

422. Cardiovascular consequences of obstructive sleep apnoea

P4698

Effect of CPAP on brachial-ankle pulse wave velocity in patients with OSAHS

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Background: Pulse wave velocity (PWV) is a good indicator of arterial stiffness and an important predictor of cardiovascular events. Recent studies have revealed that PWV increases in patients with obstructive sleep apnea-hypopnea syndrome (OSAHS) and it also correlates with its severity. However, the therapeutic effect of continuous positive airway pressure (CPAP) on PWV remains undetermined.

Materials and methods: We started CPAP treatment on 17 moderate to severe OSAHS patients. Brachial-ankle PWV was measured before starting CPAP, and at 2 months and 4 months after the CPAP start. At the same time, daytime sleepiness was evaluated using the Epworth sleepiness scale (ESS), and the serum total cholesterol levels and body weight were measured.

Results: Before the CPAP treatment, mean brachial-ankle PWV of patients was 15.6 ± 0.6 m/s, and mean ESS score was 8.6 ± 1.0 . Brachial-ankle PWV was found to positively correlate with heart rate, systolic blood pressure, diastolic pressure, mean blood pressure, and arousal index. During the study period, the CPAP treatment did not have a significant effect on heart rate, blood pressures and serum total cholesterol levels. However, it significantly improved ESS score at 4 months after the CPAP start ($p = 0.001$) while it decreased brachial-ankle PWV at 2 months and at 4 months after the CPAP start ($p = 0.010$ and $p < 0.001$, respectively).

Conclusions: The CPAP treatment was shown to decrease brachial-ankle PWV without affecting blood pressures in OSAHS patients. Although the precise mechanism for this effect is unclear, our finding suggests a close relationship between OSAHS and arterial stiffness, while also reemphasizing the clinical importance of CPAP treatment.

P4699

Arterial compliance in obstructive sleep apnoea – a pilot study

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Introduction: Obstructive sleep apnoea (OSA) is associated with hypertension and increased risk of stroke. Reduced arterial compliance is a feature of both hypertension and cerebrovascular disease. The aim of this study was to compare arterial compliance in untreated OSA patients with control participants. We also examined the effect of continuous positive airways pressure (CPAP) on arterial compliance.

Method: OSA patients were recruited from the sleep clinic. Patients were diagnosed with OSA on the basis of clinical history, Epworth score and a positive sleep study. Patients with normal sleep studies were recruited as controls. Arterial compliance was measured by applanation tonometry. Low arterial compliance is represented by a high augmentation index (AI). In OSA patients AI was repeated 3 months after starting CPAP. Patients with risk factors for cardiovascular disease were excluded. The study was approved by the Grampian research ethics committee.

Results: AI in patients with OSA did not differ significantly from controls [median (IQR): 16.5 (10.5-25) vs. 19 (10.5-26.5), $p=0.75$], although patients with OSA had higher diastolic blood pressure at baseline than controls [median: 90 (85-96) vs. 76 (73-81), $p=0.001$]. After 3 months of treatment with CPAP there was a small but significant fall in AI [15.5 (10-25.5) vs. 13.0 (10.5-19), $p=0.015$]. There was also a significant fall in diastolic BP post CPAP [90 (86-95) vs. 84 (79-88), $p=0.0006$].

Conclusion: We found no significant difference in AI between OSA patients and controls, although the AI did fall in OSA patients following CPAP treatment. This suggests that increased arterial compliance could be a mechanism by which CPAP reduces risk of stroke in OSA patients.

P4700

Assessment of aortic stiffness which is a new cardiovascular morbidity and mortality predictor in patients with obstructive sleep apnea syndrome and relation with severity of the disease

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Obstructive sleep apnea syndrome (OSAS) inversely affects the cardiovascular system via different several pathogenic mechanisms. Mainly, sympathetic system activation and endothelial dysfunction were usually seen in these patients. In the present study, aortic stiffness and its relation with OSAS severity was assessed in

OSAS patients. Recently, it was shown that impaired aortic stiffness are related to various cardiovascular diseases.

We studied 45 patients with OSAS (apnea-hypopnea index: AHI > 5) who were free of cardiac diseases. We compared aortic strain and aortic distensibility levels of OSAS patients with the level of 25 control subjects (AHI < 5) who were matched for age and body mass index. The presence and severity of sleep apnea were determined by standard overnight polysomnography. Aortic strain and distensibility were calculated from pulsatile aortic diameter changes and blood pressure values. Aortic strain (7.2 ± 2.4 , 11.8 ± 2.1 , %, $p=0.001$) and aortic distensibility (3.4 ± 1.6 , 5.8 ± 1.7 , 10^{-6} cm² dyn⁻¹, $p=0.002$) were significantly lower in patients with OSAS than in controls. There were significant negative correlation between aortic strain-distensibility parameters and AHI ($r=-0.48$, $p=0.001$ and $r=-0.41$, $p=0.01$). In conclusion, decreased aortic stiffness parameters in OSAS patients according to severity of disease, is a new markers of elevated cardiovascular risk in these patients.

P4701

Influence of continuous positive airway pressure therapy on endothelial function and blood pressure in patients with arterial hypertension and obstructive sleep apnoe syndrome

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Objective: Function assessment of endothelium by endothelial-dependent response of the brachial artery in hypertensive patients (pts) with obstructive sleep apnoe (OSA).

Design and methods: The study sample consisted of 45 pts. They were divided into 2 groups consisted of 30 pts (1gr) with previously diagnosed moderate/severe hypertension (SBP₂₄=167±9; DBP₂₄=111±12) and of 15 pts (2gr) controls. 15 pts from 1gr had moderate/severe obstructive sleep apnoe (AHI=47.5±2.2). Continuous positive airway pressure therapy (CPAP) was administered to 7 pts for 12 weeks. The participants were matched for age, weight. The brachial artery diameter was measured during the rest and on 90 reactive hyperemia.

Results: Flow-dependent vasodilatation (FDVD), measured in brachial artery in 1gr ($m=6.65 \pm 3.0\%$) was significantly lower than in healthy controls ($m=11.6 \pm 3.1\%$) ($p<0.001$). In 15 pts from 1gr with moderate/severe OSA FDVD ($m=4.93 \pm 2.42\%$) was also significantly lower than in corresponding controls ($p<0.001$) and was lower than in hypertensive pts ($n=15$) without OSA ($m=7.02 \pm 2.77\%$, $p<0.05$).

After 12 weeks CPAP-therapy we have found a tendency to increasing FDVD from ($m=5.02 \pm 2.14\%$) to ($m=5.58 \pm 2.75\%$) ($p=0.06$).

After 12 weeks CPAP-therapy we have also found a tendency to decrease DBP(night) from ($m=111 \pm 12$) to ($m=107 \pm 8$) ($p=0.06$).

Conclusions: Endothelial function is more attenuated in hypertensive pts with OSA, than in hypertensive pts without OSA. Thus, the higher risk of cardiovascular events in hypertensive pts with OSA could be explained.

CPAP-therapy improves FDVD and diurnal index DBP(night) in pts with hypertension and OSA.

P4702

Sleep apnea and endothelial dysfunction

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We investigated the association between sleep apnea and endothelial dysfunction as reflected by the flow mediated vasodilatation (FMD) measured by the change of brachial artery diameter after a 4 minute period of forearm ischemia. The pulse wave velocity over the forearm between 30 patients (mean age 48 ± 6.8 yrs) with obstructive sleep apnea (OSA) (hypopnea – apnea index, HAI mean 46 ± 12.5) was compared with that of 30 healthy subjects matched for age, sex and body mass index. The pulse wave velocity is inversely related to the square root of arterial distensibility. Patients with OSA had lower FMD compared to controls (4.3 ± 1.2 vs. $9.7 \pm 1.5\%$, $p < 0.001$). Multiple regression analysis identified hypopnea-apnea index as the only significant factor of reduced flow mediated vasodilatation (FMD). Patients with OSA were randomized to nasal continuous positive airway pressure (nCPAP) or observation for 12 weeks. Patients on nCPAP had a significant increase in FMD, whereas those in observation had no change (6.5% vs 0.7% , $p < 0.001$). These findings demonstrate that patients with moderate/severe OSA have endothelial dysfunction and treatment with nCPAP could reverse the dysfunction. Endothelial dysfunction is one of the pathophysiologic mechanisms in sleep apnea associated with cardiovascular morbidity and mortality.

P4703

Prevalence of cardiovascular risk factors and coronary artery disease in patients with obstructive sleep apnea syndrome (OSAS) requiring CPAP treatment

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In cohort studies evaluating cardiovascular risk in patients with OSAS the pro-

portion of patients treated with continuous positive airway pressure (CPAP) is relatively small.

Methods and patients: we have performed a prospective study in 10 homecare associations of the french ANTADIR federation to evaluate the prevalence of classical cardiovascular risk factors and coronary artery disease in patients with OSAS requiring CPAP. An auto-questionnaire was filled-in by the patient at the time of CPAP installation. 905 patients (mean age 59 yrs; 75% male) were included over 12 months. The apnea-hypopnea index (AHI) was 5-29/hr in 14%, 30-49/hr in 45%, and ≥ 50 /hr in 41% of cases.

Results: The prevalence of hypertension was 59%, diabetes 24%, hyperlipidemia 37%, smoking 66%, family history of ischemic heart disease 22% and obesity (body mass index or BMI $>30 \text{ kg/m}^2$) 66%. The mean number of cardiovascular risk factors per patient was 2.7. Hypertension and diabetes were associated with increased age, BMI and nocturnal oxygen desaturation indices.

Coronary artery disease had a prevalence of 18%, and was associated with increased age, lower AHI and higher prevalence of hypertension, diabetes, hyperlipidemia and family history of ischemic heart disease. Smoking habits, BMI and nocturnal oxygen desaturation indices did not differ between coronary and non-coronary patients.

Conclusion: the prevalence of cardiovascular risk factors and coronary artery disease is very high in OSAS patients requiring CPAP. The prevalence of coronary artery disease is not associated with a more severe OSAS.

P4704

Morphological ECG changes detected by 12-channel in patients with obstructive sleep apnea

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Cyclical variability of heart rate has been used for the early recognition of obstructive sleep apnea. Previous studies could show that advanced methods to analyze heart rate variability can detect sleep apnea with a high degree of confidence. Some studies did show that the investigation of ECG morphology such as R-wave amplitude enhances the sensitivity and specificity when detecting sleep apnea.

Methods. We investigated 95 consecutive patients with obstructive sleep apnea with cardiorespiratory polysomnography and a parallel diagnostic 12-channel ECG. The ECG system could record 12 channels. ECG analysis provided 250 ECG parameters per heart beat of which only five parameters were chosen: heart rate, normalized R-wave amplitude, QRS-wave amplitude, area under the QRS wave, and QRS vector angle.

Results. For 56 patients valid ECG and parallel recordings were obtained. The five parameters did show periodic variations in parallel with apnea and hypopnea events as detected by the polysomnography. Fast Fourier analysis was applied to the five signals and a threshold was applied in order to distinguish minutes with and without disordered breathing. These minutes were correlated with the total number of apnea. For heart rate the comparison resulted in a correlation of $r=0.64$ ($p<0.01$) and for the area under the QRS wave correlation was $r=0.61$ ($p<0.01$). During sleep apnea not only heart rate shows characteristic changes with obstructive sleep apnea but also the ECG waveform changes too. The ECG waveform changes persist in patients with autonomic dysfunction and possibly in central sleep apnea. The waveform changes may be attributed to intrathoracic pressure changes during obstructive sleep apnea.

P4705

Relationship between severity of chronic heart failure (CHF) and sleep related breathing disorders (SRBD)

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Objective: 1. To evaluate if the severity of CHF influences the type of SRBD. 2. To detect the impact of SRBD on daytime sleepiness, measured with the Functional Outcome Sleep Questionnaire - FOSQ.

Methodology: We have included patients with CHF (left ventricular ejection fraction: LVEF $\leq 45\%$). All of them carried out a FOSQ, an echocardiography and a respiratory polygraphy (RP). Patients were divided in two groups: Group I: LVEF $\leq 35\%$. Group 2: LVEF $\geq 35\%$. In each group we have determined the frequency of SRBD, defined as an apnea-hypopnea index AHI ≥ 10 in the RP, as well as the type of SRBD, defining a central sleep apnea (CSA) when central apneas represented at least 70% of the total number of respiratory events. Moreover it has been analyzed if there were differences in FOSQ between both groups.

Results: We include 92 men and 12 women, with a mean LVEF of 30.8 ± 9.4 ; of them, 42 patient (40.4%) presented a SRBD (21 OSA-obstructive sleep apnea and 21 CSA). The percentage of SRBD in each group of patients is shown in

Percentage of SRBD

	Group 1 (n=60)	Group 2 (N = 44)	p
SRBD	28 (46.6%)	14 (31.8%)	< 0.05
CSA	17 (28.3%)	4 (9.09%)	0.001
OSA	11 (18.3%)	10 (22.7%)	N.S.

the table. There were not significant differences in the mean value of the FOSQ between both groups of patients.

Conclusions: 1. The frequency of SRBD is significantly greater in the group of patients with CHF more severe, due to a greater frequency of patients with CSA. 2. The frequency of OSA is not related with the severity of CHF. 3. In spite of the differences in the frequency and type of SRBD depending of the severity of the CHF, there are not differences in the FOSQ.

P4706

Efficient CPAP therapy can improve autonomic nervous system dysfunction in OSA patients

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Background: Sleep apnea can induce severe arrhythmias, including prolonged periods of asystole and heart block, even in the setting of a normal myocardium and cardiac electrophysiologic function. Heart rate variability (HRV) has gained importance in the last years as a technique employed to explore the autonomic nervous system which plays an important role in the pathophysiology of arrhythmogenesis.

Material: To confirm the relation between OSA and ANS dysfunction, we prospectively investigated ANS function in 24 patients (18 males, mean age 53 years) with moderate or severe OSA. Overnight polysomnography before and after nCPAP therapy was accomplished. All patients were treated by nCPAP. We analyzed AHI, desaturation index, mean, min arterial oxygen saturation, mean and standard deviation (SD) for HRV triangular index and pNNS50 (percent of difference between adjacent RR intervals that are greater than 50 ms) before and after initiating CPAP treatment.

Results: AHI decreased markedly from 51 to 3 events/h, desaturation index decreased from 45.9 to 3.62 events/h and mean arterial oxygen saturation improved from 92.15% to 94.8%. HRV triangular index decreased from 18.3 to 12.8 as well as pNNS50 in all patients after initiating nCPAP therapy, suggesting that efficient CPAP therapy may restore autonomic defects, characteristic of severe and moderate OSA, as proven in previous studies.

Conclusions: Abnormalities in cardiovascular variability may be implicated in the subsequent development of cardiovascular disease in patients with OSA. These results suggest that impaired ANS function is present in patients with OSA as resulted from previous studies and can be improved by successful nCPAP therapy.

P4707

Frequency of obstructive sleep apnea in acute myocardial infarction patients and association with the level of homocystein and nitric oxide

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OSA is associated with cardiovascular morbidity and mortality. Reduced endothelium dependent vasodilatation has been reported in patients with OSA. Deficiency of NO has been implicated in the pathogenesis of cardiovascular disease. Plasma levels of homocystein are also associated with cardiovascular morbidity and mortality. To examine the hypothesis that OSA is associated with cardiovascular morbidity we therefore investigated homocystein and NO in OSA patients with and without ischemic hearth disease (IHD) in comparison with normal subjects and IHD without OSA patients.

Methods: PSG was performed in 27 MI patients that was grouped as single vessel, two vessels, three vessels disease according to their coronary angiography, and 25 patients without evidence of IHD. Levels of hcy and NO were determined after the overnight fasting. Patients were included OSA with IHD (n:12), OSA without IHD (n:14), IHD (n:15), and normal (n:11). Results: %44.4 of IHD patients had OSA. OSA patients with IHD had significantly higher hcy levels (16.9 ± 4.6) than other groups. OSA patients without IHD had lower NO levels than the other groups. ODI and AHI were higher in three vessel disease ($p: 0.006, p: 0.024$) NO were correlated with the time of oxygen saturation <90 ($r: -0.35, p: 0.012$) Conclusion: These results may be explained by endothelial dysfunction combined with excess free radical formation and oxidative stress in OSA.

P4708

The relationship between autonomic modulation of heart rate variability and sleep breathing disorders in patient with chronic heart failure

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The aim of the study was to evaluate relationship autonomic modulation of heart rate variability (HRV) and sleep breathing disorders in patients (pts) with chronic heart failure (CHF) on the optimal treatment. 22 consecutive pts (mean age 54.64 ± 13.60 , 20 male, 2 female) with CHF (57% ischemic cardiomyopathy,

43% dilated cardiomyopathy), mean NYHA class: 2.1 ± 0.6 , Epworth Sleepiness score: 5.9 ± 4.64 and BMI: 26.22 ± 4.32 , were investigated. Ambulatory overnight cardiorespiratory polygraphy with quantification apnea-hypopnea index (AHI), time of desaturation expressed as the percent of recording time with $\text{SaO}_2 < 90\%$, minimal, maximal and average heart rate and autonomic micro-arousal (AMA) by puls transit time (PTT) were determined by HypnoPTT. Short-term recording (5 minutes) time domain and frequency domain HRV indices were determined.

Results: OSA/CSA was present in 20/22 (90%) patients according to an $\text{AHI} \geq 15/\text{h}$. There were no significant correlation between AHI (mean 25.1 ± 13.28) and EF (mean $32 \pm 9.15\%$). There were no significant trend towards the AHI increment with progression of NYHA class. CSA was present in 20 (90%) pts. Frequency of CSA significantly increased with progression of NYHA (2.42 ± 1.56 vs. 7.50 ± 4.61 vs. 7.76 ± 5.71 ; NYHA I vs. NYHA II vs. NYHA III/IV). Statistically significant correlation was found between HRV indices LF/HF (3.53 ± 2.92) and respiratory AMA ($15.82 \pm 8.88/\text{h}$).

Conclusions: statistically significant correlation between respiratory AMA and LF/HF could indicate sympathetic modulation connected to the respiratory events. It seems that the number of CSA events is underestimated by HypnoScan automatic analysis software.

P4709

Effects of CPAP on right ventricular myocardial performance index in obstructive sleep apnea patients without hypertension

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Obstructive sleep apnea (OSA) might cause right ventricular dysfunction and pulmonary hypertension. We aimed to determine the effects of nasal continuous positive airway pressure (CPAP) therapy on right ventricular myocardial performance index (MPI) in OSA patients without hypertension. 49 subjects without hypertension, diabetes mellitus, any cardiac and pulmonary disease had overnight sleep study and echocardiography. In 18 moderate-severe OSA (apnea-hypopnea index ≥ 15) patients, right ventricular free wall diameter (RVFWD) was measured by M-mode, and right ventricular MPI was calculated as (isovolumic contraction time + isovolumic relaxation time) / pulmonary ejection time using Doppler at baseline and after 6 months CPAP therapy. Mean age was 46.5 ± 4.9 year. Patients had high body mass index (BMI: 30.6 ± 4.0 kg/m²), but there was no change in either BMI or blood pressures after 6 months. Right ventricular end-diastolic and end-systolic diameters were in normal limits at baseline, and did not change after CPAP usage. Baseline RVFWD (7.1 ± 2.1 mm) significantly decreased after CPAP therapy (6.2 ± 1.7 mm, $p < 0.001$). 15 of patients (83%) had right ventricular diastolic dysfunction at baseline, and it was completely improved in 11 of them (73%) by CPAP usage. Right ventricular global dysfunction was shown in 11 patients (61%) with a high MPI ($62.2 \pm 9.3\%$) at baseline; and MPI was significantly decreased after CPAP therapy ($47.3 \pm 8.4\%$, $p < 0.0001$), and it was completely corrected in 4 of them (36%). CPAP therapy significantly decreases RVFWD and improves right ventricular diastolic and global dysfunctions (MPI) in OSA patients without hypertension.

P4710

Left ventricular diastolic dysfunction and nocturnal oxyhaemoglobin desaturation in hypertensive patients

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Aim of our research was to evaluate the relationship between nocturnal oxyhaemoglobin desaturation and left ventricular (LV) diastolic dysfunction in hypertensive patients.

Methods Our study enrolled 40 patients (32 male, 50.9 years), with mild essential hypertension. Patients with any other heart disease, pulmonary disturbances or abnormal blood gas tension were excluded.

Conventional echocardiography was used. Left atrium (LA) volume, velocity of early and late diastolic LV filling (E, A), E/A ratio, deceleration E time (DTE) isovolumic relaxation time (IVRT) from transmitral Doppler and velocity propagation (Vp) from Color M mode were measured. All patients had impaired LV relaxation ($\text{E}/\text{A} < 1$) and LV ejection fraction $> 50\%$.

Nocturnal oxyhaemoglobin saturation (SpO_2) was obtained by finger pulse oximetry. Oxyhaemoglobin desaturation $> 3\%$, and oxyhaemoglobin desaturation index (ODI) $\geq 5/\text{h}$ were considered significant. All patients were divided into two groups (group ODI $\geq 5/\text{h}$ and group ODI $< 5/\text{h}$).

Results Demographic characteristics including other risk factors were similar in both groups. Patients from group ODI $\geq 5/\text{h}$ had significantly larger LA volume (55.26 ± 12.09 vs. 45.15 ± 10.77 ml, $p = 0.014$) and longer DTE (289.36 ± 20.16 ms vs. 239.60 ± 42.87 ms, $p = 0.002$). Prolongation of IVRT (116.09 ± 7.62 ms vs. 103.17 ± 18.81 ms, $p = 0.034$) and Vp (56.94 ± 13.9 cm/s vs. 38.28 ± 12.34 cm/s, $p = 0.000$) were significantly higher in group ODI $\geq 5/\text{h}$ comparing to group ODI $< 5/\text{h}$. DTE

correlated strongly with ODI ($r = 0.460$, $p = 0.003$), as well as DTE with minimal SpO_2 ($r = -0.309$, $p = 0.049$).

Conclusions LV diastolic dysfunction in hypertensive patients is significantly associated with nocturnal oxyhaemoglobin desaturation.

P4711

Effects of CPAP on blood pressures and left ventricular structure in male patients with obstructive sleep apnea

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Obstructive sleep apnea (OSA) is now recognized as an independent risk factor for hypertension, and contributes to the development of left ventricular hypertrophy which is a major independent risk factor for morbidity and mortality. We aimed to determine the effects of nasal continuous positive airway pressure (CPAP) therapy on blood pressures (BP) and left ventricular structure in male patients with severe OSA.

Methods: Sixty seven subjects without any cardiac or pulmonary disease had sleep study, and echocardiography. Systolic and diastolic BPs were measured consecutively in the sitting position on the right arm using a sphygmomanometer. In 33 males with severe OSA, thickness of interventricular septum (IVS) and posterior wall (LVPW) were measured by M-mode.

Results: The 8 males who were non-compliant with CPAP were excluded. Mean age was 47.9 ± 8.2 year, and 20 of 25 patients (80%) were hypertensive. Patients had high body mass index (BMI: 31.0 ± 3.9 kg/m²), but there was no change from baseline after 6 months. Systolic (145.7 ± 14.1 mmHg) and diastolic (93.8 ± 9.6 mmHg) BPs of the patients significantly decreased (136.1 ± 10.3 mmHg, $p < 0.001$ and 87.2 ± 7.8 mmHg, $p < 0.001$ respectively) and also thickness of IVS (11.0 ± 1.1 mm) and LVPW (11.0 ± 1.0 mm) at baseline were significantly decreased (10.5 ± 0.9 mm, $p < 0.001$ and 10.4 ± 0.7 mm, $p < 0.0001$, respectively) after 6 months CPAP therapy.

Conclusions: In male patients with severe OSA, CPAP therapy significantly decreases systolic and diastolic BPs and left ventricular wall thickness with even if 6 months usage.

P4712

Short-term effect on nCPAP on left ventricular diastolic filling in patients with obstructive sleep apnea

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Background: Factors implicated in the development of cardiac dysfunction in obstructive sleep apnea (OSA) include increased afterload, hypoxia and sympathetic activation during repeated apnea-hyperventilation cycles. Acute reduction of these factors with nCPAP may produce an early beneficial effect on cardiac function.

Objective: To assess the short-term effect of nasal continuous positive airway pressure (nCPAP) treatment on left ventricular diastolic function in patients with severe OSA.

Methods: We evaluated 10 males with severe symptomatic OSA (mean apnea-hypopnea index 79 ± 20) and normal systolic function in the left ventricle. Echocardiographic assessment of mitral inflow (E and A peak velocities, E/A ratio and deceleration time of E wave- DTE) and isovolumic relaxation time (IVRT) were performed prior to, 2 days and 2 weeks following initiation of CPAP.

Results: E/A ratio increased significantly after 2 days and 2 weeks of nCPAP compared to baseline (1.15 and 1.28 vs 0.91, $p < 0.05$). This effect was due to an increase in peak E velocity (0.68 and 0.76 vs 0.58 m/s, $p < 0.05$) while no significant decrease in peak A velocity was noted. IVRT shortened significantly at 2 weeks (0.098s vs 0.114s) and heart rate decreased at 2 days comparing to baseline (65.9 vs 71.1 bpm, $p < 0.05$). There was no significant change in DTE and blood pressure.

Conclusion: Treatment with nCPAP produces early improvement in left ventricular diastolic filling in patients with severe symptomatic OSA.

P4713

The values of systolic mitral annular motion and annular tissue doppler for evaluation left ventricular systolic function in patients with obstructive sleep apnea syndrome

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Obstructive sleep apnea syndrome (OSAS) is associated with cardiovascular morbidity and mortality. For this reason, we investigated the systolic mitral annular motion (SMAM) and mitral annular tissue doppler systolic velocities (MATDSV) in OSAS patients for detecting subclinical left ventricular systolic dysfunction. 78 subjects were examined with polysomnography and classified according to their apnea-hypopnea index (AHI). 48 patients with $\text{AHI} > 5$ were considered as OSAS and 29 subjects with $\text{AHI} < 5$ were included into control group. SMAM-septal,

WEDNESDAY, SEPTEMBER 6TH 2006

SMAM-lateral, MATDSV-septal and MATDSV-lateral parameters were measured by echocardiography

There were no differences between two groups in ejection fraction (74 ± 8.4 , 70 ± 8.1 $p=0.17$), fractional shortening (74 ± 8.4 , 70 ± 8.1 $p=0.17$) and MATDSV-septal (8.1 ± 1.6 , 8.6 ± 1.3 , mm/s, $p=0.13$) measurements. SMAM-septal (13.5 ± 1.5 , 15.2 ± 1.5 , mm, $p=0.001$), SMAM-lateral (16.5 ± 2.2 , 17.6 ± 1.7 , mm, $p=0.04$), and MATDSV-lateral (9.1 ± 2.2 , 10.3 ± 1.6 , mm/s, $p=0.014$) values are significant decreased in patient group compared to the control group. In patient group, there were significant negative correlations between AHI and SMAM-septal ($r=-0.46$, $p=0.002$), SMAM-lateral ($r=-0.28$, $p=0.013$), MATDSV-septal and MATDSV-lateral ($r=-0.24$, $p=0.03$) however there was no correlation with MATDSV-septal value.

In conclusion; left ventricular long-axis function parameters (SMAM-septal, SMAM-lateral, and MATDSV-lateral) which were measured from mitral annulus are useful methods for identifying the cardiovascular morbidity in patients with OSAS.

P4715**Impact of CPAP-therapy on cardiac structure and function in patients with obstructive sleep apnea syndrome and coprevalent arterial hypertension**

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Background: 30 percent of patients with arterial hypertension (AH) are supposed to have a coprevalent obstructive sleep apnea syndrome (OSAS). Hence, we investigated the influence of CPAP- (continuous positive airway pressure) therapy on cardiac structure and function in medically treated patients with AH and coprevalent OSAS.

Patients and Methods: OSAS was diagnosed polysomnographically (Apnea-hypopnea-index > 10/h) and AH was treated for at least 5 years in all patients. Matched-pairs concerning anthropometric data, medical therapy and duration of AH, and severity of OSAS were investigated: 20 patients with untreated OSAS were compared to 20 patients with CPAP-therapy for at least 6 months. Further cardiopulmonary diseases were excluded. Cardiac structure and function were assessed echocardiographically.

Results: Patients under CPAP-therapy had significantly better diastolic left-ventricular function, a lower left-ventricular mass-index, and significantly less frequent signs of left-ventricular (eccentric) hypertrophy than patients with untreated OSAS. Furthermore, differences were significant concerning right-ventricular wall-thickness and mean pulmonary artery pressure.

Conclusions: CPAP-therapy positively influences left- and right cardiac structure and function in addition to antihypertensive medication in patients with AH and coprevalent OSAS.

P4716**Relationship between obstructive sleep apnea syndrome (OSAS) and obesity, cholesterol disorders, blood pressure, and anatomical alterations**

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Introduction: The OSAS has been presenting intimate relationship with obesity, cholesterol disorders, blood pressure elevation and oral cavity anatomical alterations.

Objective: To verify the correlation between the Apnea/Hypopnea Index (AHI) and those specific alterations - obesity, cholesterol disorders, blood pressure and anatomy from a sample of the population of the south area of São Paulo City.

Design: Retrospective clinical study.

Methods: Evaluated 29 patients between January and December of 2005 through a multidiscipline team. The data were collected in the first consultation. The AHI by polysomnography was correlated with triglycerides (TG), total cholesterol (TC) and their fractions (HDL-C, LDL-C), Body Mass Index (BMI), systolic and diastolic blood pressure and anatomical evaluation. The Pearson's Correlation was used for parametric data analysis and Chi-Square for non-parametric data analysis ($p<0.05$).

Results: We found poor correlation between AHI and TG ($r=0.454$ $p=0.03$). There was not any correlation between AHI and other variables. The OSAS classification by AHI levels presented good correlation with Mallampatti Test ($p=0.024$). There was not any correlation between OSAS classification and other anatomical alterations.

Conclusion: High levels of Apnea/Hypopnea Index can suggest the presence of high levels triglycerides in the blood. The Mallampatti Test can aid the stratification of gravity of OSAS.

P4717**Treatment of obstructive sleep apnea improves cardiovascular outcome.****A prospective study**

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Introduction: Obstructive sleep apnea (OSA), a manifestation of sleep related breathing disorders (SRBD) has often been linked to increased cardiovascular risk but the impact of mild forms of SRBD and of OSA-treatment on cardiovascular outcome is discussed controversially. We performed a prospective study to investigate cardiovascular outcome in patients with SRBD.

Methods: Consecutive sleep laboratory patients were included and cardiovascular risk factors and comorbidities were recorded in all subjects. Endpoints were non-fatal (myocardial infarction, stroke, acute coronary syndrome requiring revascularization procedures) and fatal (death from myocardial infarction or stroke) events.

Results: 638 patients were enrolled (age 55.7 ± 10.3 yrs., BMI 30.7 ± 5.3 kg/m²). Median follow up was 90.6 months. 499 patients received treatment (mostly CPAP), 139 patients remained untreated. Mean apnea/hypopnea-index was 22.6 ± 22.7 in treated and 11.1 ± 3.9 in untreated patients, but there were no significant differences regarding cardiovascular comorbidities and risk factors. Events were more frequent in untreated vs. treated patients (estimated 10y-event-free survival: 54.2% vs. 78.5% , log rank test: $p<0.001$). After adjustment for age, gender, cardiovascular risk factors, and comorbidities OSA-treatment was an independent predictor (hazard ratio: 0.439 , 95%CI: $0.291-0.663$, $p<0.001$). This pattern was shown in all degrees of SRBD, in patients ≥ 55 yrs. and <55 yrs., and in patients without pre-existing cardiovascular disease as well.

Conclusion: OSA-treatment is associated with a cardiovascular risk reduction of at least 44% independent from age, degree of SRBD, and pre-existing cardiovascular comorbidities.