated with asthma and atopic diseases.

Methods: The cross-sectional study sampled randomly 6838 subjects ≤ 18 years old from elementary, junior and senior high schools in southern Taiwan. All subjects completed questionnaire interview, weight and height data measurements and blood sample collection. Allergic disorders were determined by the subjects ever been diagnosed by a doctor. Body mass index (BMI), blood pressures, the levels of triglyceride and total cholesterol were measured.

Results: We found a significant association between high concentrations of cholesterol and dermatitis in girls (aOR = 1.56, $p = 0.002$) and rhinitis in boys (aOR = 1.31, $p = 0.038$) after adjusting for potential confounding factors. Obesity was statistically significant associated with dermatitis ($p = 0.008$) and rhinitis ($p = 0.038$). The interaction effect of cholesterol and obesity on dermatitis was significant ($p = 0.032$). We did not find that cholesterol and triglyceride concentrations were associated with asthma.

Conclusion: We found that high concentrations of cholesterol were associated with dermatitis in girls and rhinitis in boys. Obesity and high concentrations of cholesterol may increase the risk of dermatitis.

P1028

Epidemiology of allergic rhinitis in asthmatic patients in Greece

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Background: The co-morbidity of allergic rhinitis and asthma is a fundamental issue of common airway disease.

Aim: This study was designed in order to evaluate the co-existence of allergic rhinitis in asthma patients in Greece.

Methods: Data from 2700 patients with diagnosed asthma and nasal symptoms were recorded during a scheduled or an urgent visit to a specialized physician. The study was performed by respiratory physicians and allergiologists. Recordings were based to a common study questionnaire.

Study population: A total of 2588 asthma patients were finally evaluated. The mean age was 43.7 years with a small prevalence of female gender. One third of asthmatic patients were smokers.

Results: 62% of asthmatic patients were atopic and 53% of them had a positive asthma family history. 80.7% of asthmatic patients also had symptoms from allergic rhinitis. Nasal symptoms showed significant seasonal distribution with major peaks in spring (70%) and autumn (32%). In 60% of the cases the allergic rhinitis symptoms affect daily activities and in 72% they deteriorate asthma symptoms.

Despite the use of appropriate treatment, asthma was not well controlled in 40% of the cases. 60% of the patients had at least one asthma exacerbation in the previous year and among them 85% had 1-3 exacerbations. In addition in well controlled asthmatics who were the 40.3% of total population, 77% of the patients have used medical therapy for managing allergic rhinitis.

Conclusion: The co-morbidity of allergic rhinitis in asthmatic Greek patients is high and needs to be always addressed and managed properly in order to achieve a better asthma control.

P1029

Asthma and obesity: Epidemiological data in young adults

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In recent years, several studies have found an increase in the prevalence of asthma among obese patients, but the exact nature of this association has not been fully elucidated. The aim of this study was to assess the association between asthma and obesity in 23- to 25-year-old Brazilian adults.

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This was a cross-sectional analysis of 1922 men and women. Subjects completed a translated questionnaire from the European Community Respiratory Health Survey and underwent spirometry and a bronchial challenge test. Weight, height and waist circumference were measured. Multiple logistic regression analysis was carried out to assess the association of variables related to obesity and asthma, defined by the presence of symptoms and bronchial hyperresponsiveness (BHR). A self-report of a previous physician diagnosis of asthma was separately analyzed as also were socioeconomic characteristics, schooling, physical activity, smoking status, anthropometry and spirometry.

No association was detected between asthma confirmed by BHR and obesity indicators: odds ratio (OR)= 1.076 (95% CI: 0.689 - 1.680) for obesity assessed by body mass index ≥ 30 kg/m²; OR = 0.947 (95% CI: 0.686-1.308) by abnormal waist circumference and OR = 1.019 (95% CI: 0.740-1.404) by waist-to-height ratio ≥ 0.5 . A previous diagnosis of asthma revealed association with obesity: OR = 1.480 (95% CI: 1.014-2.161) for obesity assessed by body mass index ≥ 30 kg/m²; OR = 1.413 (95% CI: 1.084-1.841) by abnormal waist circumference and OR = 1.477 (95% CI: 1.133-1.926) by waist-to-height ratio ≥ 0.5 .

Our findings did not support a connection between asthma confirmed by BHR and obesity, but obesity was associated with self-report of a previous physician diagnosis of asthma.

P1030

Effects of psychiatric comorbidity on respiratory drugs and health care utilization

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Background: Psychiatric disorders are significant comorbid conditions in chronic obstructive pulmonary disease (COPD), however their effects on respiratory health care costs are still debated.

Aim: To investigate the relationship between psychiatric comorbidity and respiratory health care costs in an epidemiological survey.

Methods: 1354 subjects (mean age: 58.0yrs \pm 18.0; 45.3% males) living in Pisa (Central Italy) participated in a cross-sectional study (2009-11) within the IMCA2 (Indicators for Monitoring COPD and Asthma in the EU) project. An interviewer administered questionnaire on socio-demographic characteristics, respiratory symptoms/diseases, cardiovascular diseases (CVD), risk factors and the Hospital Anxiety and Depression Scale were used.

Logistic regression analyses, adjusted for smoking habits, age, sex, CVD, were used to evaluate association between respiratory drug, health care utilization and asthma/COPD with (AC+AD) or without anxiety/depression (AC); anxiety/depression without asthma/COPD (AD); neither anxiety/depression nor asthma/COPD (NN).

Results: Respiratory medicines use was 27.5% in AC+AD, 22.4% in AC, 1.7% in AD and 2.5% in NN. Respiratory health care use was 50.5% in AC+AD, 36.8% in AC, 11.6% in AD and 5.8% in NN.

Respiratory drugs and health care utilization were associated with AC (OR=12.0, 95%CI=6.8-21.1; OR=8.4, 95%CI=5.6-12.6, respectively) and AC+AD (OR=14.5, 95%CI=7.2-29.0; OR=15.6, 95%CI=9.0-26.9, respectively). Health care utilization was also associated with AD (OR=2.1, 95%CI=1.1-3.9).

Conclusions: Psychiatric comorbidity in subjects affected by asthma or COPD increases the impact of respiratory disease in terms of respiratory drugs and health care utilization.