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Introduction: Chronic obstructive pulmonary disease (COPD) is associated with low-grade systemic inflammation and autoinmunity. Their relationship with relevant clinical outcomes is unclear.
Objectives: To evaluate the relationship of systemic inflammation and markers of autoimmunity with two clinically relevant outcomes, namely number of hospital admissions for respiratory disease and all-cause mortality.
Method: We studied 342 patients with clinically stable COPD recruited into the PAC-COPD study (68±9 yrs., FEV1 52±16% ref, FEV1/FVC 54±12%, x±SD) who were followed up for 3 years. At recruitment, we determined the serum concentration of C-reactive protein (CRP [nephelometry]), pro-inflammatory cytokines (IL6, IL8 and TNFa, [ELISA]), oxidative stress markers (carboniles, nitrotyrosines, malondialdehyde (MDA) by ELISA) and circulating antinuclear (ANA) and anti-tissue (AT) antibodies (by immunofluorescence).
Results: We observed that, at recruitment: (1) levels of CRP (9.9±20.6 vs. 7.2±15.5 pg/ml) and IL-8 (5.6±3.9 vs. 4.8±3.4 pg/ml) were higher ($p<0.01$), and those of MDA lower (8.28±5.52 vs. 9.78±5.63 mM), in patients who subsequently required hospital admissions during follow up; and, (2) levels of CRP (10.8±18.6 vs. 7.8±17.5 pg/ml), carboniles (0.23±0.10 vs. 0.19±0.09 nmol/mg), nitrotyrosines (83.8±48.3 vs. 65.1±47.9 nM) and AT antibodies (22% *vs* 12%) were higher ($p<0.05$) in patients who died during follow-up.
Conclusions: Systemic inflammation and autoimmunity influence important clinical outcomes in COPD.
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466. COPD mechanisms

P4533
Fibrotic component in patients with emphysema reduces both exercise capacity and quality of life and increases exacerbations
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Background: Characteristics of the combined pulmonary fibrosis and emphysema (CPFE) remain to be elucidated. Little is known regarding the effect of the fibrotic component on exercise capacity, quality of life (QOL), and exacerbations.
Methods: A total of 220 smokers (current or ex-smokers) with and without COPD were recruited. The fibrotic component, defined as reticular opacities and honeycombing, was graded according to the Kazerooni score and the existence and severity of the the extent of emphysema were determined also by HRCT. Data on age, gender, smoking history, pulmonary function, body mass index (BMI), exercise tolerance (6-min walking test; 6MWT), modified Medical Research Council (MMRC) Dyspnea Scale and Oxygen Cost Diagram (OCD), QOL (St. George's Respiratory Questionnaire; SGRQ), and outcome data were collected. The association between the fibrotic component and exercise tolerance, QOL, and exacerbations were studied with adjustment by emphysema.
Results: The subjects (age, 68.9±9.6 years; M/F: 196/23) included 176 patients with emphysema and 64 patients with CPFE. The fibrotic component worsened hypoxemia during the 6MWT ($p < 0.05$). In CPFE, the severe fibrotic component resulted in worsened dyspnea (MMRC Dyspnea Scale, $p <0.03$; OCD, $p <0.02$), reduction in the distance in 6MWT with borderline significance ($p = 0.08$), and reduction in the minimum blood-oxygen saturation level ($p < 0.01$); further, the severity of the fibrotic component was positively associated with exacerbations ($p < 0.04$) and hospitalization ($p < 0.01$).
Conclusions: In CPFE, fibrotic change worsened both dyspnea and exercise capacity and also increased exacerbations.

P4534
Relationship of systemic inflammation and autoimmunity to clinically relevant outcomes in COPD
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P4535
Metabolic phenotype and adipose tissue inflammation in patients with chronic obstructive pulmonary disease
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Rationale: Potential links between metabolic derangements and adipose tissue inflammation in patients with chronic obstructive pulmonary disease (COPD) are unexplored. We investigated adipose tissue expressions of interleukin (IL)-6, tumor necrosis factor (TNF)-alpha, CD68 (macrophage cell surface receptor), caspase-3 and Bax, and their relationships to the metabolic phenotype in nine cachectic, 12 normal-weight, 12 overweight, and 11 obese patients with stable COPD (age 62.3±7.2 years).
Methods: Body composition was assessed by Dual Energy X-Ray Absorptiometry, and insulin sensitivity by euglycemic hyperinsulinemic clamp. Subcutaneous adipose tissue samples were analyzed using real-time PCR.
Results: With increasing body mass index, increases in adipose tissue expressions of IL-6, TNF-alpha and CD68 were observed ($p<0.001$; $p=0.005$; $p<0.001$, respectively), in association with reduced insulin sensitivity ($p<0.001$). No differences were observed between cachectic and normal-weight patients in adipose tissue expressions of inflammatory or proapoptotic markers. Adipose tissue CD68 and TNF-alpha expressions predicted insulin sensitivity independently of known confounders ($p=0.005$; $p=0.025$; $R^2=0.840$).
Conclusions: Our results suggest that adipose tissue inflammation in obese COPD patients relates to insulin resistance. Cachectic patients remained insulin sensitive, with no significant upregulation of inflammatory or proapoptotic markers in the adipose tissue.
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P4536
Anemia predicts mortality after COPD exacerbation
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Anemia is a recognised pronostic factor in many chronic illnesses,but there is limited information about its impact on outcomes in patients hospitalized due to an acute COPD exacerbation (AECOPD).

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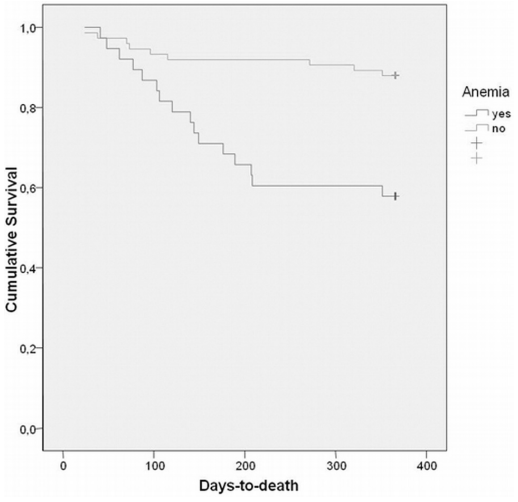
Aim: To investigate whether anemia exert an effect on mortality after 1 year of follow-up.
Methods: From November 2007 to November 2009 we recruited 117 patients who required hospitalisation due to an AECOPD.We collected demogrhaphic data, nutritional status, hemoglobin (Hb), hematocrite (Ht) and lung function. Patients were followed up during 1 year. Mortality and days-to-death were collected.
Results: Mean age 72 (SD±9); FEV_1 38 (SD±12); mortality after 1 year was 21,4%. Comparing those who died to those who survived we found significant differences (p<0,000) in Hb (12,4 vs 13,8 mg/dl) and Ht (38 vs 41%). Anemia (Hb<13 g dl^{-1}) prevalence was34%. Those who died had had 4 exacerbations in previous year vs 2 exacerbations in the case of the survivors (p=0,007). Lung function and nutritional status were similar, except for muscular mass (35 vs 39%; p=0,015) and albumine (33 vs 37mg/dl; p=0,039). These variables were included in a multivariable analisys, Hb and previous exacerbations resulted as independent factors for mortality. Mortality risk for patients with anemia was 5,6 (CI: 1,6-20,1); for patients with >1 exacerbation in the previous year was 6 (CI: 1,3-127,1).



Conclusion: Anemia and previous exacerbations were independent predictors of mortality after 1 year in patients hospitalized due to ACOPD.

P4537
Relation of cardiac enzymes and echocardiographical findings with long-term mortality after chronic obstructive pulmonary disease exacerbation
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Background: Patients with chronic obstructive pulmonary disease (COPD) are at increased risk of cardiovascular disease, exacerbations of which increase strain on the heart. In our study, effects of cardiac enzymes and echocardiographical findings to the long term mortality in patients with respiratory insufficiency due to COPD attack
Methods: From the Yedikule hospital database, 208 patients discharged after treatment for COPD exacerbation in the period 2006–2009 were identified and followed-up until January 30, 2011. Median observation time was 40 mounth. In 208 patients, measurements of cardiac-specific enzymes (troponin, hearth type fatty acid binding protein (H-FABP), NT-ProBNP, CK-MB) were available. Also electrocardiografic, echocardiography findings and arterial blood gas analysis (ABG) of the pateints were recorded. Clinical data were retrieved from patient records and date of death was obtained from the Turkish National Registry.
Results: In the univariate analysis; troponin levels, left ventricular ejection fraction, having right ventricule dysfunction were statistically significant. In multivariate analysis; elevated cTnI was significantly associated with increased all-cause mortality in the observation period (p<0.001).
Conclusion: Chronic obstructive pulmonary disease patients with elevated cardiac-specific Troponin I during exacerbation are at increased risk of death after discharge.

P4538
Relationship between osteoporosis and adipose tissue leptin and osteoprotegerin in patients with chronic obstructive pulmonary disease
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Introduction: The role of fat-bone interactions in the pathogenesis of osteoporosis in chronic obstructive pulmonary disease (COPD) is poorly understood. We investigated adipose tissue (AT) expressions of leptin and osteoprotegerin (OPG) and their relationships to osteoporosis in COPD.
Methods: In 39 patients with stable COPD, bone mineral density (BMD) and body composition was assessed by DEXA. Serum leptin and β-crosslaps were determined by electrochemiluminiscence immunoassays. Subcutaneous AT samples were analyzed using real-time PCR.
Results: Twenty-one patients without, and 18 with osteoporosis were enrolled (35 men; age 62.2±7.3 years). Compared to patients without osteoporosis, those with the disease had lower serum levels and AT expressions of leptin, and increased serum β-crosslaps (p=0.028, p=0.034, p=0.022, resp.). Log AT leptin was inversely related to serum β-crosslaps (p=0.015), and directly to leptin (p<0.001) and the total, femoral, and lumbar BMD and T-score (p<0.02 for all). AT OPG expression was related to all variables of bone density except for lumbar BMD (p<0.05 for all). Log AT leptin and OPG expressions predicted femoral T-score independently of age, gender and pulmonary function (p<0.001, R^{2}_{adj}=0.383; p=0.008, R^{2}_{adj}=0.301, resp.). Introducing body or fat mass index into these models eliminated independent predictive value of leptin and OPG expressions.
Conclusion: Our results suggest that adipose tissue leptin and OPG expressions are related to osteoporosis in patients with COPD, and appear to act as mediators between fat mass and BMD.
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P4539
Reduced grip strength is related to frequency of exacerbations and lower health status in COPD
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Muscle weakness is a feature of COPD that affects quality of life. Systemic inflammation, an accompaniment of acute exacerbations, has been implicated in its aetiology. Recurrent exacerbations are also associated with lowered health status. This study examines the relationship between muscle weakness, health status and exacerbation frequency in a cohort of patients with COPD.
This is an observational study of 188 (95 female) COPD patients attending two hospital clinics in the North –East of England. We recorded spirometry, health status (SGRQ), grip strength (Jamar), MRC dyspnoea score and the reported frequency of exacerbations in the previous year.
Patients were aged 72.5±8.3 years with MRC score of 3.6±0.8, FEV1 of 49.2±21.5 percent predicted and a total SGRQ score of 72.2±15.5. Grip strength, expressed as percent predicted, was 72.0±21.8 in men and 81.0±18.2 in women (mean ± SD). Exacerbations ranged from zero to five in the previous year and there were associations of reduced grip strength with exacerbation frequency ($\chi 2 = 9.63$; p = 0.0019) and lower health status ($\chi 2 = 34.0$; $p < 0.0001$).

Outcomes and number of exacerbations

	Number of exacerbations & subjects					
	0; n=23	1; n=8	2; n=13	3; n=37	4; n=90	5; n=17
Age	71.8±9.1	69.7±	75.6±6.3	73.2±8.6	72.5±7.7	70.8±10.4
Male / female	12 / 11	3 / 5	6 / 7	24 / 13	37 / 53	11 / 6
% Predicted grip	89.6±12.2	91.0±12.8	83.2±11.2	70.3±20.1	79.9±17.9	42.8±10.3
SGRQ	55.0±15.1	63.3±11.5	68.1±15.7	72.3±14.4	79.9±17.9	84.4±8.9
MRC Dyspnoea Score (1–5)	3.1±0.8	3.2±0.4	3.7±1.1	3.9±0.8	3.6±0.9	3.5±0.8

Conclusion: Our data clearly demonstrate that reduction in grip strength is greater in patients with a history of frequent exacerbations and is associated with reduced health status.

P4540
Gender differences in formation of endothelial dysfunction (ED) extension in COPD patients
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ED is one of the most important branches in pathogenesis of cardio-vascular events (CVE). It is established that soluble intercellular adhesion molecule-1 (sICAM-1) is one of the markers of ED. But it is known little about ED in COPD patients (pts) particularly in accordance with gender features.
Aim: To study the ability in prognosis of ED extension in COPD pts due to gender.
We studied 93 pts in stable phase of COPD, divided into 2 groups: 1st – 61 (65.6%) male (age – 63.0±1.1 yrs, 56 (91,8%) smokers with index "pack/year" – 38.7±2.7), 2nd – 32 (34.4%) female (age – 57.5±1.9 yrs, 8 (25%) smokers with "pack/year" – 16.5±3.9). Measurements included clinical status, spirometry, serum level of sICAM-1 (ng/ml) by ELISA.
Results: The level of sICAM-1 was significantly higher in male with COPD than in health male, but there were no differences between levels of sICAM-1 in female with COPD and in health female (table). Due to stages of COPD there was no correlation between sICAM-1 and FEV_1 in the 1st group (r=0.175 (p>0.05)), but there was negative correlation in the 2nd group (r= -0.373 (p=0.046)).

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Groups	sICAM-1
1st	520,3±39,0
2nd	607,8±73,6
Control male (n=10)	345,0±55,2
Control female (n=8)	503,8±78,9

p1-control male <0,05, p2-control female >0,05.

Conclusion: Male sex is a risk-factor of ED extension and CVE in COPD pts in the whole, but female sex is a risk-factor of ED extension and CVE only during progression of COPD.

P4541

COPD GOLD stage 1: Is it really a disease?

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Background: GOLD sought to standardize COPD definition and severity. The clinical meaning of GOLD 1 and it putative progressive nature remains uncertain.
Objective: To determine the characteristics of COPD GOLD stage 1 and it progressive nature.
Methods: This research is part of the Canadian Cohort Obstructive Lung Disease (CanCOLD), a prospective longitudinal study with a population-based sample of COPD. Subjects are recruited from 9 cities in one of 4 subsets (sex and age matched): 1) COPD GOLD ≥2; 2) GOLD 1; 3 and 4) non-COPD controls, i.e., at risk (ever smoker) and healthy. Measurements were done at baseline and 3-5 years later.
Results: This preliminary analysis included 111 subjects. GOLD 1 subjects as compared to GOLD ≥2 had less wheezing (20% *vs* 41%, p=0.048), physician-reported asthma (14% *vs* 41%, p=0.007), and better health status (SF-36): PCS (49 *vs* 46, p=0.191) and MCS (54 *vs* 50, p=0.002). GOLD 1 subjects were less likely to have a physician-diagnosed COPD (6% *vs* 17%, p=0.031) and to be prescribed respiratory drug (16% *vs* 38%, p=0.007). Subjects with GOLD 1 as compared to non-COPD control reported more dyspnea MRC ≥2/5 (39% vs 20%, p=0.082) but chronic bronchitis and level of health status (SF-36) were similar. Annual change in FEV_1 were -62 ml/year (p<0.001) for GOLD 1, -32 ml/year (p=0.006) for GOLD ≥2 and -25 ml/year (p=0.18) for non-COPD. Annual change in physical health (SF-36 PCS) were -0.42 (p=0.086) for GOLD 1, -0.89 (p=0.023) for GOLD ≥2 and -0.20 (p=0.54) for non-COPD.
Conclusions: Early disease or GOLD stage 1 appears to be associated with more rapid decline in FEV_1 and worsened health status.
Funding: CIHR Rx&D Collaborative Research Program; and the Respiratory Health Network of the FRSQ.

P4542

Anemia in chronic respiratory failure

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Background: In patients with severe chronic obstructive pulmonary disease (COPD), anaemia is common and associated with impaired long-term survival and quality of life. Whether anaemia is also prevalent in patients with other severe, non-inflammatory respiratory diseases has not yet been systematically tested.
Methods: In 595 patients with obstructive (OD, 54.8%) or restrictive disease (RD, 45.2%) and chronic respiratory failure (CRF), anthropometric data, laboratory parameters, lung function, blood gases and co-morbidities were assessed prior to initiation of home mechanical ventilation. Patients were classified as anaemic based on haemoglobin (Hb) levels (Hb <12/13g/dl, female/male). Patients with known causes for anaemia were excluded.
Results: In patients with CRF the prevalence of anaemia was 13.3% and not different between RD (11.5%) and OD (14.7%) (p=0.276). A sex-related difference occurred only in OD (7.9% (f) versus 17.3% (m); p=0.035). Patients with OD and anaemia presented with higher age (p=0.003), pH (p=0.014) and arterial oxygen pressure (PaO_2) (p=0.012), lower body-mass index (BMI) (p=0.011) and total protein (p=0.012), and higher rates of coronary heart disease (p=0.01), cardiac arrhythmia (p=0.014) and diabetes mellitus (p=0.003) in comparison to non-anaemic patients. In patients with RD anaemia was associated with higher age, (p=0.008), pH (p=0.011) and lower leucocytes numbers (p=0.006).
Conclusions: Anaemia is frequent not only in COPD but also in other severe respiratory diseases combined with CRF. It was associated with advanced age, several co-morbidities, impaired nutritional state and elevations of pH and PaO_2, probably due to hyperventilation. Its prognostic impact has to be elucidated in future studies.

P4543

Association of inflammation and bronchial hyperresponsiveness

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Bronchial hyperresponsiveness (BHR) is known to be linked to decline in lung function, only limited data are available as to whether BHR is associated with systemic inflammation in COPD.
Aim: To compare serum biomarkers of patients with COPD and chronic bronchitis (CB) and to assess local and systemic inflammation in COPD depending on BHR.
Methods: At 59 outpatients (50-COPD II st and 9-CB) with smoking more 10 pack/years serum concentrations IL-6, IL-8, TNF-a, CRP were analyzed. BHR was assessed in metacholine challenge. Induced sputum samples were obtained from 42 COPD patients.
Results: Serum IL-6 and IL-8 in COPD patients were higher in comparison to CB patients: the medians difference was 1,44 pg/ml and 2,10 pg/ml, respectively (p<0,05). Levels TNF-a, CRP were higher in COPD patients, but did not reach statistical significance. Among CB patients BHR revealed at 1 of 9. Among COPD patients BHR revealed at 31 of 50 (62%). The pack/years were comparable in CB and COPD patients.
Serum IL-6 and IL-8 in COPD patients with BHR were higher in comparison to COPD patients without BHR: the means difference was 2,80 and 2,67 pg/ml, respectively (p<0,05). There were not differences between TNF-a and CRP in COPD patients depending on BHR.
COPD patients with BHR had significantly higher numbers of total cell counts and macrophages in induced sputum than COPD patients without BHR: 3,63 vs $2,30\times10^6$ cells mL^{-1} and 1,31 vs $0,37\times10^6$ cells mL^{-1} (p<0,01). No differences were found for FEV_1 and pack/years in COPD patients.
Conclusion: Serum biomarkers at COPD patients with BHR were considerably higher in comparison to CB and COPD patients without BHR. BHR in COPD is associated with more intensive local airway and systemic inflammation.

P4544

Body mass index, central obesity, and severity of chronic obstructive pulmonary disease (COPD)

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Aim: To assess impact of body mass index (BMI) and central obesity (CO) to COPD severity.
Material and methods: We performed a cross-sectional study including 248 subjects with COPD aged 48-58 yrs with smoking experience 18-25 yrs and more than 15 cigarettes smoked per day. The first group consisted of 123 obese subjects, i.e. BMI > 30, while the second group included 125 subjects with CO, i.e. waist circumference > 102 cm for men and 88 cm for women.
Results: In the first group we found 17 subjects with mild COPD (13.8%), 79 subjects with moderate COPD (64.2%), 25 subjects with severe COPD (20.3%), and 2 subjects with very severe COPD (1.6%). The distribution of the subjects with COPD in the second group was as follows: mild COPD 54 subjects (43.2%), moderate COPD 52 subjects (41.6%), severe COPD 14 subjects (11.2%), and very severe COPD 5 subjects (4.0%). The difference in the distribution of the subjects by COPD severity between two groups was statistically significant ($P < 0.05$).
Conclusion: Our results suggest that body weight and central obesity may play a role in COPD severity.

P4545

The expression of brain-derived neurotrophic factor in hippcocampal and serum of chronic obstructive pulmonary disease model rats

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Objective: In clinic,we have found that cognitive impairment frequently occurs in chronic obstructive pulmonary disease (COPD) patients, but little is known about its pathogeny. And, researchers confirmed that brain-derived neurotrophic factor (BDNF) may be involved in the pathophysiology of cognitive impairment and is affected by many factors, for example, smoking, infection, hypoperfusion,

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hypoxia, et al. In this study, we aimed to explore the effects of passive smoking and intratracheal instillation of lipopolysaccharide (LPS), alone or in combination,on BDNF expression in hippcocampal and serum.
Methods: In consideration of smoking and infection are two main inducement of COPD, we established the rat COPD model by passive smoking and intratracheal instillation of LPS. Four rat groups were studied,with equal age and gender ratios in each: control (n=6), smoking (n=6), LPS (n=6) and smoking+LPS (n=6, COPD model). Level of BDNF in serum was measured by ELISA. And the expression of BDNF in hippcocampal was assessed using immunohistochemistry and image analysis method.
Results: We found that compared to controls, BDNF in hippcocampal and serum significantly increased after smoking, LPS and smoking + LPS exposure. However, BDNF increased less evident in COPD model than in smoking or LPS model both in hippcocampal and serum.
Conclusion: Smoking and intratracheal instillation of LPS (alone or in combination) exposure can increase BDNF level in hippcocampal and serum. Upregulation of BDNF may be paly a protective role in the early stage of smoking, LPS and COPD.

P4546
Changes in arterial stiffness during COPD exacerbations
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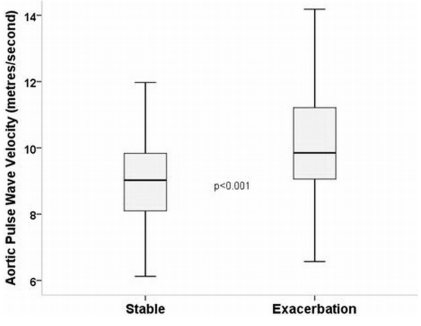
Arterial stiffness is a validated measure of cardiovascular risk and is increased in COPD. Risk for cardiovascular events is higher during COPD exacerbations *(Donaldson et al, Chest 2010)*. We hypothesised arterial stiffness would increase at exacerbation compared to the stable state.
We measured carotid-femoral aortic pulse wave velocity (APWV) using Vicorder™ apparatus in 55 patients from the London COPD Cohort in the stable state and at exacerbation onset, prior to therapy, defined by two consecutive days of new or increased symptoms requiring one major (dyspnoea, sputum purulence, sputum volume) and another major or minor symptom (coryza, wheeze, sore throat and cough).
Median time from exacerbation symptom onset to APWV measurement was 4 days and a mean interval of 42 days between the paired measurements.

Demographics and Clinical Characteristics of 55 COPD Patients			
	Stable State	Exacerbation	p-value
Mean (± SD) Age (years)	71.8 ± 8.6	-	-
Male Gender	56%	-	-
Current Smoking	18%	-	-
Median (IQR) Smoking (pack years)	47.0 (16.5,78.0)	-	-
Mean (± SD) BMI (kg/m^2)	26.5 ± 5.4	-	-
Mean (± SD) FEV_1 (L)	1.15 ± 0.41	1.02 ± 0.39	0.145
Mean (± SD) FEV_1 (%predicted)	48.6 ± 16.2	44.0 ± 0.13	0.160
Mean (± SD) FEV_1/FVC Ratio	0.47 ±0.15	0.44 ± 0.13	0.371
Mean (± SD) SaO2 (%)	94.7 ± 2.2	93.9 ± 2.7	0.135
Mean (± SD) Systolic BP (mmHg)	137.1 ± 20.1	139.7 ± 16.6	0.592
Mean (± SD) Diastolic BP (mmHg)	80.0 ± 10.9	81.5 ± 11.6	0.604
Mean (± SD) Heart Rate (beats/min)	76.0 ± 12.9	84.0 ± 13.8	0.029
Median (IQR) C-Reactive Protein (mg/L)	4.0 (2.0,8.5)	14.0 (4.0,42.0)	<0.001

Mean (± SD) APWV increased by 10.4% from 9.17±1.55ms^{-1} in the stable state to 10.12±1.85ms^{-1} at exacerbation (p<0.001) with no significant change in blood pressure.



Arterial stiffness increases during COPD exacerbations and is a potential mechanism of increased cardiovascular risk at this time. This raises the possibility of directly targeting arterial stiffness during exacerbations of COPD.

P4547
Total serum bilirubin levels are not related to the severity of COPD
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Introduction: It was recently reported that lower serum total bilirubin (tBLN) levels are associated with higher incidence of COPD and all-cause mortality, after adjustment for other risk factors, including smoking [1]. Aim of this study was to investigate whether serum total bilirubin levels are related to the degree of airflow limitation and other determinants of severity of COPD.
Methods: Data were extracted from the records of 1239 patients with COPD (58% males, age 64±10y, FEV_1 46±19%, BMI 25.4±5.3kg/m^2) referred for pulmonary rehabilitation. Serum tBLN >22μmol/L was an exclusion criterium. Lung function (FEV_1, diffusion capacity (DL_{CO})), arterial blood gases, body composition and six-minute walking distance (6MWD) were measured as part of integrated assessment of health status.
Results: tBLN levels were comparable in all GOLD stages. In male patients tBLN levels were 12.0±4.2μmol/L (GOLD 1), 12.1±4.0μmol/L (GOLD 2), 12.7±3.7μmol/L (GOLD 3) and 11.8±3.8μmol/L (GOLD 4), while levels were 10.8±3.7μmol/L (GOLD 1), 10.6±4.0μmol/L (GOLD 2), 10.2±3.6μmol/L (GOLD 3) and 10.6±3.8μmol/L (GOLD 4) in female patients (all p<0.001 vs males). tBLN levels were not related to FEV_1, arterial p_aO_2, BMI, number of pack years or 6MWD. A statistically significant but weak bivariate correlation was observed between tBLN and arterial p_aCO_2 (r =-0.084, p<0.01) and DL_{CO} (r=-0.070, p<0.01).
Discussion: Serum total bilirubin levels are neither related to the degree of airflow limitation nor to other variables of disease severity in patients with COPD. Further research is needed clarify a possible contribution of low tBLN levels to the development of COPD.
Reference:
[1] Horsfall LJ, Serum bilirubin and risk of respiratory disease and death, JAMA 2011.

P4548
Arterial stiffness measurements in COPD: Reliability over time
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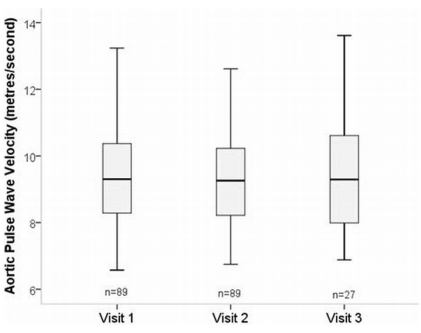
Measuring arterial stiffness is a non-invasive method of assessing cardiovascular risk and is raised in COPD. It is not known if this measure remains consistent over time in COPD, creating uncertainty in interpreting single measurements.
We measured carotid-femoral aortic pulse wave velocity (APWV) using Vicorder™ apparatus in stable patients from the London COPD Cohort (no exacerbations recorded on daily symptom diary cards in the preceding four weeks and subsequent two weeks).
APWV was measured at two visits in 89 stable patients and at a third visit in 27 of those patients. The median (IQR) interval was 103 (91,175) days between visits one and two, and 91 (84,98) days between visits two and three.

Demographics and Clinical Characteristics of 89 Stable COPD Patients	
	Mean ± standard deviation
Age (years)	71.9 ± 9.1
FEV1 (L)	1.29 ± 0.55
FEV1 (%predicted)	52.2 ± 19.6
FEV1/FVC Ratio	0.47 ± 0.13
BMI (kg/m2)	26.8 ± 5.6
	Percentage
Male Gender	63%
Current Smoking	20%
	Median (interquartile range)
Smoking (pack years)	49.0 (26.1,82.0)

Mean (±SD) APWV was 9.57±1.90ms^{-1}, 9.42±1.52ms^{-1} and 9.47±1.67ms^{-1} at



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respective visits with an intra-class correlation of 0.716 between visits one and two. Coefficient of variation of APWV over two visits was 5.99% and 6.42% over three visits.
Repeated measurements of APWV in stable COPD patients appear to be consistent several months apart, thus confirming reliability of this tool and enabling detection of changes in arterial stiffness with alterations in clinical status or therapy.

P4549

Evaluation of upper airway involvement and interleukin-8 levels in nasal lavage fluid of stable COPD patients

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Object: Sinonasal (upper respiratory) involvement in COPD has traditionally been a less frequented topic. IL-8 has been used to quantify the extent of airway inflammation. The aim of this study was to demonstrate the presence of upper airway involvement in COPD in patients with nasal symptoms by measuring IL-8 levels in nasal lavage material, while attempting to establish a possible link of such involvement with severity of disease.
Method: Forty-seven patients with different stages (I-IV) of COPD, as determined by GOLD criteria, along with 23 healthy controls were enrolled in this study. All patients underwent pulmonary function testing, and values for FEV1, FVC, FEV1/FVC,and medical history were recorded. Patients were also asked to fill out a "sinonasal outcome test" (SNOT-20) quality of life questionnaire. This was followed by rhinoscopic evaluation be upper airway. IL-8 levels in nasal lavage material were measured using ELISA method.
Results: Although the median IL-8 level of patients with stable COPD was higher than that for healthy controls, but the difference was insignificant (p=0.117). A longer history of cigarette smoking was correlated with a higher level of nasal IL-8 (p=0.042). IL-8 levels increased with disease stage (p=0.044). Patients with COPD had significantly higher SNOT-20 scores when compared with healthy controls (p=0.001). Our study results may support the "unified airway hypothesis" for COPD patients. The goal of treating sinonasal disease is to decrease the frequency of exacerbations while at the same time improving quality of life.

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