75. COPD: comorbidities

E500

Evaluation of metabolic syndrome and carotid intima media thickness in COPD

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Introduction and Background: Metabolic syndrome frequency has been reported to be increased in COPD.Intima media thickness (IMT) increases in both coronary and peripheral arteries at early stages of atherosclerosis.
Aims and objectives: We aimed to investigate the frequency of metabolic syndrome and carotid IMT in COPD patients which may contribute to the evaluation cardiovascular risks.
Methods: Fifty-one stable COPD patients admitted to our clinic were included. Blood pressure, pulse, weight, height and waist circumference were measured. Fasting blood glucose, triglyceride, high density lipoprotein levels were analyzed in the venous blood samples obtained at the same day.Metabolic syndrome defined as abdominal obesity, atherogenic dyslipidemia, increased blood pressure, insulin resistance was evaluated.Afterwards, bilateral carotid doppler ultrasonography was performed.A focal IMT≥1 mm was defined as increased IMT.
Results: Mean age of 51 patients was 64±18.Eight percentages of the patients were stage 1, 33% were stage 2, 43% were stage 3, 16% were stage 4 according to GOLD. Mean FEV1% was 48±21 and mean IMT was 1,11±0,24 micrometer. Metabolic syndrome was determined in 43% of the patients. Metabolic syndrome prevalence was correlated with COPD stage and FEV1% (p=0.009,r=0,365;p=0,031,r=-0,303,respectively), however it was not found to be related with disease duration and smoking history.Carotid IMT did not show any relationship between disease duration, stage and FEV1. It was also not correlated with metabolic syndrome.
Conclusion: Our results demonstrated increased frequency of metabolic syndrome in COPD patients as well as carotid IMT; an early marker atherosclerosis was over the upper limit of normal.

E501

Exercise tolerance and its relation to vascular dysfunction in smoking elderly

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Background: The relation between daily physical activity (PA) and exercise tolerance (VO_{2max}) and its link with vascular dysfunction is not studied in smokers. The aim of this study is to investigate these associations and potential covariates in smoking elderly.
Methods: Eighty (ex-) smokers (40 with COPD) were recruited. PA (SenseWear Armband) was assessed. Maximal cycle ergometry (VO_{2max}) was performed and quadriceps force (QF) determined. Ankle brachialis index (ABI) and mean intima media thickness (IMT) of the right carotid artery were used as indices of vascular function. Multiple stepwise regression was used to investigate determinants of VO_{2max}. Partial correlations between VO_{2max} and vascular function were calculated correcting for age, sex, weight and pack years.
Results: Group characteristics are given in table 1.

Table 1. Group characteristics

	COPD	No COPD	P
Age (y)	65±6	63±4	–
Packyears	49±24	41±23	0.12
FEV1 (%pred)	88±12	102±14	*
FEV1/FVC (%)	62±8	76±4	*
Steps (per day)	7498±3449	8375±2723	0.24
Moderate intense PA, active time > 3 METs (min/day)	84±69	104±63	0.16
QF (%pred)	95±15	91±14	0.51
VO2max (ml/min/kg)	26±4	28±7	0.13
IMT (mm)	0.73±0.8	0.67±0.14	0.16
ABI	1.1±0.11	1.13±0.12	0.15

Means ± std; *p<0.05 vs COPD.

VO_{2max} was determined by moderate intense PA (R^2=0.11), age (R^2=0.05), sex (R^2=0.05), FEV1 (R^2=0.05) and QF (R^2=0.04; total R^2=0.30). Partial correlation between VO_{2max} and both ABI and IMT were 0.29 (P=0.01) and -0.28 (p=0.02), respectively.
Conclusion: Moderate intense PA is a predictor of exercise tolerance in smokers and mild COPD. Exercise intolerance is associated to vascular dysfunction in these patients.

E502

Clinical differences of COPD patients with and without metabolic syndrome

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Introduction: COPD is associated with cardiovascular disease. Metabolic syndrome (MS) increases the risk of developing cardiovascular disease and diabetes.
Objective: To determine the prevalence of MS in patients hospitalized for an acute exacerbation of COPD, and the factors related with MS in this population.
Subjects and methods: ECCO is an observational, prospective, multicentre study. It included those patients admitted with a COPD exacerbation to any of the participating Internal Medicine departments consecutively between January 1, and September 30, 2007. They were all COPD spirometry-confirmed GOLD 2 or higher in stable condition. MS was defined as presence of any 3 of the 5 following criteria: obesity (BMI >30 kg/m^2), elevated triglycerides (≥150 mg/dL), reduced HDL (<40 mg/dL in males or <50 mg/dL in females), high blood pressure (systolic ≥130 or diastolic ≥85 mm Hg), elevated fasting glucose (≥100 mg/dL).
Results: 375 patients, 333 men and 42 women, with a mean (SD) age of 73.7 (8.9) years were included. Overall, 161 (42.9%) had MS. MS was more frequent in women (59.5% vs 40.8%; p=0.02). Women had a greater number of diagnostic criteria for MS [2.25 (1.10) vs 2.74 (0.96); p=0.006], and had more frequently diabetes (92.9% vs 78.1%; p=0.02). COPD patients with MS had greater percent predicted FEV_1 [45.5 (12.1) vs 41.8 (12.4); p=0.004], and lesser severity of COPD as per GOLD (p=0.0009). However, those COPD with MS patients had more severe mMRC dyspnea (p=0.03), and more cardiac comorbidity (p<0.05) than those without MS.
Conclusion: Metabolic syndrome is frequently observed in COPD patients, and it is associated with milder severity of COPD but more morbidity and use of health services.

E503

Metabolic syndrome is associated with increased risk of acute exacerbation of COPD: A preliminary study

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Background: Studies have confirmed correlation between Metabolic Syndrome (MetS) and Chronic Obstructive Pulmonary Disease (COPD). To date, no studies have showed a link between exacerbations of COPD (ECOPD) and MetS.
Aim: The aim of our study was to examine, if presence of MetS increases frequency and duration of ECOPD.
Material & Methods: COPD patients were prospectively enrolled, randomized into two groups, with and without MetS and followed for 12 months. Medi-

cal records, pulmonary function tests, chest X-rays; laboratory test results and information on frequency and duration of ECOPD were gathered.
Results: A total of 106 patients were recruited, 29 with MetS and 77 without. The mean exacerbation of COPD frequency was 2.4±0.8 in MetS group versus 0.68±0.6 in the control group ($P < 0.0001$). Mean duration of each exacerbation was 7.5±1.5 days in patients with MetS versus 5±2.4 days in patients without. Serum C-reactive protein, fasting blood glucose and triglycerides were positively and significantly correlated with exacerbation frequency ($p<0.05$).
Conclusion: Present study demonstrates an association between frequency of ECOPD and its duration with the MetS. The systemic inflammation induced by common cytokines may explain the linkage between the two conditions.

E504
Obesity and COPD
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Introduction: Nutritional abnormalities are one of the most important systemic effects of chronic obstructive pulmonary disease (COPD). A relationship between COPD and obesity is increasingly recognised.Besides the changes of the total body weight, it is well recognised alterations in body composition in COPD patients, with selective wasting of fat-free mass (FFM).
Objective: This study was undertaken to evaluate the impact of obesity and body composition on the pulmonary function, dyspnoea level and quality of life in COPD patients.
Method: 79 patients in the stable state of COPD were evaluated.Pulmonary function and arterial blood gas analysis were assessed. Nutritional status was analyzed according to body mass index (BMI). Body composition was evaluated using anthropometric measurement by fat free mass index (FFMI). Quality of life was assessed using the St. George Respiratory Questionnaire (SGRQ).The Visual Analoge Scale (VAS) was used to evaluate dyspnoea.
Results: The highest frequency of obesity (50%) we found in GOLD stage I, while the lowest prevalence was in GOLD stage IV (10%). Selective wasting of FFM occurs in 22.2% normal weight and in 9% overweight COPD patients. The quality of life was lower in obese compared with other COPD patients. The highest dyspnoea level was in obese patients, as well. We found significant positive correlation between forced expiratory volume at 1 s (FEV_1%) and BMI (r=0.326, p=0.003), FEV_1% and FFMI (r=0.321, p=0.004).
Conclusion: The highest prevalence of obesity was in patients with mild COPD. Obesity in COPD was associated with less severe airflow obstruction. Obese patients with COPD had higher dyspnoea level and lower quality of life.

E505
Circulating obestatin in chronic obstructive pulmonary disease
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Background: Disorder of nutritional status and system inflammation are common phenomena in chronic obstructive pulmonary disease (COPD) and their mechanisms remain unclear now. Some peptides, such as obestatin, regulating human metabolism balance, are thought to play important roles in nutrition disorder and system inflammation in COPD.
Objectives: This study was aimed to investigate the circulating obestatin level in COPD and its relationship with the nutrition status and system inflammation.
Methods: Circulating obestatin in 62 COPD patients and 22 age matched normal controls was assayed with enzyme-linked immunosorbent assay. COPD patients were divided into three group based on body mass index (BMI): normal weight (BMI between 20 and 26, n=21), COPD with overweight (BMI more than 26, n=15) and COPD with underweight (BMI less than 20, n=26). Pulmonary function, nutrition status and inflammation marker were also measured.
Results: Circulating obestatin was higher in COPD than that in normal control (5229.70±3622.74 ng/ml in COPD, 3030.50±1702.46 ng/ml in normal control, p=0.008). As to the circulating obestatin in the three COPD groups, there was no difference among COPD patients with normal weight, overweight and underweight ($p>0.05$). Significant positive correlation was found between circulating C reaction protein (CRP) and obestatin (r=0.241, p=0.027). There was no significant correlation between circulating obestatin and BMI, pulmonary function or COPD history ($p>0.05$).
Conclusion: Circulating obestatin increased in COPD and this increased obestatin was positively correlated to system inflammation, but not to COPD nutrition status. Circulating obestatin may be a new inflammation marker in this disease.

E506
Metabolic syndrome and COPD
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Background: The metabolic syndrome (MS) is an insulin-resistant state combined with a high cardiovascular risk, abdominal obesity, arterial hypertension, and atherogenic dyslipidemia. It is already known that COPD and MS have common pathogenic pathways.
Aim: To study the prevalence of MS among COPD patients.
Material: We studied 3598 patients with COPD: men – 2637 (73.3%), women – 961 (26.7%). The MS was defined by three different criteria (WHO): Diabetes mellitus type 2 (DM) plus 2 additional factors: obesity with body mass index (BMI) > 30kg/m^2 and arterial blood pressure ≥140/90mmHg. Parameters such as age, sex, BMI, pulmonary function test, tobacco smoking, accompanying the cardiovascular diseases, C-reactive protein (CRP), α1-antitrypsin, were also measured.
Results: 13.8% (497) of all patients with COPD had MS, 12.8% of men and 16.4% of women (p=0.006). The patients with MS had mean age of 65.7±9.0 years; FEV1 = 48.5±18.08% pred. (GOLD I – 8.2%, GOLD II – 31.6%, GOLD III – 30.2%, GOLD IV – 30%); BMI = 33.84±3,1; packs/years = 45,5±25,5. The COPD patients with MS had a higher cardiovascular disease rate than those without MS: coronary artery disease (CAD) – 82.7%/59.9% (p=0.0001); heart failure (HF) – 83.1%/68% (p=0.0001); cor pulmonale (CPH) – 45.3%/40.1% (p=0.03); arterial hypertension (AH) – 100%/41.1% (p=0.0001) end cerebrovascular diseases (CVD) – 33.4%/29.5% (p=0.08). The levels of serum CRP and α-1-antitripsin in COPD patients with MS were: 23±12.5 mg/L / 193±41.4 mg/dl, and in those without MS: 8.1±10.9 mg/L / 154,7±42,7 mg/dl (p=0.0001).
Conclusion: MS is highly prevalent in COPD patients, especially in women. MS is accompanied by a statistically significant higher cardio-vascular pathology.

E507
Carbohydrate metabolism state in COPD patients
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Aim: To study carbohydrate metabolism state in COPD patients by glucose tolerant test (GTT).
Methods: 33 COPD patients within the age of 42 to 60 (mean 53.4), including 25 patients without obesity and 8 patients with obesity were studied using GTT. Control was on the basis of meta-analysis of 14 researches, reflected in the scientific works for the period of 1996-2010 concerning impairment glucose tolerance (IGT) spread according to GTT in general population and in obese patients in Europe.
For this purpose 7 cases were chosen which were most compatible with each other and with our group of patients by different signs. GTT results were used as controls. In our work GTT was performed in 25 patients with chronic bronchitis within the age limit of 40-60 (mean age 53.5).
Results: IGT spread in COPD patients without obesity was found to be 2 times above control values, significantly exceeding the values obtained in the first and second controls ($p<0.001$ and $p<0.05$, respectively). In most patients (57%) IGT occurred at normal fasting glucose levels. IGT spread in obese COPD patients was also above control values (1.6 times) but in was insignificant, which was probably the results of a small number of patients (at extrapolation for 50 persons differences became significant, $p<0.05$). GTT allowed also to reveal diabetes mellitus of 2 type in both groups (4% and 25%, respectively) in patients in whom glucose fasting levels were normal.
Conclusion: In COPD patients carbohydrate metabolism disturbances are significantly more common than in control, the fact showing that COPD increases the risk of their development and COPD patients may are among the risk group.

E508
Metabolic syndrome in patients with stable COPD
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Introduction: Chronic obstructive pulmonary disease (COPD) has extrapulmonary effects that may be related with systemic inflammation. The relationship between metabolic syndrome and COPD is still unknown.
Aim: The aim of this study was to investigate frequency of metabolic syndrome (MS) and C-reactive protein (CRP) levels in stable COPD patients.
Method: Fifty-five patients were included.The severity of COPD was determined by Global Initiative for Chronic Obstructive Lung Disease (GOLD). Adult Treatment Panel III report (ATP III) criteria were used in MS diagnosis.
Results: 30 of 55 patients (54.5%) had MS. The frequencies of MS according to GOLD stage from I to III were found respectively 44.4%, 62.9%, 36.4%.
CRP levels higher than normal (>5mg/l) in %38.2 of patients. This ratio was highest in patients with GOLD stage II (48,6%).
Ratio of high CRP levels in MS group was more than patients without MS (46.7% vs 28%).
Conclusion: The frequency of MS in stable COPD patients was found higher than general Turkish population (54.5% vs 33.9%). CRP levels were higher in MS

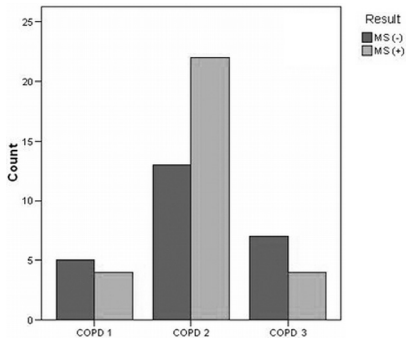

Figure 1

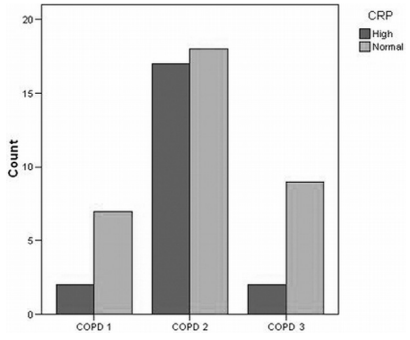

Figure 2

group supporting presence of sytemic inflammation So, COPD patients should be carefully evaluated by means of MS presence.

E509

Aging and COPD affect different domains of nutritional status – The ECCE study

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Background: Malnutrition is an extrapulmonary manifestation of COPD and its prevalence increases with age.
Aim: We aimed at exploring whether COPD and aging determine malnutrition in different manners.
Methods: Stable outpatients with COPD (n=460; M/F: 376/84) from the Extrapulmonary Consequences of COPD in the Elderly (ECCE) study database were investigated: mean age 75.0 (5.9) years, mean FEV1%pred 54.7 (18.3)%. Nutritional status was evaluated by body mass index (BMI) and Mini Nutritional Assessment (MNA) questionnaire. From the MNA, three scores exploring the domains of the nutritional status were calculated: body composition, energy intake and body functionality scores.
Results: GOLD stages were negatively correlated with five MNA items exploring mobility, patient's perception of own nutrition and health status, arm and calf circumferences (lowest rs=-0.013; highest p=0.039). In terms of scores, GOLD stages were independently correlated with body composition and body functionality scores (model R2=0.075). On the contrary, age was negatively correlated with four MNA items exploring loss of appetite, digestive problems, chewing or swallowing difficulties, fluids intake, mobility and autonomy in daily life (lowest rs=-0.013; highest p=0.030). In terms of scores, age was independently correlated with body functionality score (model R2=0.037).
Discussion: COPD severity influences body composition, and body functionality, whereas aging mainly decreases body functionality. This implies that correction of the energy intake could be marginal in COPD management, whereas prevention and treatment of body functionality deterioration could be important components of nutritional care.

E510

COPD: Influence of nutritive status on quality of life (QoL) and dyspnoea level

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Aim of study: To evaluate influence of body mass index (BMI) on QoL and dispnoea level in patients with stable COPD.
Study population and methods: 43 patients with stable COPD (Stage III) were allocated into three groups in accordance with their nutritive status: Group I – 15 patients with BMI <18.5, Group II – 15 patients with 18.5<BMI<25, Group III – 13 patients with BMI>25. For the evaluation of the QoL St. George Respiratory questionnaire (SGRQ) were performed. Dyspnoea was measured by MMRC score in all patients.
Results: All groups were similar regarding to sex, age, PFT parameters and actual medication. The data of PFT, SGRQ and dyspnoea level are performed in the table1.

Groups	SGRQ total (M±m, Scores)	Dyspnoea (M±m, Scores)	FEV1 (M±m % of predicted)
Group I	67.9±3.5	3.9±0.7	50.6±5.3
Group II	48.6±2.1	2.1±0.2	49.9±6.6
Group III	55.2±3.7	3.3±0.4	53.7±4.8

The most significant impairment in QoL was found in group of malnourished patients. Dyspneoea in patient's with normal BMI was significantly lower against respective values in both malnourished and overweight groups ($p<0.05$). Patients of group I demonstrate higher dyspnoea level than in group III, but this difference was not statistically significant.
Conclusions: 1. Malnutrition most significant decrease QoL in COPD patients independently of their pulmonary function.
2. Both malnutrishion and overweight increase the dyspnoea level in patients with COPD.

E511

COPD: Different psychology status (PS) in the patients with different fat free body mass (FFBM)

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Aim: To evaluate whether and in which extent FFBM have influence on the PS in patients with COPD.
Study population: 30 men with COPD, stage III and 15 healthy men made the study sample: Group I – 15 COPD patients with FFBM <16.0, Group II – 15 patients with FFBM≥16.0. Control group (Group III) consist of 15 healthy men with FFBM≥16.0. Exclusion criteria were 1) mental diseases; 2) presence of either cardiovascular or other respiratory diseases or acute infections.
Methods: For the evaluation of the PS the depression (by Y.Zung scale), the anxiety (by Ch.D. Spilberger questionnaire) and the vegetative lability (by VELA test) were studied in all patients. FFBM by means of bioelectrical impedance analysis were performed for all patients.
Results: All groups were similar regarding to sex, age and smoking status. One or more abnormalities in PS were found in 14 (93.33%) patients of Group I, in 11 (73.33%) – of Group II and 2 (13.33%) persons in Group III. The data of psychological tests are performed in the table 1.

Groups	Depression (M±m)	Personal anxiety (M±m)	Situational anxiety (M±m)	Vegetative lability (M±m)
I	69.3±2.5	34.6±1.8	23.4±0.3	38.3±1.5
II	40.3±2.1	38.2±1.5	21.7±0.6	20.5±1.0
III	28.1±1.1	22.2±1.7	20.0±1.7	11.3±0.8

Conclusions: 1. Most of patients with COPD have impaired PS in comparison with healthy people, and the most significant changes concerns depression, personal anxiety and vegetative lability level.
2. FFBM loss associate with increasing of depression and vegetative lability in patients with COPD.

E512

Clinical impact of anemia in patients with COPD

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Background: Recent studies prove that anemia in patients with COPD is highly prevalent and associated with increased mortality. Anemia is such a common and simple clinical finding that its real physiologic relevance in COPD can be frequently underestimated.
The aim of this study was to determine the prevalence of anemia in patients with COPD and to
evaluate the associations between hemoglobin levels and some clinical outcomes.
Methods: 158 consecutive patients with COPD were recruited into the study. Spirometry, hemoglobin levels, dyspnoea by MRC scale, exercise capacity by 6MWD test, the BODE were evaluated. Comorbidities were assessed by Charlson Comorbidity Index (CCI).
Results: All patients were distributed according to the age in 2 groups: 80 elderly patients, mean age 72.2±4.8 years and 78 younger patients, mean age 56.8±3.9 years. Patients had the similar degree of bronchial obstruction, measured by FEV1,%: 42.3±12.8% versus 42.7±14.4% ($p>0.05$). Anemia was present in 25 (31%) elderly and in 22 (28%) young patients. Older patients with anemia had

more comorbidities and higher BODE than nonanemic persons (CCI 3.16±1.18 versus 2.76±1.37, p<0.05 and BODE 7.3±1.5 versus 6.8±1.84, p<0,05). Mean MRC values were significantly higher (4.04±0.74 versus 3.73±0.59, p<0.05) and mean 6MWD was significantly shorter (181±69 m versus 221±85 m, p<0.05) in anemic in comparison with nonanemic elderly patients. The forward stepwise regression analysis shows that the level of Hb is an important predictor of dyspnoea and an exercise capacity in elderly COPD patients which explains 21% of the MRC scale and 17% of the exercise capacity.
Conclusion: Anemia in COPD is an independent risk factor for worsening of dyspnoea and reducing functional capacity.

E513
Anemia and mortality in COPD patients
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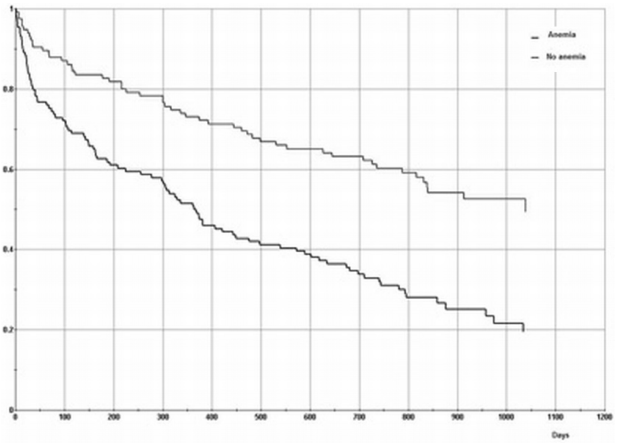
Objective: To determine the prevalence of anemia in COPD patients admitted to an Internal medicine department and the mortality related with anemia in this population.
Subjects and methods: All patients with COPD discharged from an Internal Medicine department with a main or secondary diagnose of COPD between January 1, and December 31, 2007 were included. At admission, age, gender, clinical information (atrial fibrillation, heart failure) and biological parameters (haemoglobin and creatinine) were collected.
Results: 251 patients, 183 men and 68 women, with a mean (SD) age of 77.9 (9.4) years were included. Median of follow up was 531 days (1-1115). Overall, 135 (53.8%, 95% CI 47.6-59.59) had anemia. Patients with anemia were older [79.5 (8.9) vs 76.3 (9.78) years; p=0.007]. There was no association with gender, atrial fibrillation, heart failure or eGFR. 151 patients (60.4%) died during follow-up. Mortality was associated with age (HR 1.04, 95% IC 1.02-1.06; p=0.0002) and anemia (HR 2.06, 95% IC 1.46-2.90; p=0,0004).



Patients with anemia had lesser median of survival (364 vs 1039 days). Anemia was associated with mortality in patients older than 80 years (HR 1.81, 95% IC 1.13-2.89; p=0.01) and also in patients younger than 80 years (2.36, 95% IC 1.43-3.87; p=0.0007).
Conclusion: Anemia is frequently observed in COPD patients, and it is associated with mortality.

E514
Proportion and impact of anemia in COPD patients
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Systemic chronic obstructive pulmonary disease (COPD) manifestation as osteoporosis, cachexia, muscle wasting and systemic inflammation is actually established. Data concerning frequency and influence of anemia in COPD patients are not well known. We conduct a prospective study including 61 patients admitted in our department from 2005 to 2009 for COPD. COPD was confirmed in all cases by spirometric measurements. All patients had a blood count at admission. Anemia was defined as hemoglobin value <13g/dl.We had excluded patients with airflow limitation due to another lung disease and those presenting hemoptysis or another disease leading to anemia.
All patients were males and smokers. The average age was 67 years (47 to 80 years). COPD was classified stage I in 2%, II in 28%, III in 36% and IV in 34%. Comorbidity was found in 30%: diabetes (11%), cardiovascular disease (19%). Thirty six percent of COPD patients had anemia (average value is 11 g/dl) witch was normochromic normocytic in all cases and severe (hemoglobin <10 g/dl) in 18%. Anemia is not correlated with COPD severity (patients with severe COPD represent 54% of patients with anemia [G1] vs 79% of patients without anemia [G2]) neither to exacerbation's frequency (more than 2 exacerbations per year was noted in G2 33% vs 18% in G1). However, anemia is associated to more severe exacerbations needing non invasive ventilation (13% of G1vs 10% of G2) and to higher body mass index (BMI) [41% of G1 had a BMI > 25 vs 28% of G2]. Our results show a higth proportion of inflammatory anemia in COPD patients with more severe exacerbation in this case. Literature's results are discordant. More studies needed to be developped to clarify the relation ship between anemia and COPD.

E515
Sleep disturbance in patients with severe COPD
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Background: Sleep disturbance is a recognised clinical manifestation in patients with asthma. The impact of COPD symptoms on sleep quality has received less attention.
Objective: To investigate the effect of COPD symptoms on patients' perceptions of sleep quality, as a sub-analysis of a large study assessing variability of symptoms in patients with severe COPD.
Methods: Pulmonologists and GPs recruited 2441 patients with COPD (mean % predicted FEV_1: 38.8; mean age: 67.3 years) in a cross-sectional European observational study (NCT00722267). Patients were interviewed by telephone about their COPD symptoms and the impact on sleep quality and activities in the previous week.
Results: Overall, 2236/2419 patients (92.4%) perceived ≥1 COPD symptom (breathlessness, chest tightness, cough, phlegm, wheeze) in the 7 days prior to the interview. A quarter of the total population (n=646; 26.5%) reported that their symptoms had affected sleep quality during that period. Specific aspects of sleep disturbance were identified as follows: frequent waking during the night (n=516; 21.1%); difficulty falling asleep (n=461; 18.9%); and early waking in the morning (n=407; 16.7%). Furthermore, night time was identified as one of the most troublesome periods of the 24 hours for a % of patients reporting: breathlessness (10.6%), chest tightness (16.7%), cough (17.3%), phlegm (11.8%) or wheeze (25.1%).
Conclusion: In this large cohort of severe COPD patients, symptoms had an impact on sleep quality, with night time being reported as particularly symptomatic. Sleep disturbance can therefore be considered an additional feature of COPD, as well as being a feature of other chronic respiratory diseases, including asthma.

E516
Assessment of fatigue in a large COPD cohort
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The Functional Assessment of Chronic Illness Therapy (FACIT)-Fatigue scale was used to assess fatigue at the baseline of the Evaluation of COPD Longitudinally

Table 1. Characteristics of COPD subjects split by FACIT-F score

	Fatigue score (FACIT-F)			
	High Fatigue 1st Qrtl (n=517)	2nd Qrtl (n=504)	3rd Qrtl (n=551)	Low Fatigue 4th Qrtl (n=536)
Age (years)	63 (7)	63 (7)	64 (7)	64 (7)
Females (%)	39	34	34	31
BODE Index	4 (2)	3 (2)	3 (2)	2 (2)
Six minute walk (meters)	315 (122)	352 (114)	383 (112)	420 (115)
Post-bronchodilator % FEV1	44 (15)	48 (16)	48 (16)	52 (15)
2+ Exacerbations prior year (%)	30	23	18	15
SGRQ-C Total score	69 (13)	55 (15)	45 (16)	32 (16)
Depression (CES-D ≥16)(%)	62	30	12	3
Dyspnea (mMRC score >2) (%)	43	23	13	6

Values are expressed as means (SD) or frequencies.

to Identify Predictive Surrogate Endpoints (ECLIPSE) study to compare fatigue between COPD and non-COPD and examine its determinants in COPD subjects.
Data from 2108 COPD subjects, 334 non-COPD smokers and 241 non-COPD nonsmokers were analysed. Median (IQR) values for FACIT-F score were 37 (28-44) for COPD, 47 (41-50) for non-COPD smokers and 49 (44-51) for non-COPD non-smokers. Within the COPD cohort, fatigue increased with increasing GOLD stage. Splitting the FACIT-F score into quartiles demonstrated significant relationships between increasing fatigue and worse quality of life, lung function, distance walked, frequent exacerbations and respiratory symptoms.
COPD subjects suffer from more fatigue than a comparable non-COPD population. Fatigue increases with COPD severity and is associated with worse physiological, subjective & functional outcomes.
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