100. Physiology, heart failure and respiration in relation to OSA

P879

The effects of swimming training on alterations in structure and function of sternohyoid muscle of model rats of metabolic syndrome

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We investigated the effects of swimming training on alterations in structure and function of sternohyoid muscle in model rats of metabolic syndrome. Male Sprague-Dawley rats were randomly divided into 3 groups: control group (group A), MS group (group B), swimming training MS group (group C). The level of malondialdehy of sternohyoid muscles in group B was significantly higher than those of group A and group C.The Superoxide dismutase level of sternohyoid muscles in group B was significantly lower than those of group A and group C. The capillary density, capillary-to-fiber ratio (C/F), cross-sectional area of type I and II fiber, percentage of type I fibers of the isolated sternohyoid muscles in group B were significantly lower than those of group A and group C. In group B, mitochondrions were swelling, vacuolization and reduced, myofibril was dissolved focally. In group C, mternohyoid myofibril was arranged normally, ultrastructure of mitochondrion was normal roughly, occasionally vacuolization. The tensions of sternohyoid muscle of group B were significantly lower than those of group A and group C. In fatigue test, the tension percentages of sternohyoid muscle of group B were significantly lower than those of group A and group C. We concluded that the abnormalities in histological structure and ultrastructure of upper airway muscle induced by MS, via oxidative stress, led to reduction in contractile function in upper airway muscles, contributing to sleep apnea, and swimming training improved contractile dysfunction of upper airway muscles by inhibiting oxidative stress in MS.

P880

Mechanical ineffectiveness of augmented genioglossus activity in OSA during sleep is associated with diminished co-activation of the styloglossus

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The pathophysiological cause of OSA is sleep-induced decline in dilator muscle activation. However, dilator muscles activity often increases during obstructive apneas and hypopneas (OAHs), but fails to improve airflow. It has been postulated that neuromuscular activity does not increase sufficiently to overcome the negative pressures that develop during obstructed breathing. The present study evaluate this hypothesis.

Methods: Intramuscular GG-EMG, esophageal pressure (Pes) and airflow were recorded in 7 OSA patients. In 6 of the patients, we recorded also EMG of the tongue retractor styloglossus (SG-EMG). While awake, EMG/Pes was assessed while patients breathed through a variable resistor, to estimate the EMG required to prevent pharyngeal collapse. During sleep, EMG/Pes was evaluated during flow limitation. Pre-arousal peak inspiratory EMG (sleepEMG) was compared to peak EMG at the same Pes during wakefulness (awakeEMG). SleepEMG/awakeEMG (at equal Pes)>1 indicated a level of EMG sufficient to prevent pharyngeal collapse. **Results:** Patients had AHI of $51.7\pm10.5/hr$. OAHs triggered increasing negative Pes and increasing GG-EMG. SleepEMG/awakeEMG >1 was observed in all but one patient, with highest (mean of 5 events) ratios of 3.27 ± 1.81 . In contrast, SG-EMG maintained tonic activity in 4/6 of the patients during OAHs, and the ratio exceeded 1 in one patient only (0.68±0.58).

Conclusions: In OSA patients, large augmentation of GG-EMG can be observed without improvement in airflow. This mechanical inefficiency is not explained by high inspiratory suction pressures. Co-activation of tongue retractors appears to be reduced during sleep.

P881

Treatment with auto-servo ventilation of patients with sleep-disordered breathing, stable systolic heart failure and concomitant diastolic dysfunction – A randomized controlled pilot study

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Background: Systolic heart failure (HF) is frequently accompanied by diastolic dysfunction and sleep-disordered breathing (SDB). We evaluated, whether

auto-servo ventilation (ASV, BiPAP ASV, Philips Respironics) improves echocardiographic measures of diastolic function in patients with systolic HF and SDB.

Methods: 32 patients with stable systolic HF and concomitant diastolic dysfunction (age $66\pm9y$, LVEF $30\pm7\%$, NYHA class II 72%) and SDB (AHI $48\pm19/h$, 53% OSA) were randomized to either ASV (n=19) or optimal medical treatment alone (control, n=13). Polysomnography and echocardiography was performed at baseline and after 12 weeks.

Results: AHI improved significantly more in the ASV group compared to the control group (-38±18 vs. -0.2±13.2/h, P<0.001). At baseline, 24 (75%) patients had impaired left ventricular relaxation, and 8 (25%) had a pseudommalized filling pattern. At the 12-weeks control visit, diastolic function as assessed by the isovolumetric relaxation time (IVRT, -10.3±26.1 vs. 9.3±49.1, P=0.5) and deceleration time (DT, -43.9±88.8 vs. 12.4±68.8, P=0.4) did not significantly improve after ASV treatment. Likewise, the proportion of patients whose diastolic dysfunction improved was non-significantly higher in the ASV than in the control group, respectively (37% vs. 15%, P=0.2).

Conclusions: ASV-treatment efficiently abolishes SDB in patients with stable systolic HF and concomitant diastolic dysfunction. These data provide estimates of effect size and support the justification for the evaluation of the effects of ASV on diastolic function in larger randomized controlled trials.

P882

Gender-related association between respiratory stability and Cheyne-Stokes respiration in chronic heart failure – A matched control study $% A_{\rm s}$

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Introduction: Hypersensitive ventilatory feedback loop has major impact on the manifestation of Cheyne-Stokes respiration (CSA) in chronic heart failure (CHF). As CSA mainly affects male CHF patients (pts), this study aims to clarify the role of respiratory stability in the evolution of CSA in men and women.

Methods: We investigated 563 pts with CHF (91 female, LVEF \leq 45%, NYHAclass \geq 2) using echocardiography, cardiopulmonary exercise testing (CPX), cardiorespiratory polygraphy, measurement of hyperoxic, hypercapnic ventilatory response (HCVR), and standard laboratory. Adjusted for age (\pm 2 years), body mass index (BMI; \pm 2), and LVEF (\pm 3%) 79 matched pairs (male/female) were eligible for analysis.

Results: Obstructive sleep apnoea (AHI \geq 5/h) was present in 12 female (15.2%) and 13 male (16.4%) pts (p=n.s.), CSA (AHI \geq 5/h) in 30 (37.9%) female and 54 (68.4%) male pts (p<0.001). Parameters of respiratory instability (female vs. male: daytime pCO₂ 36.7 (interquartile range (IQR) 34.4-39.4) vs. 36.7 (IQR 34.8-38.7), VE/VCO₂ slope during CPX 34 (IQR 30-40) vs. 35 (IQR 31-40), HCVR 2.32 (IQR 1.71-3.49) vs. 2.69 (IQR 2.01-4.45) did not show a significant difference. Adjusted for age, NYHA-class, BMI, heart rate, LVEF, CRP, creatinine, NT-proBNP stepwise regression analysis revealed HCVR (p=0.03) an independent predictor for CSA in male pts.

Conclusion: These data suggest gender-related differences in the evolution of CSA. Additional studies are warranted to figure out a more sophisticated pathophysiological concept that may elucidate these findings.

P883

Sleep disordered breathing and the incidence of inappropriate ICD discharges

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Purpose: Previous studies confirmed inappropriate ICD discharges associated with an increased mortality in chronic heart failure (CHF). Sleep disordered breathing (SDB) is a known risk factor for new onset and reoccurrence of atrial fibrillation (afib). We therefore hypothesized that Cheyne-Stokes respiration (CSA) and obstructive sleep apnoea (OSA) impact inappropriate cardioverter-defibrillator (ICD) discharges.

Methods: A cohort of 172 patients (pts) with CHF (LVEF $\leq 45\%$, NYHA-class ≥ 2) and an implanted ICD device was studied. Patients underwent overnight polygraphy (noSDB (Apnoea Hypopnea Index (AHI) <5/h): n=54, OSA (AHI $\geq 5/h$, >50% obstructive events): n=59, CSA (AHI>5/h): n=59). During follow-up (36 months) inappropriate ICD-discharges and new-onset of afib (in pts with no present or history of afib, n=130) were documented.

Results: During follow-up 17 inappropriate ICD-discharges (5 tachyarrhythmic events, 4 lead dysfunctions, 4 oversensings, 4 sinus tachycardias), and 35 newonset afib episodes were documented. Stepwise Cox proportional hazard regression analysis adjusted for age, sex, ischaemic cause, BMI, preexisting atrial fibrillation (case 1 only), LVEF, LAD, VO2peak during CPX, NTproBNP, CRP, β -blocker, amiodarone, and NYHA-class revealed age as the only independent risk factor

Conclusion: Due to the large heterogeneity of underlying causes SDB is not associated with inappropriate ICD-discharges. Larger trials seem inevitable to clearly elucidate the impact of SDB on new-onset of afib in CHF pts.

P884

CPAP therapy in idiopathic pulmonary fibrosis (IPF) patients with obstructive sleep apnea $\left(OSA\right)$

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Background: Recent literature shows an increased incidence of OSA in patients with IPF. However, there are no published studies related to CPAP treatment in these patients.

Aims and objectives: We aimed to assess CPAP effectiveness and adherence in sleep and overall quality of life parameters in IPF patients with OSA.

Methods: Twelve patients with newly diagnosed IPF and moderate to severe OSA were included and CPAP therapy was initiated. The patients completed the Epworth Sleepiness Scale (ESS), the Pittsburgh Sleep Quality Index (PSQ), the Functional Outcomes in Sleep Questionnaire (FOSQ), the Fatigue Severity Scale (FSS), the SF-36 quality of life questionnaire and the Beck Depression scale (BDS) before and 1, 3, 6 months after CPAP therapy.

Results: Statistical significant improvement was observed in the FOSQ at CPAP initiation and after 1, 3 and 6 months (p: 0.02). Improvement, although not statistical significant, was noted in ESS score (p: 0.65), PSQI (p: 0.41), FSS (p: 0.43), SF-36 (p: 0.31) and BDS (p: 0.53). All patients had intense follow up by our CPAP Clinic. Two patients experienced difficulties in CPAP acceptance and stopped usage after the first month. Heated humidification was added in all patients in order to improve compliance.

Conclusion: Effective CPAP treatment, with intense follow up by the CPAP clinic, in IPF patients with OSA, results in a significant improvement in daily living activities based on the FOSQ namely an OSA specific follow up questionnaire. Improvement, though not statistical significant, was also noted based on other questionnaires, probably related to the multifactorial influences of IPF in physical and mental health.

P885

Obstructive sleep apnea syndrome and cardiovascular diseases risk in patients with COPD

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Purpose: To define the correlation between obstructive sleep apnea syndrome (OSAS) and increasing of cardiovascular risk in patients with chronic obstructive pulmonary diseases (COPD).

Design: There were examined 33 patients in the age of $63,93\pm1,59$ years with COPD stage 2 (85%) and stage 3 (15%). Duration of disease was: 10-14 years – 22 patients (67%) and 15-24 years–11 patients (33%). 60% of patients were smoking, index of smoking - 14,7 \pm 0,48 pack-years. Control group included 10 practically healthy persons.

Methods: Holter monitor test with rheopneumography, spirometry, X-ray examination, six-minute walk test, calculation of cardiovascular risk according to the scale SCORE (Systematic Coronary Risk Evaluation). Patients received basic therapy according to the recommendations of GOLD, 2009.

Results: 62% of patients had OSAS of mild stage and 38% - had OSAS of moderate stage (p<0,05). Duration of apnea cases varied from 259,0-1240,0 sec. 82% of patients had from 90 to 13990 cases of cardiac rhythm disturbances within 24 hours. Extremity index of heart rate (EIHR) varied during sleep - 2,1456 \pm 0,19. There were revealed correlations between duration of apnea cases and cardiovascular diseases risk (r=0,7136; p<0,05), number of heart rhythm disorders (r=0,7373; p<0,05), general cholesterol (r=0,7269; p<0,05). There was correlation between EIHR during sleep and OSAS (r=0,77; p<0,05). Patients had evidently increased risk for fatal complications according to the scale SCORE (r=0,8139; p<0,05): high risk level in 12,5% and very high - in 75% of cases.

Conclusions: Patients with both COPD and OSAS have evidently increased risk for fatal complications.

P886

The frequency of overlap syndrome in patients who were evaluated in sleep laboratory and its effects on severity of obstructive sleep apnea syndrome and quality of sleep

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'Overlap Syndrome' is togetherness of Obstructive Sleep Apnea Syndrome (OSAS) with Chronic Obstructive Pulmonary Disease (COPD) and asthma.We aimed to determine frequency of COPD and Asthma in OSASpatients and effect of these diseases on quality of sleep and severity of OSAS.Files of patients evaluated

in the sleep laboratory in January 2005-January 2010 were analysed. All cases were examined for COPD, Asthma and severe daytime sleepiness according to Epworth Sleepiness Scale (ESS).Pulmonary function tests and polysomnographic tests were administered to all.For diagnosis of COPD, GOLD criteria;for EEG scoring, Rechtschaffen - Kales criteria and for respiratory scoring, AASM 1999 criteria were used.Out of 998 cases 98.2% were diagnosed as OSAS, 11.1% COPD,6,6% asthma.11.2% of OSAS cases had COPD.Age, frequency of male sex and ESS were significantly higher in patients with OSAS and COPD than patients with OSAS-without COPD, no significant differences in terms of BMI and sleep parameters were found.In OSAS+asthma cases (6.7%); BMI, frequency of female sex and ESS were found to be significantly higher than in patients with OSASwithout asthma, no statistical differences were found in terms of sleep parameters. In older male patients with OSAS;COPD is more frequent than in younger female patients. Asthma is more frequently seen in OSAS than general population. In asthmatics, sleep efficiency is lower; thereby ESS is higher. No relation between severity of OSAS and presence of COPD or asthma was determined.In patients with OSAS, symptoms of COPD and asthma must be questioned and pulmonary function tests administered.

P887

Risk factors of hypercapnia in patient with obstructive sleep apnea

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The severe obesity sometimes leads to a chronic alveolar hypoventilation: obesity hypoventilation syndrome (OHS). The association with OSAS is frequent.

Aim: The aim of the present study is to specify favorisants factors that lead to hypoventilation in a population of obese persons with SAS and to deduct the type of association between OHS and SAS.

Methods: 62 patients were enrolled. We excluded patient with bronchial obstruction and we have compared anthropometric, functional, gazometric and polysomnographic details of the groupe1 (G1): OHS=9 and of the groupe2 (G2): obesity without hypoventilation=53.

Results: We haven't identify a difference between the two groups concerning age, sex, frequency of smokers, nasopharynx region abnormalities, AHI,SAS severity and the respiratory functional exploration. We noted that there is a positive interrelationship between BMI and Paco2. We identify severe gazometric perturbation in G1 (Pao2=61±9 mmHg, Paco2=50±7 mmHg) versus G2 we noted a moderate hypoxemia. Patients of the group1 make minimal desaturation of $63\pm17\%$ and a Sao2 average of $81\pm20\%$ what is meaningfully important than in the G2.

	Group 1 (n=9)	Group 2 (n=53)	р
Age (year)	47,56±12,55	51,4±12,27	0,45
Sex	Female 44,4%/Male 55,6%	Female 32,1%/Male 67,9%	0,42
Tabacco (PA	9,67±12,91	$11,72\pm17,41$	0,93
BMI (kg/m ²)	45,48±8,53	37,01±5,75	0,005
BMI >40	77,8%	24,5%	0,004
Snoring	88,9%	96,2%	0,38
Epworth Score	$14,38 \pm 4,56$	12,6±6,08	0,46
Nasopharynx region abnormalit	ies 44,4%	50,9%	1

Conclusion: The alveolar hypoventilation in SAS seems to be in correlation with the degree of obesity. The hypercapnie in the OHS is in relation neither with the SAOS nor with its severity. The OHS-SAS association is usual but not synonym; the OHS is an autonomous disease.

P888

The impact of OSA on nocturnal hypoxia in obese patients with chronic asthma

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Background: There is increasing evidence that asthma, obesity and OSA co-exist with resulting increased usage of health care resources. This cohort may have worse asthma control due to increased nocturnal hypoxia augmentating airway and systemic inflammation. The prevalence of OSA and degree of hypoxia in obese patients with asthma remains unclear.

Methods: A retrospective survey of obese patients with chronic asthma referred to the sleep clinic between 2009-2010 undergoing overnight sleep monitoring was undertaken using RemLogic software (in-hospital polysomnography). Scoring of the respiratory data was as per American Academy of Sleep Medicine (AASM) guidelines 2007. OSA was defined as an apnoea/hypopnoea index (AHI) of ≥ 5.0 /hour and moderate-severe as ≥ 15 /hr.

Results: 26 patients (19 females) were analysed. Mean (SD) BMI =45.2 (10.8)kg/m². Mean (SD) age=45.1 (12.2)yrs. Six had Type2 Diabetes Mellitus and 12 had hypertension. OSA was found in 12 (46%), 7 (27%) had moderate-severe OSA. Those with OSA were more likely to have T2DM (33vs12%). There

was no significant difference in BMI between the two groups. Those with OSA: (median (IQR))AHI=21.5 (13-45)/hr were more hypoxic during the night compared to those without OSA (AHI=2 (0.9-3)/hr). Mean nocturnal O2 sats (Mean (SD)): 91.6% (3.4) vs 95.3 (1.2) P=0.003, minimum O2 sats: 80.1% (11.8) vs 90.5% (2.0) P= 0.01.

Conclusions: OSA is common in obese patients with chronic asthma. Patients with OSA in this group were more hypoxic during the night. Clinicians looking after obese chronic asthma patients should consider screening for OSA. Prospective studies are required to further establish the prevalence of OSA in obese asthmatic patients, and the value of CPAP in this group.

P889

Complex approach in the study of clinical and functional features in patients with severe bronchial asthma with and without respiratory disorder during sleep

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Aim of study: Comparison of clinical and functional diagnostic criteria in patients with severe bronchial asthma and in combination with obstructive sleep apnea.

Materials and methods: 60 patients with severe asthma were divided into 2 groups: I group of patients with OSA were 30 patients (16 women and 14 men age (58,8±2,2) years) and II group of patients without OSA consisted of 17 women and 13 men age (50,5±2,1) years. In both groups FEV₁ ranged from (54,8±3,1) to (58,2±2,6)%).

The following studies were performed: respiratory function, polysomnography, daily blood pressure measurement, Holter monitoring of ECG.

Results: Asthma Control Test score revealed that patients with OSA had poor control of asthma symptoms (15,0±4,7) compared to patients without OSA (18,0±4,7) and higher scores for breathlessness scale MRCDS. Results of the questionnaire SQRG found that patients with OSA had more symptoms due to asthma and significant limitation of activity (67,1±3,8) than patients without OSA (60,2±4,7) (p <0.05). Patients with OSA had an increase in pulse blood preassure, minimum of daily, a maximum of night, and a marked increase in the average heart rate per night, the increase variability in blood pressure. In the night period, compared with patients without OSA, p <0.05.

Conclusion: The use of a wide range of diagnostic methods will allow for an adequate pathogenetic treatment and improvement of disease control in patients with severe asthma and in combination OSA.

P890

Cardiopulmonary exercise response in children with obstructive sleep apnea syndrome

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Introduction: Cardiopulmonary exercise testing (CPET) is a valuable tool in the evaluation of cardiac and pulmonary function. In adults' patients with obstructive sleep apnea syndrome (OSAS), recent studies addressed reduced exercise capacity, but there is no data in literature for pediatric patient.

Aim: To evaluate cardiopulmonary response to exercise in children with OSAS. Methods: Twenty seven subjects, without any systematic disease, aged 7 to 14 years (mean age 10,5 \pm 1,8 years), referring for evaluation of systematic snoring (\geq 4 nights/week), underwent overnight polysomnography (PSG) and CPET. According to the Apnea Hypopnea Index (AHI) subjects were divided into two groups: A. mild OSAS (1 \leq AHI<5, n=15), B. moderate – severe OSAS (AHI>5, n=12). Control group (group C) consisted of 13 children.

Results: There were no significantly differences in age, sex, BMI, among groups (p<0.05). Mild OSAS had 55,6% of children (group A) and moderate to severe 44,4% (group B). According to CPET children with OSAS had shorter duration of exercise (12,4±2,6min vs 13,3±2min), significantly lower VO2max (40,3±8,4 ml/kg/min vs 47,6±7,9 ml/kg/min, p=0,013), significantly lower VO2max (%) (77,7±15 vs 92,9±10,5, p=0,002), higher VO2AT (%) (48,2±14,7 vs 43,7±19,8) and higher systolic blood pressure level at peak exercise (145±27,4mmHg vs 143,92±20 mmHg) compared to control group. Children with mild OSAS had higher VO2max (%) (80,8±9,3 vs 73,8±19,7) but not statistically significant compared to moderate - severe OSAS.

Conclusion: The present study demonstrates that young patients (mean age $10,5\pm1,8$ years) with OSAS, even with mild OSAS, had reduced exercise capacity (lower VO2max) as compared to control group.

P891

Obstructive sleep apnea in patients with idiopathic pulmonary fibrosis Ahmed Sh. Mohamed¹, Ibrahim Ibrahim¹, Mohamed Hantera¹, ¹*Chest*

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Background: The outcome of patients with idiopathic pulmonary fibrosis (IPF) is poor. Breathlessness and coughing are usually progressive and about 50% of the patients die within 3 years after diagnosis. The role sleep disordered breathing in IPF should be investigated.

Objective: The aim of this study was to investigate obstructive sleep apnea and associated daytime sleepiness in IPF patients and investigate the correlation between IPF and OSA.

Subjects and methods: 28 patients with IPF and 10 control subjects matched on age and BMI were included in the study. Sleep quality and its daytime consequences were assessed by the Epworth Sleepiness Scale and all-night polysomnography. Results: 23 patients had an abnormal ESS (82.1%). 24 IPF patients (85.71%) had OSA; 21 patients (75%) had mild-to-moderate OSA, and 3 patients (10.71%)

had sovere OSA. AHI was statistically significant correlated with, ESS, FVC, and TLC.

The prevalence of OSA in IPF patients

	Normal	Mild OSA	Moderate OSA	Severe OSA
Patient no.	4	12	9	3
Patient %	14.29	42.85	32.14	10.71

Conclusion: Patienta with IPF are at high risk for OSA that may account for reversible daytime fatigue, possibly wrongly ascribed to IPF. Further, without treatment the sleep deprivation and lack of oxygen caused by sleep apnea increases health risks that have a significant negative effect on prognosis of IPF that already carries a poor prognosis.

Recommendation: Sleep evaluation should be extended to IPF patients routinely and the scientific work should focus on the improvement of sleep quality during sleep in these patients.

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P892

CPAP versus adaptive servoventilator (ASV) in patient with congestive heart failure and sleep disorder breathing

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Introduction: The aim of this study was to evaluate the effects of nocturnal ventilation by two different ventilatory support: CPAP or Adaptive Servo Ventilator (ASV) in patients with heart failure and sleep disorder breathing, in particular on echocardiographic parameters.

Methods: Ambulatory patients with congestive heart failure were screened for



presence of Sleep Disorder Breathing (SDB). After a full night polysomnography the patients were divided in OSA, CSA-CSR or noSDB. All patients with SDB were titrated at the begin by CPAP but if CSA-CSR occurred or was not resolved they were switch to ASV.

All patients were evaluated at baseline and after six month of treatment by echocardiographic study and clinical evaluation.

Results: 52 patient were enrolled, age was 63,2*m*10,06, FE 31,2*m*8. Of them 13 patient (25%) were no SDB,21 were OSAS (40%) 18 were CSA-CSR (35%). There was not differences among groups according to age, FE, TAPSE and NT-proBNP. All patients with SDB were admitted to nocturnal ventilation: 14 received CPAP, 16 received ASV while 9 refused treatment. After 6 months, any change was obtained in FE and NT-pro-BNP and in TAPSE, as well as on the other echocardiographics parameters in all groups.

Conclusion: In patients with CHF sleep disorder breathing are very common, however CPAP o ASV nocturnal ventilation have no impact on improvement of echocardiographics parameters.

P893

Central sleep apnea. CPAP or adaptive servoventilation (ASV)?

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Objectives: Describe clinical and polysomnographic characteristics in patients with CSA that require treatment with ASV in our center.

Material and methods: Descriptive study of 26 patients diagnosed of CSA who were admitted in our Multidisciplinary Sleep Unit MDSU at Fundación Jiménez Díaz-Madrid from May 2009 to November 2011. All patients were treated with CPAP and had gone through a manual titration PSG at 1 or 3 months after diagnosis. We detected poor control and switched to ASV.

Results: Included 26 males patients CSA (age of 61 years and mean BMI of 32.5). CV risk factors:73% ex-smokers,73% HAP 50% lipid alterations,31% ischemic cardiopathy, 23% had previous HF, 27% arrhythmias, 25% DM, 7% opioid use, 7% chronic renal disease. The classic OSAS triad was the most frequent symptomatology, average Epworth 11,8 0%. PSG results: average AHI 67/h,CAI 38.4/h, HI 22.6/h, AHI REM 43.2/h. CPAP titration PSG showed a high persisting AHI (average 40.4/h) with predominance of central events (average 23.7/h apnea and 15.1/h hypopnea). ASV was administrated with 2 types of equipment: BIPAP autoSVAor CS2.ASV titration PSG showed a statistically significant decrease in respiratory events with a residual average AHI of 11.3/h (p 0.001), CAI of 0.5/h (p 0.002) and HI of 9/h (p 0.02). The average time of therapeutic compliance was of 6.1/h/night. It statistically improved Epworth score (average of 7.8) (p 0.001). Conclusions: In our studied HF was not highly prevalent. ASV is an effective therapeutic tool for CSA's and CPAP refractory/resistant compSAS, controlling both apneic events and symptoms. A manual titration PSG is necessary for correct diagnosis and follow-up of these patients.

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Correlation of pulmonary function and sleep disordered breathing parameters in patients with idiopathic pulmonary fibrosis Charalampos Mermigkis, Izolde Bouloukaki, Katerina Antoniou,

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Background: Restrictive pulmonary diseases like Idiopathic Pulmonary Fibrosis (IPF) are characterized by decreased lung volumes that can reduce the upper airway stability and potentially predispose to SDB.

Aims and objectives: Therefore our aim was to correlate pulmonary function testing (PFT) parameters with Apnea-Hypopnea Indices (AHI), overall and during NREM and REM sleep, in newly diagnosed IPF patients.

Methods: Twenty consequent patients (16 males/4 females, age 68.5 ± 11 yrs) with newly diagnosed IPF were included. All had a formal in lab sleep study as well as PFT's before the initiation of any therapy for IPF.

Results: Twelve patients had an AHI above 5 per hour of sleep indicating underlying SDB. A statistical significant trend was observed between RV and RV/TLC values and REM AHI (p=0.07, r=-0.44 and p=0.08, r=-0.43 respectively). No statistical significant correlations were observed between the other PFT parameters (FEV1%, FVC%, FEV1/FVC, TLC, VC) and AHI indices. DLCO/VA values showed a statistical significant negative correlation with overall AHI (p=0.05, R=-0.50), NREM AHI (p=0.04, r=-0.51) and REM AHI (p=0.05, r=-0.52)

Conclusion: Our results suggest that there is a statistical significant trend between reduced lung volumes and AHI during the vulnerable period of REM sleep. The lack of strong statistical correlations between PFT's and SDB parameters might related to the fact that PFT's routinelly are performed with the patient in the upright and not the supine position.

P895

Prevalence of obstructive airway disease in patients with obstructive sleep apnea

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Introduction: Obstructive airway disease (OAD; mainly chronic obstructive pulmonary disease and asthma) and obstructive sleep apnea (OSA) are common diseases, but data on prevalence of OAD in OSA are scarce. We aimed to assess the prevalence of OAD in patients with OSA.

Methods: Medical records of all patients who underwent diagnostic polysomnography in University Clinic Golnik from 2005 to 2010 were retrospectively reviewed. Only patients with available pulmonary function tests were included (89% of all). Patients were divided in two groups: controls (apnea-hypopnea index - AHI < 5) and OSA patients. OAD was defined as FEV1/FVC<70%.

Results: Out of 865 patients 718 (83%) had OSA (80.5% men, age 53.2±10.4y, BMI 34.3±6.8, AHI 41.8±24.9) and 147 (17%) were controls (69.4% men, age 50.5±12.3y, BMI 30.2±6.7, AHI 2.4±1.7). Prevalence of OAD was 141 (19.6%) in OSA and 27 (18.4%) in controls, p=0.723. In those with OAD, OAD was first diagnosed in sleep laboratory in 83 (58.9%) of OSA patients and in 8 (29.7%) of controls, p=0.005. There was no difference between groups regarding FEV1/FVC (64.1±7.4% vs. 62.5±6.7%, p=0.293) and FEV1% predicted (75.8±20.1% vs. 72.9±19.4%, p=0.485). Severe airway obstruction (FEV1<50% predicted) was present in 17 (12.1%) OSA patients and in 3 (11.1%) controls, p=0.890. In multivariate logistic regression adjusted for age, sex, BMI and chronic heart failure (CHF), age (OR 1.07,CI 1.05-1.09), male gender (OR 0.47, CI 0.26-0.80), and CHF (OR 2.13, CI 1.14-3.98) predicted OAD in OSA.

Conclusions: OAD was common and underdiagnosed in OSA patients, which probably warrants screening for OAD in OSA patients. Higher age, female gender, and CHF predicted OAD in OSA.

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Obstructive sleep apnea is associated with lower level of quality of life in

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Background: Recent data suggested that obstructive sleep apnea (OSA) is an important contributor of severe uncontrolled asthma. This study was aimed to investigate clinical features including asthma control, quality of life and airway inflammation in adult asthmatics with high OSA risk.

Methods: A total of 217 patients with asthma who visited tertiary-care clinic were randomly recruited in this study. They completed Berlin questionnaire validated for screening of OSA risk, asthma control test (ACT), and quality of life questionnaire for adult Korean asthmatics (QLQAKA). Fraction of exhaled nitric oxide (FeNO), lung functions, and blood test for lipid profile were evaluated simultaneously. Body impedance test were also performed for analysis of body composition.

Results: Mean age of study subjects was 58.4 yr and 41.9% were male. Eighty nine subjects (41.0%) were classified as high risk of OSA from Berlin questionnaire. Patients with high OSA risk showed significantly older age, higher prevalence of hypertension, higher BMI, and non-atopic predisposition. High risk OSA group showed lower ACT score than low OSA risk group, but it was not significant. QLQAKA score was significantly lower in the high OSA risk group compared with low OSA risk group. Lung functions and FeNO were not different between groups. Visceral fat area were significantly higher in the high OSA risk group, and significantly correlated with QLQAKA score.

Conclusion: Asthma-related quality of life is significantly decreased in adult asthmatics with high risk of obstructive sleep apnea.

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P897

Nocturnal gastroesophageal reflux, lung function and symptoms of obstructive sleep apnea

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Background: Nocturnal gastroesophageal reflux (nGER) has received increasing interest as a predisposing factor for respiratory diseases and sleep disturbances. The possible role of obstructive sleep apnea (OSA) contributing to nGER is of special interest. The aim of this study was to explore the association between nGER and respiratory diseases, lung function and symptoms of OSA.

Methods: Participants in the Burden of Obstructive Lung Disease (BOLD) initiative in Iceland and Sweden, a random sample from the general population of 1325 adults aged 40+ (>70% response rate), were compared by pre- and postbronchodilator spirometry, answers to questionnaires about OSA and respiratory symptoms, health, and symptoms of GER.

Results: Altogether 102 (7.7%) reported nGER and 249 had used medication against GER. The participants were divided into three groups: 1) No nGER (n=1040), 2) treated GER without nGER (n=183) and 3) nGER (n=102). The nGER group had a significantly higher prevalence of respiratory and OSA symptoms than subjects without nGER. The nGER group also had a higher prevalence of COPD (GOLD stage 1+), (25.0% vs. 15.6%) (p=0.02) and lower FEV1/FVC ratio (95.9% vs. 98.9% of the predicted, p=0.01). These associations remained significant after adjusting for smoking, weight and other possible confounders. No independent association was found between having treated GER and lung function, respiratory or OSA symptoms.

Conclusions: In our cross-sectional epidemiological study, untreated nGER is strongly associated with both respiratory and OSA symptoms as well as airflow obstruction

P898

Increased toll-like receptor 4 expression in mice lung tissue under intermittent hypoxia

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Objective: Obstructive sleep apnea (OSA) is highly prevalent and is associated with increased risk of cardiovascular disease. OSA is characterized by episodic cycles of hypoxia and normoxia during sleep. While OSA is considered as a proinflammatory condition, there is little data on cellular inflammation in OSA. The aim of this study was to examine the expression of lung tissue TLR4 mRNA and protein in mice under intermittent hypoxia condition.

Methods: Eight-week old male C57BL/6J mice were exposed to intermittent hypoxia (30 s exposure to 5% oxygen, followed by 30 s exposure to 21% oxygen) for 8 h/day during daytime or maintained under normoxic conditions for 2, 3, or 4 weeks. The mRNA expression levels of anti-TLR4, anti-nuclear factor-kappa B (NF-кB), anti-inhibitory I kappa B protein (I-кB), anti-transforming growth factor $(TGF{-}\beta)$ and anti- $\beta{-}actin$ antibody in lung tissue were measured by real time reverse-transcription PCR, and protein levels were assayed by Western blot.

Results: Under intermittent hypoxia, the mRNA expression of TLR4 was increased more than that of the control group. There was a positive correlation between the mRNA and protein level of TLR4 in a time-dependent manner, although it was not statistically significant. The expressions of I- κB and TGF- β were increased with the period of intermittent hypoxia.

Conclusions: These results show that TLR4 expression is increased in lung tissue under intermittent hypoxia condition. These data suggest that intermittent hypoxia in OSA can influence TLR4 expression and TLR4-associated pathway may be related with systemic inflammatory response in OSA.