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260. Obstructive sleep apnoea: clinical aspects I

P2263**Investigating for dyslipidemia in those being referred for suspected obstructive sleep apnoea**Sinead Walsh, Faheem Khan, Danielle Divilly, J.J. Gilmartin. *Regional Respiratory Centre, Merlin Park Hospital, Galway, Ireland*

Introduction: Abnormal lipid metabolism is a major risk factor in the development of coronary artery disease. Dyslipidemia is present in many subjects with Obstructive Sleep Apnoea Syndrome (OSAS) and an independent association between the two has been observed in a number of studies. Patients referred for inpatient polysomnography in our unit are screened by a fasting lipid profile. This study aims to evaluate the rates of dyslipidemia in this population and to compare OSAS and non-OSAS populations.

Methods: A retrospective review of 285 consecutive subjects (78.6% male, 21.4% female) referred for sleep assessment was performed. Laboratory results, polysomnographs and charts were analysed.

Results: 89 out of the 285 subjects (31.2%) were on a statin and were excluded from further analysis. Of the 196 not on a statin, all had a fasting lipid profile performed. 156 (79.6%) had a positive sleep study, while 40 (20.4%) were negative for OSAS.

	OSAS	No OSAS	p-value
Age	49.2	49.1	0.960
BMI	37.9	30.8	<0.001
AHI	40.55	3.33	<0.001
Total Cholesterol	5.15	5.17	0.890
Triglycerides	1.86	1.57	0.090
LDL cholesterol	3.25	2.99	0.064
HDL cholesterol	1.03	1.39	<0.001

Conclusion: OSA patients have lower HDL cholesterol levels, but no significant difference in total cholesterol, triglycerides or LDL levels. We recommend to continue measuring fasting lipid profiles in this population. A possible confounding factor in our study is BMI.

P2264**Correlation between excessive daytime sleepiness and the risk for obstructive sleep apnea with academic performance among medical students at UP-PGH**Mary Jane Sandagon, Ma. Philina Pablo, Manuel Jorge. *Internal Medicine-Pulmonary Section, University of the Philippines- Philippine General Hospital, Manila, Philippines*

Objective: This study aims to determine if there is any relationship between daytime sleepiness and risks for obstructive sleep apnea (OSA) with students' academic performance.

Methods: A self-administered validated questionnaire (consisting of Profile, Sleeping habits, Berlin Questionnaire, and the Epworth Sleepiness Scale) was distributed to duly enrolled medical students from Level 1 to 6 of the University of the Philippines College of Medicine SY 2009-2010. The general weighted average of every student at the end of the 2nd semester school year 2010 was obtained and correlations were determined.

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Results: There were 458 (64.4%) students who participated in the study out of the 711 duly enrolled medical students for academic year 2009-2010. Of the participants, 77.3% had abnormal daytime sleepiness ranging from mild to excessive. There was poor correlation between levels of daytime sleepiness and academic performance (Pearsons correlation coefficient 2.5). There was also poor correlation between risk for obstructive sleep apnea and academic performance gauged by using grades of students (Pearsons correlation coefficient 0.86).

Conclusion: The present study shows that there is no significant statistical correlation between excessive daytime sleepiness or risk of obstructive sleep apnea and academic performance of medical students as measured by their general weighted average.

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Mortality in young and old subjects with obstructive sleep apnoea with and without comorbidities

Anna Lo Bue¹, Giuseppe Insalaco¹, Adriana Salvaggio¹, Gabriella Dardanoni², Oreste Marrone¹. ¹Institute of Biomedicine and Molecular Immunology, National Research Council, Palermo, Italy; ²Assessorato Sanità Regione Siciliana - Dipartimento Attività Sanitarie, Osservatorio Epidemiologico - Servizio 2 Promozione della Salute, Palermo, Italy

Increasing obstructive sleep apnoea (OSA) severity has been reported to be associated with a progressive increase in mortality excess, particularly among young subjects. It is unclear if in older subjects apnoeas are less harmful than in young subjects, or if comorbidities overcome and obscure the effects of OSA on mortality. Medical records of 1023 subjects studied for suspected OSA between 1991 and 2000 were retrospectively evaluated. During the first months in 2009 their state of survival or possible date of death was enquired. Information about 810 subjects (age 52.4±11.6 years, 629 M) was obtained. In the whole sample, survival was associated to comorbidities and age, but not to AHI or lowest nocturnal SaO₂. Among subjects aged <50 (n=315), 87% did not have comorbidities other than hypertension; in subjects ≥50 (n=495) this percentage decreased to 56% (p<0.001). In the subgroup of the younger subjects without comorbidities (n=273), a lowest nocturnal SaO₂ value <70% was associated to worse survival (96.1% at 10 and 87.6% at 15 years) as compared to values between 70 and 84% (survival respectively 100% and 97%) and values ≥85% (survival 100% at 15 years) (p<0.05). A similar association was not found among older individuals nor among subjects with comorbidities. These data suggest that among subjects ≥50 increasing OSA severity does not worsen mortality even in subjects without comorbidities.

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Relationship between the reduced ventilatory response to CO₂ and the impairment of the lung function in myotonic dystrophy patients

Mathias Poussel¹, Pierre Kaminsky², Julien Laroppe¹, Silvia Varechova¹, Bruno Chenuel¹. ¹Service des Examens de la Fonction Respiratoire et de l'Aptitude à l'Exercice, C.H.U de Nancy, Nancy, France; ²Service de Médecine Interne Orienté vers les Maladies Orphelines et Systémiques, C.H.U de Nancy, Nancy, France

Background and objective: It has already been demonstrated that the ventilatory response to CO₂ is decreased in myotonic dystrophy type 1 (MD1) patients. However, the precise contribution of such impairment of central respiratory drive, associated to respiratory muscle weakness has not been clarified. Therefore, we intended to study the relationship between the reduced ventilatory response to CO₂ and the impairment of the lung function in a sample of MD1 patients.

Methods: 37 MD1 patients were prospectively investigated. Evaluation included measurements of the flow/volume curve and lung volumes, measurements of respiratory muscle function, arterial blood gas analysis and ventilatory response to carbon dioxide (steady state method).

Results: On lung function assessment, 12 MD1 patients presented a ventilatory restriction and 10 patients were hypercapnic. Maximum static respiratory pressures were greatly decreased (33.1% ±15.1 of predicted values) in all but one patient. Ventilatory response to CO₂ was reduced to 0.73 L/min/mmHg ±0.4. Vital capacity decline was correlated to respiratory muscle weakness (p=0.023) but neither to PCO₂ (p=0.274), nor to ventilatory response to CO₂ (p=0.179). Respiratory muscle weakness was not correlated to PCO₂ (p=0.289) nor to ventilatory response to CO₂ (p=0.297).

Conclusion: The reduced response to CO₂ in MD1 patients appeared independent of respiratory muscle weakness and of PCO₂ suggesting a central cause of CO₂ insensitivity. This impairment of the central respiratory command could be involved in central apnoeas and irregular breathing patterns, already observed in such patients.

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Evaluation of association between OSA and metabolic syndrome, insulin resistance and Hs-CRP

Abolhasan Halvani¹, Maryam Salami², Mahmood Karimi³. ¹Pulmonary Medicine, ²Endocrine Medicine, ³Internal Medicine, Shaheed Sadoughi Univ. of Medical Sciences and Health Services, Yazd, Islamic Republic of Iran

Background: Obstructive sleep apnoea (OSA) is an important medical problem that shares many cardiovascular risk factors with metabolic syndrome. This

study aimed to evaluate the possible association of OSA severity with metabolic syndrome, Insulin resistance and Hs-CRP.

Methods: We evaluated 90 subjects who suspected for OSA (54.92 years). Blood sampling was taken after 12 hours fasting for glucose, insulin, high-density lipoprotein (HDL)-cholesterol, triglycerides, high-sensitivity C-reactive protein (Hs-CRP), and then Overnight polysomnography was done. Insulin resistance was assessed by the homeostatic model (HOMA) and metabolic syndrome was evaluated according to The National Cholesterol Education Program's Adult Treatment Panel III report (ATP III), and subjects categorized by OSA severity. We compared three groups: without OSA, mild OSA and moderate to severe OSA.

Results: 28 subjects hadn't OSA, 28 and 34 subjects had mild and moderate to severe OSA, respectively. Metabolic score was 3.29±1.21, 3.07±1.27 and 3.59±1.048 in subjects without OSA and mild OSA and moderate to severe OSA, respectively (r=0.13 p=0.22). HOMA index was 56.87±55.84, 106.42±199.68 and 96.23±127.81 (r=0.33 p=0.37) and hs-CRP levels was 1.62±1.8, 2.10±2.24 and 2.36±2.38 ng/ml (r=0.21 p=0.38) order in above three subjects. There was significant association between metabolic score and HOMA index (p=0.01) and also between metabolic score and hs-CRP level (p=0.02)

Conclusion: Although Hs-CRP, insulin resistance and metabolic syndrome increase with OSA severity but there was not significant association between apnea hypopnea index and Hs-CRP, insulin resistance and metabolic syndrome.

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Oxygen desaturation is associated with diabetes mellitus in patients with obstructive sleep apnoea

Mohammed Al-Abri, Hussain Al-Lawati, Yousef Al-Alawi, Abdullah Al-Manairi. Clinical Physiology, Sultan Qaboos University, Muscat, Oman; Family and Community Medicine, Sultan Qaboos University, Muscat, Oman

Objective: Obstructive sleep apnoea (OSA) is associated with impaired glycaemic control. The aim of the study was to evaluate the contribution of oxygen desaturation in the association of diabetes mellitus (DM) OSA.

Methods: The study was conducted retrospectively between January 2008 and May 2010 in sultan Qaboos University Hospital, department of clinical physiology. The data were collected using electronic medical records and sleep study report. Desaturation index (DI) was calculated by the number of desaturation dips from wakefulness level in addition to SaO₂ <90%.

Results: The total number of cases was 180 (116 males & 64 females) with mean age of 43±17 years. Female patients were more obese than males (BMI= 37.2±10.3 kg/m², 32.7±8.2 kg/m² respectively, P=0.005). The mean apnea/hypopnea index (AHI) was 31±31 and mean Epworth sleepiness scale (ESS) was 11±5. There was significant association between diabetes mellitus (DM) and AHI (median for diabetic 39 Vs 18 for non-diabetic, p=0.03). Furthermore, there was significant association between diabetes and oxygen desaturation index (median for diabetic 25 Vs 9.6 for non diabetic p=0.02) and it becomes more significant with severe desaturation (SaO₂ <90%) (median for diabetic was 50 Vs 4 for non diabetic p=0.002). There was weak association between body mass index and DM (p=0.05) in this population sample. Nevertheless, there was no association between daytime sleepiness (ESS) and the diabetes (p>0.05).

Conclusion: The study showed that Obstructive sleep apnoea is associated with diabetes mellitus. OSA patients with more severe Oxygen desaturation are at greater risk of developing diabetes.

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Systemic inflammation and vascular dysfunction in patients with OSA

Felipe Villar-Ávarez, María Fernanda Troncoso-Acevedo, Germán Peces-Barba, María Soledad Lucero, Ivonne Cabrejos-Salinas, Zahdía Saavedra-Moreno, Nicolás González-Mangado. *Pneumology, Fundación Jiménez Díaz, CIBERES, Madrid, Spain*

Introduction: Our hypothesis is that systemic inflammation and endothelial vascular dysfunction in OSA patients are associated. Therefore our primary objective was to be able to establish the etiological association between them.

Materials and methods: Observational case control study in OSA patients and healthy individuals. All of them were tested for serum and urinary markers. Peripheral arterial tonometry by oscillometric sphygmomanometer (ENDO-PAT 2000) was used to measure endothelial dysfunction and arterial stiffness values (Reactive Hyperemia Index-RHI and Augmentation Index-AI).

Results: This study involved 42 participants (30 with OSA and 12 healthy controls). Mean age: OSA 61.7, controls 50.4 (p =0.02). Mean BMI: OSA 31.8, controls 26.1 (p= 0.01). The OSA severity rate was severe in 54%, low-moderate in 11, 9% and low in 11, 9% of them. The results for the serum and urinary markers (Mann-Whitney test) comparison with median and quartiles were the following: CRP (OSA 0.5 controls 0.3, p=0.15), leucocytes (OSA 7500, controls 6700, p= 0.18), D-dimer (OSA 339, controls 252, p= 0.18), fibrinogen (OSA 401, controls 318, p= 0.0007) and microalbuminuria (OSA 7.6, controls 4.7, p= 0.12). No statistically significant differences in arterial stiffness (IA, OSA 19, controls 13.5 p= 0.3) neither in vascular endothelial dysfunction (IRH, OSA 1.50 control 1.72 p= 0.2) were found, although its value was lower than what is considered significant for endothelial dysfunction (<1.67).

Conclusions: An association between OSA and cardiovascular risk can be established by measuring the inflammatory marker fibrinogen, and by taking into consideration the data that suggest that endothelial dysfunction may be present.

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P2270**The changes of serum adipocytokines levels in patients with OSAHS**

Yong Lin, Ting Xu. *Respiratory Department, Zhongda Hospital of Southeast University, Nanjing, Jiangsu Province, China* *Respiratory Department, Zhongda Hospital of Southeast University, Nanjing, Jiangsu Province, China*

Background: Obstructive sleep apnea hypopnea is associated with obesity. Adipocytokines which were secreted by fatty tissue can influence energy metabolism all over the body and development of obesity. Apelin, NPY and A-FABP were adipocytokines discovered for the past few years. They may participate the generation and development of OSAHS, especially obesity combined OSAHS.

Objective: To investigate the relationship between adipocytokines (Apelin, NPY and A-FABP) and obstructive sleep apnea-hyperpnoea syndrome (OSAHS).

Methods: Patients underwent polysomnography were recruited and divided into OSAHS group and non-OSAHS group. Each group was divided into obesity, hypergravity and normal body weight arms according BMI. OSAHS group was divided into mild, moderate and severe arms. Plasma Apelin, NPY, A-FABP (ng/ml) levels of all arms were tested and compared.

Results: Plasma adipocytokines Apelin, NPY and A-FABP levels were significantly higher in OSAHS group than in the non-OSAHS group of same weight, independent of age and gender. These adipocytokines plasma levels were positively correlated with AHI, BMI, while negatively correlated with L_{SaO₂} and M_{SaO₂} in OSAHS group.

Conclusions: Obesity can cause the increase of plasma Apelin, NPY and A-FABP levels. These three adipocytokines were positively correlated with the severity degree of OSAHS.

P2271**Deregulation of carbohydrate metabolism in patients with sleep apnoea**

Juan Fernández-Lahera, Francisco García Río, Isabel Fernández, Santiago Zudaire, Raquel Casitas, Claudia Llontop, Raul Galera, Carlos Villasante, Rodolfo Álvarez-Sala. *Pneumology, University Hospital la Paz, IdiPAZ, Madrid, Spain*

Material and methods: The study included 103 new patients with the following characteristics: 50±12 years of age, BMI 30.2±5.8 kg/m², neck circumference 42±7 cm, Epworth 11±10, AHI 33±27 h⁻¹, DI 34±28 h⁻¹, mean SpO₂ 91±9% minimum SpO₂ 76±14%, CT 90 22±30%. Diabetic patients were excluded. Patients underwent blood tests and sleep studies.

Results: When comparing a group of patients with OSAS to a control group, there were significant differences in NGSP HbA_{1c} and IFCC HbA_{1c} ($p < 0,037$). There was significant linear correlation between glucose and age ($r = 0,21$). NGSP HbA_{1c} (%) with AHI ($r = 0,35$), minimum SpO₂ ($r = -0,26$), ODI ($r = 0,37$), age ($r = 0,38$). The same for IFCC HbA_{1c}. Insulin with BMI ($r = 0,39$). QUICKI index with AHI ($r = -0,28$), with ODI ($r = -0,30$), with BMI ($r = -0,47$) and with neck circumference ($r = -0,26$). The HOMA-IR index with BMI ($r = 0,40$).

To find possible determinants of NGSP HbA_{1c} (%), the following multiple linear regression model was used: NGSP HbA_{1c} (%) = 4,818 + 0,011 * Age + 0,005 * ODI ($r = 0,23$, $p < 0,003$).

Conclusions: 1) Patients with OSAS show higher levels of NGSP HbA_{1c} and IFCC HbA_{1c}.

2) There were significant correlations between some hydrocarbon metabolism parameters/indices and clinical/sleep parameters.

3) Using the regression model, the NGSP HbA_{1c} variability is explained in 23.3% of cases by age and oxygen desaturation index.

P2272**The relationship between obstructive sleep apnea hypopnea syndrome and insulin resistance, vascular complications in patients with type 2 diabetes mellitus**

Guoxian Ma, Xiheng Guo. *Respiratory and Critical Care Medicine, Beijing Institute of Respiratory Medicine, Beijing Chaoyang Hospital-Affiliate of Capital Medical University, Beijing, China*

Background: The episodes of hypoxia/reoxygenation caused by OSAHS is associated with a series of metabolic changes, and might be involved in the pathogenesis of type 2 diabetes mellitus (T2DM).

Methods: The subjects were poorly controlled type 2 diabetes mellitus from August 2009 to January 2010 in the Endocrine ward of Beijing Chaoyang Hospital. We recorded the clinical information of all subjects. Fasting venous blood samples was obtained after an overnight fast. Polysomnography (PSG) monitoring, oral glucose tolerance test (OGTT), vascular ultrasound were performed in all the subjects.

Results: 96 type 2 diabetic patients were recruited in our study, 78 subjects (81.25%) were diagnosed as having OSAHS after PSG study. The insulin resistance index (HOMA-IR), which was significantly higher in the moderate and severe group versus the control group. Multiple stepwise regression analysis showed that AHI and AUC_{cp} was positively correlated ($R = 0.323$, $p = 0.001$), both AHI and BMI were positively correlated to HOMA-IR ($p = 0.007$ and 0.023 , respectively). The percentage of patients who had atherosclerosis were significant higher in patients with severe and moderate OSAHS than non-apnoeic patients.

Conclusion: OSAHS is positively related to insulin resistance, and closely related to the incidence of macrovascular complications in the patients with type 2 diabetes mellitus.

P2273**Vitamin D deficiency and excessive daytime sleepiness in obstructive sleep apnea: Is there a correlation?**

Markus Blaukovitsch, Stephan Rüller, Ernst Müller, Peter Zabel, Hans-Peter Hauber. *Sleep Disorder Unit, Med. Klinik Borstel, Borstel, Germany*

Aim: In this study we investigated if vitamin D deficiency syndrome is associated with excessive daytime sleepiness (EDS) in patients (pts) who were screened for obstructive sleep apnea (OSA) with polysomnography. Mechanisms accounting for EDS beyond respiratory events may include disturbed sleep quality due to 25-OH-Vitamin D₃ (VD) hypovitaminosis.

Methods: We enrolled 42 pts, who were screened for sleep related breathing disorders. VD serum levels under 30nmol/l were evaluate as hypovitaminosis D. Epworth Sleepiness Score (ESS) and Respiratory Disturbance Index (RDI) were measured in subgroups and compared with levels of VD with Fisher's exact test.

Results: 29 men and 13 women completed the study with a mean age of 62.8 yr. 39 patients had a RDI above normal ($> 5/h$), mean RDI was 25.0, mean level of VD was 34.9. 15 pts had an ESS above 11. 3 of them had a RDI lower than 5 but a mean level of VD of 26.3 nmol/l. Pts with mild OSA (RDI 5-15/h) had significantly higher VD levels (41,6nmol/l, $p = 0.02$) than pts without OSA (26,3 nmol/l) or with moderate (33 nmol/l) to severe OSA (32,8 nmol/l).

Discussion: We found increased VD levels in pts with mild OSA compared to moderate and severe OSA. This could be associated with VD associated non-inflammatory myopathy and an increasing central nervous system homeostatic sleep pressure via effects of decreased levels of VD on TNF-alpha and/or prostaglandin D₂. Our results suggest that pts with EDS and low RDI ($< 5/h$) may suffer from VD hypovitaminosis. More research is needed to determine if pts presenting with EDS and a low RDI should be screened for VD deficiency and if there is a molecular causation between EDS, OSA and low levels of VD.

P2274**Effect of unilateral lingual paralysis on swallowing and breathing coordination**

Yacine Ouahchi, Jean Paul Marie, Eric Verin. *Laboratoire de Chirurgie Expérimentale, Faculté de Médecine et de Pharmacie de Rouen, Rouen, France*

Introduction: The tongue play an important role in swallowing, phonation and respiration. A motor lingual deficit is seen in many neurological disorders. However, its implication on swallowing and breathing coordination remain unknown. The aim of this work was to study the ventilatory pattern during swallowing in rat with unilateral tongue paralysis.

Methods: The study was carried out on 10 wistar rats. Respiratory variables in unrestrained and healthy rats were measured during water swallowing using whole-body plethysmography. This procedure was repeated for all rats before and after unilateral section of hypoglossal nerve (XII). Parameters studied were swallowing frequency and occurrence during inspiration or expiration, tidal volume (VT), total time of ventilatory cycle (TT) and respiratory drive (VT/TT).

Results: A difficulty of leaking was observed in all rats after unilateral hypoglossal nerve section. The main finding was a decrease of respiratory rhythm and ventilatory drive during swallowing after hypoglossal nerve section. Swallowing rate ($17 \pm 5/15$ sec) and occurrence in phases of respiratory cycles did not change.

Conclusion: This study demonstrated that swallowing difficulties and aspiration decrease ventilatory drive during swallowing that can be considered as a mechanism neurologically determined to protect the pulmonary function.

P2275**Oxidative stress in obese children with sleep-disordered breathing**

Kim Van Hooenbeeck¹, Hilde Franckx², Luc Van Gaal¹, Kristine Desager¹, Wilfried De Backer¹, Stijn Verhulst¹. ¹*Experimental Medicine and Pediatrics, University of Antwerp, Antwerp, Belgium;* ²*Obesity Program, Zeepreventorium, De Haan, Belgium*

Background: Sleep-disordered breathing (SDB) is prevalent in obese children. It is an independent risk factor for the metabolic syndrome. Oxidative stress is a possible linking mechanism and is reflected by serum uric acid (UA).

Aim: In this prospective follow-up study we focused on the effects of SDB on oxidative stress in childhood obesity, before and after weight loss treatment.

Methods: Obese children, attending an in-patient weight reduction program, between 10 and 18 years were included consecutively. All subjects had 1 baseline and 1 follow-up visit after 4-6 months of weight loss. UA was measured at both visits. A polygraphy was performed at baseline and repeated in case of oxygen desaturation index (ODI) ≥ 2 at admission.

Results: 132 obese patients participated. Median age was 15.4 years (10.1-18.0). Mean BMI z-score was 2.72 ± 0.42 . SDB was diagnosed in 39%. At baseline, UA concentration correlated negatively with mean nocturnal SaO₂ ($r = -0.29$; $P = 0.001$). There was a positive correlation between UA and ODI ($r = 0.18$; $P = 0.04$). Regression analysis showed a significant relation between UA and ODI, also after adjusting for BMI z-score (partial $r = 0.18$; $P = 0.04$). Median decrease in BMI z-score was 32%. Weight loss treatment was successful in 71% of the subjects with SDB at baseline. UA concentration dropped in all patients. Improvements in UA were associated with improvements in ODI in linear regression analysis, after controlling for decrease in BMI z-score (partial $r = 0.41$; $P = 0.01$).

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Conclusion: There exists a significant association between UA and ODI at baseline, even after controlling for BMI z-score. Changes in ODI after treatment are reflected by changes in UA, independent of the degree of weight loss.

P2276**Cognitive learning function in OSA children**

Silke Weber, Silvana Hilario, Érico Moreira da Silva, Victor Barbosa dos Santos, Cristiane Mendes-Chiloff. *Otorhinolaryngology, Botucatu Medical School State University, Botucatu, São Paulo, Brazil*

Introduction: Obstructive Sleep Apnea (OSA) in children is associated with learning problems, as attention and memory.

Aim: To assess learning, memory and attention function in OSA children.

Methods: OSA children (IAH>4 or IA>1), both genders, aged 6 to 12 years, were submitted to psychological learning test (symbol, digits and code – WISC III Wechsler Intelligence Scale for Children). Test result were pondered for age, 10 points were considered normal, <=8 as suspicious, <= 7 as disturbed learning needing specialized support. WISC results were correlated to age, gender, IAH and desaturation index (IDO). Children with hearing loss, neurologic disease or genetic syndrome were excluded.

Results: 30 children, 9 girls, median age 8.5 years, were enrolled. Median IAH was 11.9 (4 to 65) and mean IDO 12.8 (3.4 to 71). 14 (46%) children, 10 boys, were considered suspicious, 9 (30%), 8 boys, were considered as having learning disturbance (LD). 67% were diagnosed LD in 2 or more subareas, showing global learning dysfunction as discrimination, velocity and attention. There was no correlation of learning disturbance to IAH or IDO (OSA severity), but it was correlated to male gender and to older age, 50% of children aged 9 to 12 years were diagnosed LD.

Conclusion: Learning disturbances are frequent in OSA children, independent of OSA severity. Exposing time to OSA seems to be an important factor. OSA children should undergo neurocognitive evaluation.

P2277**Variance over time of the obstructive sleep apnoea syndrome (OSAS) in patients with acute stroke**

Anna Mola¹, Ana M^a Fortuna¹, Rosa M^a Miralda¹, Raquel Delgado², Joan Martí², Mercè Mayos¹. ¹Department of Respiratory, Hospital Santa Creu i Sant Pau, Barcelona, Spain; ²Department of Neurology, Hospital Santa Creu i Sant Pau, Barcelona, Spain

OSAS is a cardiovascular risk factor with a high prevalence in patients with acute stroke in whom could be related to a worse prognosis and an increased mortality. The aims are to evaluate the evolution and the prognostic role of OSAS in stroke patients. This is a prospective study in which a respiratory polygraphic (RP) evaluation was performed 7 days after stroke (acute phase) and was repeated on the third month (stable phase). 42 of 52 patients were included (age 69±12.5 years, 54.8% male, BMI 27±4 kg/m², Epworth 7±3.6) and the RP was repeated on the 3rd month in 30 patients. The acute and stable phase studies showed a predominant hypopnoeas' pattern.

Table 1. OSAS' prevalence by AHI

AHI	Acute phase patients(%)	Stable phase patients(%)
<5	3 (10%)	4 (13,3%)
≥5 & <20	9 (30%)	9 (30%)
≥20 & <30	5 (16,6%)	12 (40%)
≥30	13 (43,3%)	5 (16,6%)

Table 2. Acute & stable phase RP data

RP data	Acute phase	Stable phase	p
Total AHI (median, range)	28,45 (0,9–74,8)	21,80 (0,9–56,1)	0,002
Central AI (median, range)	0,25 (0–14,1)	0,2 (0–9,2)	0,271
Obstructive AI (median, range)	2,45 (0–52,2)	1 (0–32,6)	0,130
Mixed AI (median, range)	4,18 (0–31,5)	0,1 (0–13,3)	0,024
Hypopnoea index (median, range)	12,95 (0,6–46,7)	9,85 (0–33,7)	0,047
SatO ₂ , % (mean ± DS)	94,3±2,28	94,2±2,75	0,316
CT90 (mean ± DS)	7,23±17,25	7,49±18,99	0,095

The results suggest that OSA' study in acute stroke can lead to an overestimation of the prevalence of severe OSA, because it significantly reduce its severity in the stable phase. This information may be important when taking the decision to start CPAP treatment in acute stroke. In accordance with previous studies, there wasn't found any relationship between OSA' presence and the stroke functional outcome on the 3rd month.

P2278**Obstructive sleep apnea contributes acutely to left ventricular dysfunction independently of hypoxaemia**

Katerina Vlami¹, George Matziaras², Anastasia Papastefanou², Argiro Antarakis², Nikos Kostomitsopoulos², Vaggelis Balafas², Alkiviadis Kostakis², Spiros Papiaris¹. ¹2nd Pulmonary Department, Attikon

General Hospital University of Athens, Athens, Chaidari, Greece; ²Center for Experimental Surgery, Biomedical Research Foundation of the Academy of Athens, Athens, Greece

Background: Obstructive sleep apnea has detrimental effects on function of left ventricle. It is also known that large decreases in intrathoracic pressure occur during obstructive apnoeas.

The aim of this study was to determine the acute changes in left sided heart function that occur in response to the decreased intrathoracic pressure in an obstructive sleep apnea model in rats under condition of normoxia.

Methods: Experiments were conducted in ten male adult Wistar rats weighing 350 gr, which were anaesthetized with Ketamine-Xylazine intraperitoneally. Animals were breathing after being tracheostomized and connected in a circuit with an electromagnetic valve which was closing periodically mimicking obstructive apnoeas. Arterial saturation was at SaO₂:97% constantly. End Diastole Volume (EDV), Stroke Volume (SV) and Ejection Fraction (EF%) of left ventricle were measured with an anatomical M-mode echocardiographic method. Data analyzed and compared between quite breathing (time 0) and breathing after two hours of airway obstructions (time 0+2).

Results: The cardiac measurements were compared using the Wilcoxon signed-rank test. EDV and SV were statistically significant reduced (p<0.05) between time 0 and time 0+2. EF was reduced but not statistically significant at the same time period.

Conclusions: In this study our findings suggest that left ventricular function is affected acutely with reduction of EDV and SV after two hours of airway obstructions independently of hypoxaemia. These results suggest that in obstructive sleep apnea, negative intrathoracic pressure which occurs during apnea may contribute to changes in myocardial mechanics.

P2279**Respiratory symptoms and risk for obstructive sleep apnea in professional musicians**

Maria Antoniadou¹, Vasilis Michailidis¹, Eleni Perantoni¹, Diamantis Chloros², Athanasia Prinza³, Theodoros Gegas¹, Venetia Tsara¹. ¹2nd Pulmonary Clinic, General Hospital "G. Papanikolaou", Thessaloniki, Exohi, Greece; ²ENT Clinic, General Hospital "Papageorgiou", Thessaloniki, Exohi, Greece

Background: There is a controversy regarding the effects of playing wind musical instruments and singing on the respiratory system and the risk for nocturnal breathing abnormalities.

The aim of this study was to detect the prevalence of respiratory symptoms and the risk for Obstructive Sleep Apnea (OSA) in wind instrument players and singers. Patients - Methods: 30 professional musicians (age 37,7±8,9 years, BMI: 25,9±4,3 kg/m², 25 wind instrument players in bands and 5 singers) completed a questionnaire on demographic data and respiratory symptoms and the Berlin Questionnaire (BQ) for the assessment of the risk for OSA.

Results: Wind instrument players (80% males, 36% smokers, 32% alcohol users) reported sinusitis (24%), heartburn (20%), throat clearing (20%), jaw problems (16%), cough (16%) and nasal catarrh (16%). Singers (60% males, non-smokers, 20% alcohol users) reported reflux symptoms (60%), hoarseness (60%), throat clearing (40%), sinusitis (40%) and nasal catarrh (40%). Of the musicians, 4 instrumentalists (16%) and 1 singer (20%) had a high risk score on BQ. There was no association between smoking and respiratory symptoms in both instrumentalists and singers. Smoking was positively correlated with alcohol consumption (p<0,01, r=0,537) and heartburn (p<0,05, r=0,441) in instrumentalists.

Conclusion: Frequent respiratory symptoms and low risk for OSA were observed in wind instrument players and singers. Smoking habit together with alcohol consumption was common in instrumentalists, whereas singers adopted a healthier life style.