394. COPD mechanisms

P3581

Fibroblast growth factor 23 (FGF23) and hypophosphatemia in patients with COPD

Mohamed Elsammak[2], Adel Attia[1], Moosa Suleman[1]. [1]*Pulmonology, King Fahad Specialist Hospital, Dammam, Saudi Arabia;* [2]*Pathology and Laboratory Medicine, King Fahad Specialist Hospital, Dammam, Saudi Arabia*

Introduction: Previous studies highlighted the importance of phosphate depletion in COPD patients and the association between correction of hypophosphatemia and improvement in respiratory muscle function. Fibroblast Growth Factor 23 (FGF23) is a recently discovered circulating protein that plays a crucial role in renal phosphate reabsorption and body phosphate regulation. FGF23 has been investigated in several diseases but there is currently no published data about FGF23 in COPD.
Aims and objectives: The aim of this study was to evaluate whether FGF23 levels correlate with serum phosphate levels and disease severity in COPD patients.
Methods: 70 COPD patients aged 63.0±4.6 years and 34 age and sex matched randomly selected controls were studied. Criteria for diagnosing COPD and assessing severity were according to GOLD (Global Initiative for Chronic Obstructive Lung Disease) guidelines. Serum samples were analyzed for routine tests including calcium, phosphate, renal/lytes, and FGF23 levels were measured by a commercially available Eliza kit.
Results: There were no differences in serum calcium and Vitamin D levels in COPD patients and controls ($P > 0.05$). COPD patients had significantly lower serum phosphate levels compared to controls ($P < 0.01$). Plasma FGF23 was significantly higher in patients compared to controls: 280 (51-968) versus 140 (21-200) RU/ml ($P < 0.001$). As expected plasma FGF23 levels correlated negatively with serum phosphate ($r = -0.799$ & $P < 0.001$). Furthermore plasma FGF23 correlated negatively with FEV1 ($r = -0.352$ & $P = 0.003$)
Conclusion: This study illustrates a significant increase in plasma FGF23 levels that may contribute to low phosphate levels and disease severity in COPD patients.

P3582

Low testosterone in chronic obstructive pulmonary disease

Elena Cojocaru[1], Adina Turcanu[2], Raluca Mihaela Bercea[2], Cristian Cojocaru[2]. [1]*Physiology, University of Medicine and Pharmacy, Iasi, Romania;* [2]*Pneumology, Clinic of Pulmonary Disease, Iasi, Romania*

Aim: Among other comorbidities, COPD patients have fatigue and a low physical activity level. A low level of testosterone may explain some complaints mentioned by COPD patients. In this study we compared the testosterone level in COPD patients with that of elderly men with a normal pulmonary function.
Methods: Circulating levels of testosterone and luteinizing hormone were determined using chemiluminiscence technique in 34 patients (FEV1: 34.9% of the predicted values) and 20 control subjects. Moreover, the relationship of hypogonadism with 6-min walking distance, number of pack-year, systemic inflammation and LDL level has been studied in men with COPD.
Results: The testosterone level was lower in the COPD patients ($p=0.001$; <0.05). Low androgen status was related to LDL level and 6-min predicting walking distance. No correlation was observed between testosterone level and FEV1, CRP level, and number of pack-year.
Conclusion: Testosterone level is significantly lower in COPD patients comparing with control subjects. A restricted activity level is in correlation with testosterone level. Further studies are necessary to clarify the hypothesis that testosterone treatment could enhance the COPD patients activity level.

P3583

WITHDRAWN

P3584

The study of proton magnetic resonance spectroscopy on hippocampus in rats with chronic obstructive pulmonary disease

Xuefeng Ling[1], Yong Lin[2]. *[1]Department of Clinical Medicine, Southeast University, Nanjing, Jiangsu, China; [2]Respiratory Disease, Affiliated Zhongda Hospital of Southeast University, Nanjing, Jiangsu, China*

Objective: To employ in vivo proton nuclear magnetic resonance spectroscopy investigate the hippocampal metabolism of rats with Chronic Obstructive Pulmonary Disease and to assess if there is a relationship between brain metabolism and chronic brain injury in COPD.
Methods: Rats COPD model (model group, n=6) were established by passive smoking and intratracheal instillation of lipopolysaccharide (LPS), were compared with controls (n = 6), and all subjects underwent brain micro-magnetic resonance imaging (micro-MRI) and bilateral hippocampal proton nuclear magnetic resonance spectroscopy (^{1}H-NMRS) in vivo at 7.0 T. A neurochemical profile consisting of metabolite concentrations, *N*-acetylaspartate (NAA)/creatie (Cr) and choline (Cho)/Cr metabolite ratios in the hippocampus were evaluated and analyzed.
Results: 1. Rats COPD model were successfully established by passive cigarette smoking plus intratracheal instillation of LPS. 2. Compared with the normal group, The mean value of Cho/Cr is significantly altered in the bilateral hippocampal of COPD rat model ($p< 0.05$), but The mean value of NAA/Cr without difference ($p>0.05$).
Conclusion: Our results demonstrate that the metabolism is significantly altered in rats COPD model bilateral hippocampal, it is possibly one of pathophysiologies for the COPD complicated with chronic brain damage.

P3585

COPD: Different psychology status (PS) in the patients with different co-morbidity rate

Kateryna Gashynova. *Internal Medicine, DSMA, Dnipropetrovsk, Ukraine*

Aim: To evaluate whether and in which extent co-morbidity have influence on the PS in patients with COPD.
Study population: 120 outpatient men with COPD, stage III made the study sample. Exclusion criteria were 1) mental diseases; 2) presence of 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. Co-morbidity rate was established during analysis of patient's medical documentation.
Results: In accordance with co-morbidity rate all patients were divided on three groups (GR): GR I without any co-morbid condition, GR II –with 1-2 and GR III – with more than 3 co-morbid conditions. All groups were similar regarding to age and smoking status. One or more abnormalities in PS were found in 2 (10.53%) patients of Group I, in 63 (74.11%) – of Group II and 13 (81.25%) 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, n=19	28.7±9.1	25.1±3.9	22.4±1.4	22.4±4.5
II, n=85	40.3±4.5	39.3±4.5$^{\&}$	21.1±1.6	20.5±4.3
III, n=16	63.3±10.5$^{*\#}$	43.0±5.3*	23.4±0.3	38.3±2.5$^{\$@}$

*p (I-III) < 0.05; $^{\#}$p (II-III) < 0.05; $^{\&}$p (I-II) < 0.02; $^{\$}$p (II-III) = 0.001; $^{@}$ p (I-III) = 0.004

Conclusions: Co-morbid condition significantly impair psychology status in patients with COPD, and the most significant changes concerns depression, personal anxiety and vegetative lability level.

P3586

Arterial hypertension (AH) and endothelial function (EF) in patients with COPD

Tetyana Pertseva, Natalia Yefimova, Kateryna Gashynova. *Internal Medicine, DSMA, Dnipropetrovsk, Ukraine*

Objective: To investigate the influence of co-morbid AH at the EF in patients with COPD.
Materials and methods: A total of 41 men with stable COPD stages I-was observed. Mean age – 61,41±1,41 years, mean disease duration – 6,15±0,58 years. Group I consisted of patients without concomitant AH – 21 patient, Group II - with AH – 20 patients. Pulmonary function was evaluated by spirograph MasterLab (Jeger, Germany), endotelin-1 plasma level (ET-1) – by reagents "Diameb ®" (DRG, USA), the concentration of exhaled NO (FeNO) – by Niox Mino (Aerocrine, Sweden), Sa O2 – by pulse oxymeter (NONIN, USA).
Results: Both groups were comparable. In Group II the concentration of FeNO was significantly higher than in group I (14,81±1,59 ppb and 9,75±1,41 ppb, respectively ($p <0,05$)). In group II the level of ET-1 was similar to data in group I (0,81±0,02 ng/ml and 0,78±0,03, respectively ($p> 0,05$)). In group II the level of ET-1 significantly correlated with Sa O2 ($r = -0,38$, $p = 0.025$). We didn't found any significant correlation between EF and airflow obstruction.
Conclusions: High concentration of FeNO in COPD patients indicates the presence of more pronounced endothelial dysfunction in patients with concomitant AH; plasma levels of ET-1 in patients with COPD does not depend on concomitant AH; plasma levels of ET-1 increases with an increase in hypoxia in patients with COPD only if there is concomitant AH;
NO concentration in exhaled air and plasma levels of ET-1 in patients with COPD, regardless of the presence of an accompanying AH, does not correlate with indices of airflow obstruction.

P3587

The impact of comorbidities related to BMI in COPD patients

Carlos Cabrera Lopez[1], Jorge Zagaceta[2], Claudia Cote[3], Miguel Divo[4], Juan Pablo De Torres[2], José María Marín[6], Ciro Casanova[7], Victor Pinto-Plata[8], Javier Zulueta[2], Bartolomé Celli[4], Santiago Carrizo[2]. *[1]Pulmonary Medicine, Hospital Universitario de Gran Canaria Dr. Negrín, Las Palmas de G.C., Canarias, Spain; [2]Pulmonary Medicine, Clínica de Navarra/Universidad de Navarra, Pamplona, Navarra, Spain; [3]Pulmonary and Critical Care Medicine, Bay Pines Veterans Affairs Medical Center, Tampa, FL, United States; [4]Pulmonary and Critical Care Medicine, Brigham and Women's Hospital, Boston, MA, United States; [5]Pulmonary Medicine, Hospital Miguel Servet, Zaragoza, Spain; [6]Pulmonary Medicine, Hospital Nuestra Senora de la Candelaria, Santa Cruz de Tenerife, Canarias, Spain; [7]Pulmonary and Critical Care Medicine, St. Elizabeth's Medical Center, Boston, MA, United States*

Introduction: In COPD patients a higher BMI is associated with better survival (the obesity paradox). The mechanism of this paradox is not well understood. We explored whether different co-morbidities related to survival in patients with different BMI.
Methods: We followed 1664 COPD patients of the BODE cohort. A total of 80 comorbidities were systematically recorded. Comorbidities prevalence and association with mortality was explored using Cox proportional hazard stratified by BMI in four groups ($\leq$ 21, 22-29, 30-35, $\geq$ 36 kg/m^2).
Results: COPD patients with BMI $\geq$ 36 had significantly more comorbidities than the other groups but they had lower mortality, better FEV1 and lower BODE.

BMI grouping	BMI ≤ 21	BMI 22-29	BMI 30-35	BMI ≥ 36
n total	251	924	376	115
n alive	107 (42,6%)	588 (63%)	255 (68%)	87 (76%)
n dead	143 (57.3)	336 (37%)	121 (32%)	28 (24%)
Age (median and SD)	65±10.35	68±9	65±8.6	63.5±8.48
FEV1% (median and SD)	35±20.5	47±9.9	50±18.5%	51±17.3
BODE (median and SD)	6±2.7	6±2.8	3±2.4	3±2.35
Average # of comorbidities				
Alive (median and SD)	4± 3.3	6±2.8	5±3.4	7±4.6
Died (median and SD)	6±3	6±3.6	6±3.6	8.5±4.6
ANOVA	0.048	<0.0001	0.21	0.047

No specific co-morbidities had an independent association with mortality in this group whereas they did in the other subsets. Patients with a BMI between 22 and 35 had the most number of comorbidities associated with death.
Conclusion: In COPD, obese patients (BMI>36) have a better survival than non-obese patients, in spite of having more co-morbidities. In these obese patients there was no co-morbidity that was significantly and independently associated with mortality.

P3588

Fibrinogen, health status and hospitalization in patients with moderate to severe COPD

Vladimir Hodgev[1], Blagoi Marinov[2], Roman Kalinov[1], Lyudmila Vladimirova-Kitova[3], Fedya Nikolov[3], Stefan Kostianev[2]. *[1]Pulmonology Clinic, Medical University of Plovdiv, Plovdiv, Bulgaria; [2]Pathophysiology Dept., Medical University of Plovdiv, Plovdiv, Bulgaria; [3]Cardiology Clinic, Medical University of Plovdiv, Plovdiv, Bulgaria*

Background: There is evidence that COPD is a systemic illness. Serum biomarkers have been associated with clinically relevant variables.
Aim: To investigate the relationships between the blood level of fibrinogen and large group of clinical and functional parameters.
Patients and methods: Twenty-nine stable COPD patients (age [yr] = 63.4±8.6, FEV_1% = 37±11%, BODE index = 3.7±1.8) were enrolled in the study. Pulmonary function tests, blood-gas measurements; echocardiography, brain natriuretic peptide (BNP); 6-minute walking test (6MWT) and cardiopulmonary exercise test (CPET) on a treadmill were performed. In addition, health status was evaluated by SGRQ (St George's Respiratory Questionnaire) and CAT (COPD assessment test). The number of hospitalization, the need of antibiotic treatment and oral/intravenous corticosteroids (OICS) in the 12 months prior to evaluation were recorded.
Results: The mean value of fibrinogen was 3.0±0.8 [g/L]. Fibrinogen correlated significantly with health status - SGRQ (r =-0.49, p = 0.008), CAT (r =-0.44, p = 0.016) and hospitalizations (r = -0.50, p = 0.006), and OICS application (r = -0.48, p = 0.012). Differentiation of patients by value of fibrinogen (> 3 g/L ≤) discriminated them with respect to last year hospitalisations (1.8±1.9 vs 0.6±1.3; $p < 0.05$). A general linear model analysis was performed for SGRQ and hospitalisations and the following equations were derived: SGRQ = 146.7-2.56*VO_2max–5.68*FIBR–15.83*KCO (r=0.918; r^2=0.843, $p<0.001$) and Hospitalizations = 6.03–0.85*FIBR+3.71*KCO–0.011*6MWT (r=0.795; r^2=0.632, $p<0.05$).
Conclusion: Blood level of fibrinogen was related to health status and hospitalization in patients with moderate to severe COPD.

P3589

Ego defense mechanisms in COPD: Impact on health-related quality of life and dyspnoea severity

Saulo C. Albuquerque[1], Eduardo R. Carvalho[1], Rebeka S. Lopes[1], Igor S. Marques[1], Daniele S. Macêdo[2], Eanes D. Pereira[1], Thomas N. Hyphantis[3], André F. Carvalho[1]. *[1]Clinical Medicine, Federal University of Ceará, Fortaleza, Ceara, Brazil; [2]Department of Physiology and Pharmacology, Federal University of Ceará, Fortaleza, Ceara, Brazil; [3]Department of Psychiatry, University of Ioannina, Ioannina, Greece*

Purpose: To assess chronic obstructive pulmonary disorder (COPD) patients' defensive profile compared to healthy participants and to test whether specific ego defense mechanisms are associated with health-related quality of life (Hrolf) and self-reported dyspnoea severity.
Methods: In a cross-sectional study, we assessed in 80 patients with COPD and 80 age and gender-matched healthy participants, psychological distress (Hospital Anxiety and Depression Scale) and defense mechanisms/styles (Defense Style Questionnaire). Patients had their HRQOL evaluated with the St. George's Respiratory Questionnaire and underwent a comprehensive clinical evaluation with determination of functional parameters and dyspnoea severity.
Results: COPD patients presented higher scores in undoing, acting out, autistic fantasy, denial and splitting defenses compared to healthy-controls. Overall, patients showed a more immature (p=0.001) and/or neurotic (p=0.006) defensive profile. Higher scores of denial (p=0.044), somatization (p=0.009) and undoing (p=0.032) defenses were associated with poorer HRQoL, independently of the anticipated significant associations of clinical and psychological distress variables with impaired HRQoL. Somatization was strongly independently associated with more severe self-reported dyspnoea.
Conclusions: COPD patients exhibit a relatively immature and neurotic defensive profile. Pneumologists and consultation-liaison psychiatrists should consider the patients' underlying personality structure, especially somatization tendencies, since it is independently associated with HRQoL and dyspnoea severity.

P3590

Heart rate variability during the night in chronic obstructive pulmonary disease

Riccardo Inchingolo[1], Giuseppe Maria Corbo[1], Gregory Angelo Sgueglia[2], Gaetano Lanza[2], Salvatore Valente[1]. *[1]Pulmonary Medicine, Università Cattolica del Sacro Cuore, Roma, Italy; [2]Cardiovascular Diseases, Università Cattolica del Sacro Cuore, Roma, Italy*

Patients with chronic obstructive pulmonary disease (COPD) could have a lower oxygen saturation during the night compared to the day-time and it could affect autonomic modulation of heart rate. We studied the behaviour of heart rate variability (HRV) during the day-time versus the night in COPD patients.
30 stable outpatients were recruited and classified by BODE index. A 24 h electrocardiographic Holter recording and a transcutaneous measurement of oxygen saturation were performed at the same time. Lung function was also measured. Statistical analysis was made by linear regression.
According to BODE index, 13 patients belonged to first group (BODE 1=0-2), 8 to second group (BODE 2=3-4) whereas 9 were included in the third group (BODE 3=5-10).
During the night, we observed, compared to the day-time, a significant increase of both normal-to-normal (NN) intervals (i.e. a reduction of heart rate, 831 vs 720 msec, p=0.000), and Standard Deviation of all RR intervals (SDNN, 94.3 vs 85.5 msec, p=0.03), and High Frequency band (HF, 14.86 vs 10.97 msec p=0.0004) with reduction of ratio of low frequency to HF band (LF/HF ratio, 1.54 vs 1.96 p=0.09). Mean oxyhaemoglobin saturation (SpO_2) during the night was directly and significantly related to both SDNN (p=0.0018) and HF (p=0.057). Subjects with mean SpO_2 lower than 90% showed lower SDNN (60 vs 100 msec, p=0.012) and lower HF (8.2 vs 16.2 msec, p=0.04). LF/HF ratio was found unrelated to mean SpO_2 during the night, but a close inverse relationship was found with RV/TLC ratio (p=0.0058).
Our data demonstrated that in COPD patients both level of oxygen saturation of haemoglobin and impairment of static lung volumes could affect the cardiac autonomic modulation.

P3591

Changes in bronchial mucous membrane depending on the stage of COPD (I, II)

Tetyana Pertseva, Igor Ivakh, Oxana Plekhanova. *Internal Medicine Department, Dnipropetrovsk State Medical Academy, Dnipropetrovsk, Ukraine*

Aim: To determinate immune- hystochemical characteristics of bronchial mucous membrane depending on the stage COPD (I, II).
Study population and methods: 78 patients (pts) (mean age 54.2±2.4 years) with COPD were divided on two groups (Gr); Gr I – 32 pts with I stage (22 male), Gr II – 46 pts with II stage (31 male). Bronchoscopy with consequent histology sampling and assessing by microscopy and immunohistochemistry research was done for all pts. The following indexes were evaluated: Ki-67 (reflect proliferative potential and activity of epithelial regeneration); Cytokeratins 8 (Ctk8) (as a marker of glandular epithelium proliferation); 34βE12 expression (for estimation of squamous metaplasia).
Results: Both groups were similar regarding to age, gender and duration of disease. Results of immunihystochemistry present in table 1.

Groups	Ki-67 (M ± m, %)
I	2, 8±0.1*
II	8.3±0.3*

*p<0,05.

In Group I in all pts there were intensive positive membrane reactions with Ctk 8 in ciliary's and basal epithelial cells and absence of reaction with cytokeratin 34βE12. But there were not any microscopically signs of hyperplasia.
In Groupe II all pts took place intensive positive membrane and cytoplasmatic reaction with Ctk 8 in goblet and basal cells with morphologically signs of hyperplasia. Besides, in every sample there were foci with high Ctk 34βE12 expression in basal cells.
Conclusion: 1. Pts with COPD, stage I have significantly higher potential for the bronchial epithelial cells' regeneration in comparison with COPD, stage II. 2. Co-expression of both Ctk 8 and 34βE12 in COPD pts, stage II allows to suppose high risk of irreversible metaplasia in bronchial epithelium.

P3592

GERD and anxiety in patients with severe COPD

Sherif Alsayed. *Internal Medicine, NJCH, Jeddah, Saudi Arabia*

Objectives: To detect the impact of anxiety on shaping the prevalence of gastrointestinal reflux disease (GERD) in patients with severs chronic obstructive pulmonary disease (COPD).
Methods: We examined the prevalence of symptomatic GERD, using the Vigneri score, in 29 male patients with COPD. Esophageal 24 h pH monitoring was used to document the diagnosis of GERD in symptomatic group. Beck Anxiety inventory was used to detect the impact of anxiety on expressing GERD symptoms.
Results: Reflux disease symptoms were recorded in eighteen patients of the studied group (62%). GERD was diagnosed, based on esophageal 24 h PH monitoring, in only 11 patients of those who expressing symptoms of GERD. Mean of Anxiety score was correlated significantly with the number and frequency of symptom presentation in patient with symptoms of GERD reflecting the attribution of differnt symptoms of anxiety to the GERD syndrom. Also Anxiety scores correlated positively with time (total) PH reflecting the effect of anxiety on the sverity of GERD syndrom.
Conclusion: Patients with severe chronic obstructive pulmonary disease have a high prevalence of symptomatic gastro-oesophageal reflux. However True GERD was documented in a fewer number of them. Psychological factors, such as anxiety and somatisation may play a role, particularly in those patients without esophageal inflammation.

P3593

Is COPD a risk factor for thyroid disorders?

Laura Ciobanu[1], Vasile Maciuc[2], Roxana Costan[3], Andreea Gorga[4], Paula Alina Bobirca[4], Stefania Corduneanu[4]. *[1]Internal Medicine, University of Medicine and Pharmacy "Gr T Popa", Iasi, Romania; [2]Scientifical Research and Experimental Technique, "Gr T Popa" University of Agricultural Sciences and Veterinary Medicine, Iasi, Romania; [3]Endocrinology, County Emergency Clinical Hospital "Gr T Popa", Iasi, Romania; [4]Clinical Section of Respiratory Rehabilitation, Clinical Hospital of Rehabilitation, Iasi, Romania*

Introduction: Multiple endocrinological disorders are induced by CPOD through hypoxemia, hypercapnia, systemic inflammation and glucocorticoid administration; thyroid structural and functional derangements are amongst them.
Objectives: Our aims were to find out if COPD is a risk factor for thyroid disorders and what type of thyroid derangement is more specific to different COPD stages.
Methods: 2 groups of patients were assessed for age, gender, environment, smoking, alcohol intake, diabetes, dyslipidemia and thyroid disorder (autoimmune thyroid disease, nodular and nodulocystic goitre). First group was compound by non-COPD pts (N 148, 19 M/12.8%, 129 F/87.2%, mean age 61.33, SD 10.21) and the second one by COPD pts (N 137, 79 M/57.66%, 58 F/42.33%, mean age 64.34, SD 10.94). COPD pts were staged according to GOLD criteria in stage I 104/75.9% pts, stage II 22/16.1% pts, stage III 10/7.3 pts and stage IV 1/0.7% pts.
Results: There is a significant correlation between COPD and the presence of a thyroid disorder 0.123 ($p<0.05$). The relative risk to develop a thyroid disease in COPD pts is rather small 1.038 ($p<0.05$, 95% CI 0.24-0.77). There is also a low relative risk of 1.043 ($p<0.05$, 95% CI 0.24-0.83) for the COPD stage I pts to develop autoimmune thyroid disease.
Conclusions: COPD pts have a relative low risk to develop a thyroid disorder. In COPD stage I, with more individuals in this study, the risk was found higher for the autoimmune thyroid disease. Because generally at this stage there are no gasometric anomalies nor glucocorticoid interventions, we suggest that systemic inflammation is the most probable link; the inflammatory blood markers analysis should be taken into consideration for the next studies.

P3594

Systemic inflammation and nutritive status in patients with COPD

Kateryna Gashynova. *Internal Medicine, DSMA, Dnipropetrovsk, Ukraine*

Nutritional abnormalities are frequently occurring systemic complication of COPD. They often determinate functional capacity, health status and mortality of patients (pts). However, causes and mechanisms of weight loss are still under investigation.
Aim: The aim of study was to reveal influence of systemic inflammation on the nutritive status in pts with COPD.
Study population and methods: 69 men with stable COPD (Stage II-III) were surveyed.
Plasma C-reactive protein (CRP), spirometry, measurement of body mass index (BMI) and Fat Free Body Mass (FFBM) by means of bioelectrical impedance analysis were performed for all pts.
Results: In accordance with CRP level all pts were divided on two groups: Group I – pts with CRP $\leq$ 2.87 mg/l; Group II – pts with CRP > 2.87 mg/l.
Results of nutritive status examination present in table 1.

Groups	BMI<18.5, n (%)	18.5<BMI<24.0, n (%)	BMI>24.0, n (%)	BMI (M±m, kg/m^2)	FFBM (M±m, mg/ml)
Group I (N=27)	0 (0)	18 (66.67)	9 (33.33)	27.64±3.05*	17.46±0.96#
Group II (N=42)	3 (7.14)	31 (73.81)	8 (19.05)	19.33±2.41	13.14±1.33

*$p<0.05$; #$p<0.01$.

Conclusion:
- Increasing of CRP leads to significant decreasing of FFBM in pts with COPD.
- Despite the fact, that mean BMI was within normal ranges in both groups, it was significantly lower in pts with high CRP.
- Systemic inflammation associates with increasing of the general weight loss rate.

P3595

Bone mineral density in patients with COPD depending on pulmonary function parameters

Olga Kharevich[1], Irina Lapteva[1], Artem Tomashevsky[1], Natalia Porahonko[1], Natalia Vasilieva[2], Volha Vadzianava[2]. *[1]Pulmonology, Republic Scientific and Practical Centre of Pulmonology and Phthisiology, Minsk, Belarus; [2]Radiology, Republic Centre of Medical Rehabilitation and Balneotreatment, Minsk, Belarus*

Introduction: Osteoporosis is one of the most serious systemic effects of chronic obstructive pulmonary disease (COPD), which has serious consequences and significant impact on mortality, social and economic burden.
Aims and objectives: The aim of the study was to investigate the relations between pulmonary function parameters and bone mineral density (BMD) in patients with COPD.
Methods: In the recent research we have studied data of pulmonary function tests (by spirometry, bodyplethysmography, diffusing lung capacity) and BMD measurements by dual-energy X-ray absorptiometry in 24 patients with COPD. To compare BMD values in patients with $FEV_1 < 50\%$ and those with $FEV_1 > 50\%$, we used the Mann-Whitney test. Correlations were estimated by Spearman coefficient. Data are presented as median (interquartile range).
Results: There were significant differences between BMD values (T-score) in patients with $FEV_1 < 50\%$ (n=14, female-1, males-13, median age 56,5 [51; 61]) and those with $FEV_1 > 50\%$ (n=10, females-3, males-7, median age 56,0 [54; 58]) in lumbar spine (-1,7 [-2,4; 0,3] versus -0,3 [-0,6; 1,0], p=0,04) and in femoral neck (-1,7 [-2,6; -0,4] versus -0,5 [-0,7; -0,3], p=0,043). Correlation analysis revealed relations between BMD values and residual lung volume (Neck: r = -0,808, p = 0,005; Upper Neck: r = -0,697, p = 0,025; Total: r = -0,683, p = 0,029), ratio of residual lung volume to total lung capacity (Neck: r = -0,722, p = 0,018), diffusing lung capacity (Neck: r = 0,597, p = 0,039).
Conclusion: The results of the study confirm the role of lung function reduction in bone loss and osteoporosis development in patients with COPD.

P3596

Alpha1-antitrypsin deficiency: An analysis of patient subgroups of the German registry

Claudia Guttmann[1], Philipp M. Lepper[1], Monika Bachhuber[1], Christian Herr[1], A. Rembert Koczulla[2], Claus Vogelmeier[2], Robert Bals[1]. *[1]Dept. of Internal Medicine V, University Hospital of Saarland, Homburg, Saarland, Germany; [2]Dept. of Internal Medicine, Section of Pulmonary Diseases, University of Marburg, Marburg, Germany*

Objective: Alpha1-antitrypsin deficiency (AATD) is a rare hereditary disorder that affects liver and lung. The German AATD Registry includes patients with severe AATD. In this analysis, epidemiological, clinical and gender specific findings of the german AATD patients are analyzed. STUDY: Retrospective, population based study. AAT serum levels and genotypes, pulmonary function testing and various parameters including a St. Georges questionnaire, were recorded.
Results: A total of 713 adult (431 (60.3%) male, 278 (38.9%) female) patients with severe AATD, identified by genotyping, (568 patients with genotype PiZZ and 63 with PiSZ) were registered (82 patients with other genotypes). Mean AAT serum levels were 33.20±21.29 mg/dL. Most patients were smokers or ex-smokers (total 706 patients, 515 Smokers (72.3%; 66.2% male and 33.8% female) and 189 non-smokers (26.8%) who developed symptoms at the end of their third decade (mean age: 39.9 years, female: 39.9±12.9 years; male 40.0±11.6 years). In 88.7% specific lung symptoms led to final diagnosis. In 95.4% the final diagnosis led to smoking cessation. Most patients are affected by COPD (GOLD I = 7.7% (87% male and 13% female), II = 22.8% (53% male and 47% female), III = 27.3% (67% male and 33% female), IV = 15.3% (75% male and 25% female). 392 subjects receive substitution therapy. Cigarette smoking, and dust exposure are additional risk factors for early progression of COPD.
Conclusion: AATD is a rare condition however leads to significant morbidity in affected subjects. There were marked differences between COPD stage, with a clear predominance of higher COPD stages in men, but no differences in AAT serum levels between male and female patients.

P3597

Vitamin D receptor polymorphisms and exacerbation frequency in COPD

Jennifer Quint[1], Gavin Donaldson[1], Nancy Wassef[2], John Hurst[1], Michael Thomas[2], Jadwiga Wedzicha[1]. *[1]Academic Unit of Respiratory Medicine, University College London, United Kingdom; [2]Clinical Biochemistry, Royal Free Hospital, London, United Kingdom*

Background: Genetic variants in the vitamin D (vitD) pathway have been associated with COPD. FokI and BsmI polymorphisms in the vitD receptor (VDR) gene have been associated with muscle strength in COPD. These polymorphisms and the Taq1α VDR polymorphism have been associated with respiratory infection but they have not been investigated in COPD.
Methods: We studied 97 COPD patients (61 male, 28 frequent exacerbators (FE)); mean age 71.8 years (SD8.8) FEV1% predicted 50.3 (19.7), smoking history 50.7 (34.2) pack years. All patients were sampled in the winter (Jan/Feb/March) and summer (June/July/August) at baseline for vitD levels. Serum samples were tested for VitD(25-OH) by chemiluminescence based immunoassay. All polymorphisms were genotyped by forced RFLP (restriction fragment length polymorphism) using DNA extracted from blood. FEwere defined a priori as having $\geq$3 symptom based exacerbations per year, and infrequent (IE)<3.
Results: All genotypes were within Hardy Weinberg equilibrium. The FokI polymorphism was not related to TaqI or BsmI. The BsmI and TaqI polymorphisms

VDR polymorphisms and exacerbation frequency

SNP	Genotype	FE	IE	p value
BsmI	BB	3 (10.7%)	15 (22.1%)	
	Bb	12 (42.9%)	26 (38.2%)	0.43
	bb	13 (46.4%)	27 (39.7%)	
TaqI	TT	10 (38.5%)	24 (36.4%)	
	Tt	13 (50%)	29 (43.9%)	0.64
	tt	3 (11.5%)	13 (19.7%)	
FokI	FF	10 (35.7%)	21 (30.9%)	
	Ff	14 (50.0%)	38 (55.9%)	0.87
	ff	4 (14.3%)	9 (13.2%)	

were linked. There was no relationship with genotyping and exacerbation frequency for any of the polymorphisms.
There was a seasonal difference in vitD levels but this was the same for all polymorphisms; all $p>0.05$.
Conclusions: FokI, BsmI and TaqI VDR polymorphisms are not associated with exacerbation frequency and do not affect vitD levels in COPD.

P3598
Is there any correlation between apoptosis of the cells from bronchoalveolar lavage fluid (BALF) and the progression of chronic obstructive pulmonary disease (COPD)?
Agata Nowicka[1], Halina Batura-Gabryel[1], Mariusz Kaczmarek[2], Jan Sikora[2], Krzysztof Swierkocki[1], Anna Czyz[3]. *[1]Department of Pulmonology, Allergology and Pulmonary Oncology, Poznan University of Medical Sciences, Poznan, Poland; [2]Department of Clinical Immunology, Poznan University of Medical Sciences, Poznan, Poland; [3]Department of Hematology, Poznan University of Medical Sciences, Poznan, Poland*

Background: It has been already well known that neutrophilic inflammation, oxidative stress and protease/antiprotease imbalance play a significant role in the pathogenesis of COPD. In recent years some data were published, showing that also apoptosis may be one of the processes concerned in the pathogenesis of this disorder.
Objectives: We presumed that apoptosis of the cells (granulocytes, lymphocytes, macrophages) from COPD patients' bronchoalveolar lavage fluid increases along with the decline of FEV1 (forced expiratory capacity in 1 second).
Methods: 19 patients (16 men and 3 women), smokers or former smokers, diagnosed with COPD (stages 2-4) were enrolled into the study. The mean age was 64,95±7,83. In all subjects spirometry after the inhalation of beta-2-agonist was performed, to confirm the diagnosis of COPD according to GOLD criteria and to estimate FEV1. BALF during fiberoptic bronchoscopy was taken in all patients. We used annexin V to assess apoptosis of the cells concerned in BAL fluid. (BD Biosciences, Annexin V - FITC Apoptosis Detection Kit I)
Results: The median FEV1 was 38,6%. Only the patients with advanced COPD were enrolled into the study (max FEV1 55,3%, min FEV1 15,3%). In the group of patients with FEV1 lower than 38,6% median for apoptosis was 4% (0-59%), in the group with FEV1 higher than 38,6% median for apoptosis was 5% (3-16%). No correlation between FEV1 and apoptosis of the cells concerned in COPD patients BALF was found (p= 0,74).
Conclusions: Our data suggest that there is no correlation between apoptosis and the progression of COPD.

P3599
The regional distribution of body fat mass (BFM) in men with chronic obstructive pulmonary disease (COPD)
Aliaksandr Makarevich, Sviatlana Lemiasheuskaya. *Internal Disease, Belarusian State Medical University, Minsk, Belarus*

Introduction: COPD is associated with abnormal body composition and weight loss.
Aim: To evaluate the relations between BFM distribution and lung function in men during COPD progression.
Methods: We used dual-energy X-ray absorptionmetry for analyze of a body composition, the regional distribution of BFM as well as fat mass ratios of Android/Gynoid (A/G) and Arms+Legs/trunk. COPD pts (aged 40-69 yrs) were divided into the 3 groups according to disease severity: the 1st was made of 14 men (GOLD I stage; mean age 55 yrs; FEV_1 78%; BMI 27 kg/m^2, smokers 68%, packs/yrs 20); the 2nd - 43 pts (GOLD II stage; mean age 57; FEV_1 63%; BMI 28 kg/m^2, smokers 80%, packs/yrs 21); the 3rd - 20 pts (GOLD III stage; mean age 60 yrs; FEV_1 41%; BMI 24 kg/m^2, smokers 84%, packs/yrs 28). The control group was formed of 15 healthy men (mean age 56 yrs and BMI 26 kg/m^2, smokers 66%, packs/yrs 20).
Results: The A/G ratio was significantly lower in 3rd group vs. the control (1,1±0,3 vs. 1,3±0,2 respectively). This ratio in the 1st and 2nd groups did not differ from the control value. The similar picture was observed concerning Fat trunk%. Thus this level was 25±10 in 3rd group vs. 34±8 in the control group (p=0,02). The Arms + Legs/trunk ratio was higher in 3rd group as compare with the control (0,76±0,3 vs. 0,60±0,1; p=0,03). This ratio in the 1st and 2nd groups did not differ from the control. We detected the negative significant correlations between A/G ratio and packs/yrs index (r= -0,44) as well as among Arms+Legs/trunk ratio and FEV_1 (r= -0,33).
Conclusions: BFM redistribution (decrease A/G ratio and increase Arm+Leg/trunk ratio) take place in the course of COPD progression.