Rev Port Pneumol. 2016;**22(Esp Cong 4):**126-151

revista portuguesa de
PNEUMOLOGIA
portuguese journal of pulmonology

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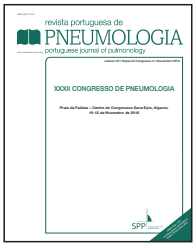

ORAL COMMUNICATIONS

XXXII Congress of Pulmonology

Praia da Falésia – Centro de Congressos Sana Epic, Algarve, 10th-12th November 2016

CO-001. HEMODYNAMIC VARIATION DURING SLEEP IN PATIENTS WITH MORBID OBESITY: DIFFERENCES BETWEEN THE IMPACT OF INTERMITTENT HYPOXIA AND PERMANENT HYPOXEMIA

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Introduction: Obstructive sleep apneas (OSA) are associated with an increased risk for arterial hypertension (HBP). HBP is a common co-morbidity in patients with morbid obesity. This group of patients presents not only OSA with repetitive desaturations but also, alveolar hypoventilation/hypoxemia with permanent hypoxia (PH). Despite this association, the impact of obesity itself, as well as, the changes in to this individuals associated with the occurrence of respiratory events is not yet fully understood.
Objectives: Examine during NREM sleep, stage N2 (N) and sleep REM (R) the hemodynamic effect of intermittent hypoxia in combination with respiratory effort, HP without obstruction of the upper airway, or the overlap of the two situations
Methods: We analyzed 135 periods of continue sleep, 85 of N and 50 of R sleep. The periods were separated in to 3 ways: 1) In 12 groups (6 N and 6 R) according its major respiratory disturb (N1 and R1 = OSA & obstructive apneas; N2 e R2 = hypoventilation; N3 e R3 = OSA & hypopneias; N4 e R4 = control group, without and/or hypoventilation; N1/2 e R1/2 com AOS & apneias obstrutivas & Hipoventilação; N2/3 e R2/3 com AOS & hipopneias & Hipoventilação; 2) 8 groups (4 N and 4 R) according its oxygen desaturation index (ODI) and percentage of SpO2 < 90% (T90):CG = controls with ODI < 15 & T90 < 30; PH = permanent hypoxemia ODI < 15 & T90 ≥ 30; PH+IH = permanent hypoxia & intermittent hypoxia ODI > 15 & T90≥ 30; IH = OSA with ODI > 15 & T90 < 30; 3) 4 groups (2 N and 2 R) according the transcutaneous PCO2 variation (H1 = ΔPCO2 < 10; H2 = ΔPCO2 ≥ 10). The systolic (sys-mmHg), diastolic (dia-mmHg) and median (MBP-mmHg) blood pressure (BP), stroke volume (SV-L) and cardiac output (CO-L) by the non-invasive beat to beat analysis via Nexfin-HD ® device. A p < 0,05 was considered statistically significant.
Results: For the three divisions we found that the mean values and the standard deviation of the Sys AP, AP and MAP in all groups with DRS to N2 and REM sleep were significantly higher than in the control group (p < 0.001) and that the values of the groups with hypoventilation/hypoxemia permanent or overlapping with OSA had significantly higher hemodynamic values than the groups without exposure to hypoventilation/hypoxia (p < 0.02).
Conclusions: We found that both exposure to intermittent hypoxia and HP are associated with a significant hemodynamic changes when compared to controls, however, HP states are associated with an increased hemodynamic instability, that, are possible correlated with a role of relief for the development of cardiovascular pathology.

Key words: *Obesity. Blood pressure. Polysomnography. Intermittent hypoxemia. Continuous hypoxia.*

CO-002. OBSTRUCTIVE SLEEP APNEA AND PERFORIN EXPRESSION. EFFECT OF CPAP THERAPY

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Introduction: Obstructive sleep apneas (OSA) influence components of the human homeostasis including the immune system. We analyzed the effect of CPAP therapy on the peripheral blood lymphocytes expressing the cytotoxic protein perforin (P).
Methods: We included 47 patients with an apnea/hypopnea index > 5/h. Following polysomnography (PSG) blood samples were drawn DI: after diagnostic night, DII: after CPAP therapy and DIII after 3 month APAP therapy. The percentage of P in $CD3^+$, $CD3^+CD4^+$, $CD3^+CD8^+$, $CD3^+\gamma d$, $CD16^+/CD56^+$ and $CD3CD16^+CD56^+$ (natural killer/NK cells) positive lymphocytes was analyzed by flowcytometry. Values before therapy were subtracted from the post therapy results (e.g DII-DI). The spearman correlation coefficient was applied to investigate the relationship between changes in PSG and lymphocyte values. A significance level of alpha 5% was used.
Results: Median PSG values and P^+ lymphocytes (25-75% CI) are shown in table 1. Arousal index and respiratory values decreased significantly following CPAP therapy while sleep efficiency did not change significantly. In some patients CPAP therapy caused relevant changes in the percentage of P^+ cells, but no statically significant result was detected. There was no consistent correlation between changes in the PSG parameters and differences in the percentage of P^+ lymphocytes. However, changes in the total perforin positive cells were exclusively depending on $CD3^+$ lymphocytes (table 2).

Table 1 CO-002

	DI	DII	DIII
Sleep efficiency [%]	83.9 (75.9-88.7)	80.75 (68.1-88.3)	87.6 (81.9-90)
Arousal-Index	52.7 ((40.3-68.8)*†	25.9 (20.5-40.5)‡	21.9 (15.2-28.2)
Apnea/hypopnea index [/h]	36.5 (20-62.9)*†	4.75 (3.2-9.5)‡	1.20 (0.6/2.4)
Oxygen desaturation índex [/h]	32.0 (17.3-55)*†	4.9 (1.6-9.5)	1.9 (0.8-5.0)
Perforin$^+$/total lymphocytes [%]	24.4 (16.7-33.0)	27.95 (19.7-35.7)	30.05 (19.3-33.8)
$CD3^+P^+/CD3^+$ [%]	15.7 (8.34-	17.6 (10.35-27.7)	17.95 (10.2-25.5)
$CD3^+CD4^+P^+/CD3^+CD4^+$[%]	1.6 (0.38-5.81)	2.54 (0.84-7.41)	3.18 (1.38-7.52)
$CD3^+CD8^+P^+/CD3^+CD8^+$[%]	25.55 (17.0-48.05)	42.6 (25.45-55.90)	37.3 (22.8-57.3)
$CD3^+\gamma\delta P^+/CD3^+\gamma\delta$ [%]	42.85 (24.8-63.6)	45.5 (30.25-68.7)	45.1 (28.0-60.9)
$CD3^+CD16^+/CD56^+P^+/CD3^+CD16^+/CD56^+$[%]	78.55 (63.0-90.9)	92.25 (83.1-95.5)	91.3 (87.0-96.4)
NK cells [%]	95.3 (92.05-97.35	96.5 (93.2-98.15)	96.6 (94.8-98.1)

NK = natural killer cells ($CD3^-CD16^+CD56^+$). p < 0,05: *I vs II; †I vs III+; ‡II vs III.

Table 2 CO-002

	DII-DI	DIII-DI	DIII-DII
P^+/total lymphocytes [%] vs $CD3^+P^+/CD3^+$ [%]$^+$	R: 0.55; p < 0.001	R: 0.78; p < 0.001	R: 0.83; p < 0.001
P^+/total lymphocytes [%] vs $CD3^+CD8^+P^+/CD3^+CD8^+$[%]	R: 0.74; p < 0.001	R: 0.41; p 0.03	R: 0.57; p: 0.002
P^+/total lymphocytes [%] vs $CD3^+CD16^+/CD56^+P^+$/ $CD3^+CD16^+/CD56^+$[%]	R: 0.68; p < 0.001	R: 0.66; p < 0.001	R: 0.52; p: 0.006
P^+/total lymphocytes [%] vs NK cells [%]	R: 0.38; p: 0.091	R: 0.33; p: 0.084	R: 0.24; p: 0.224

Conclusions: Our results demonstrate that CPAP therapy of OSA does not mandatorily change the percentage of perforin positive lymphocytes. However, high individual differences were observed. One possible explanation is that neither sleep efficiency nor the arousal index was completely normalized. Thus, a non restorative sleep under sleep laboratory conditions may be of relevance. Interestingly, observed changes in total perforin content seem to be dependent on $CD3^+$ lymphocytes and not on NK cells.
This work was supported by Fundação para a Ciência e a Tecnologia (FCT): PIC/IC/82991/2007

Key words: *Obstructive sleep apnea. CPAP therapy. Cytotoxic lymphocytes.*

CO-003. ASSESSMENT OF THE INTERACTION BETWEEN OSAS AND CARDIAC FUNCTION BASED ON RIGHT VENTRICULAR LEFT-VENTRICLE ECHOCARDIOGRAPHIC PARAMETERS

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Introduction: The presence of Obstructive Sleep Apnea Syndrome (OSAS) has a significant impact on morbidity and mortality of coronary patients. Echocardiographic assessment of left ventricular (LV) is of utmost importance, given the high prevalence of structural heart disease and systolic and diastolic dysfunction caused by OSA and the other cardiovarcular risk factors (CRF) that coexist in a large number of patients.
Methods: 40 patients (n = 40), age 69 ± 10.8 years, BMI 34.8 ± 6.7, 21.9% female. Cardiovascular risk factors (CRF): 82.5% with dyslipidemia (DLP), 50% with type 2 diabetes mellitus (DM2) of which 95% under oral antidiabetic agents, 90% with high blood pressure (hypertension), 11.4% active smokers (FM) and 60% former smokers. Echocardiographic assessment of LV: left ventricular hypertrophy (LVH) in 22.5% of cases, dilatation of the left atrium (LA) in 60% of cases, normal ejection fraction of the left ventricle in 92.5% of patients. Of patients with evaluation of diastolic function: 37.5% with altered left ventricular relaxation, 12.5% with pseudonormal standard and 2% with normal diastolic function. 7.5% of patients with known coronary artery disease percutaneous or surgically treated. LA Dilation was associated with dilation of the right atrium (RA) (r = 0.389, p = 0.013) and the presence of left ventricular hypertrophy (LVH) (r = 0.318, p0.046). The acceleration time of right ventricular outflow chamber is inversely associated with the left ventricle telesystolic diameter (LVTD) (r = -0.497, p = 0.042). The left ventricular filling pressures (LV) (E/E ‘) increase (r = 0.76, p = 0.001) and tricuspid annular plane systolic excursion (TAPSE) decreases with age (r = -0.502, p = 0,005). E/E ‘is related inversely with the angular peak systolic speed (S’) tricuspid (r = -0.678, p = 0.041). The tricuspid regurgitant jet velocity is inversely related to the mitral late filling velocity - wave (r = -0.636, p = 0.035). The time SpO2% < 90% is associated with increased apnea hypopnea index (AHI) (r = 0.547, p = 0.035) and NT-proBNP (r = 0.776, p = 12:04).
Conclusions: OSAS is associated with cardiac structural changes: RA and LA dilation and LVH. The LV cavity dilatation occurs as time of right ventricular outflow chamber acceleration decreases. Aging also contributes to the systolic and diastolic dysfunction of the right ventricle (RV). The increase in AHI is associated with increased NT proBNP, probably reflecting the biventricular “remodeling” associated with the pathology.

Key words: *Sleep Apnea Síndrome. Echocardiogram. Cardiovascular risk factors.*

CO-004. ADHERENCE TO CONTINUOUS POSITIVE AIRWAY PRESSURE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME FOLLOWED IN PRIMARY CARE UNITS

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Introduction: Obstructive sleep apnea syndrome (OSAS) has an estimated prevalence of 5% in the Portuguese adult population. Continuous positive airway pressure (CPAP) is the treatment of choice, but poor adhesion remains a major cause of treatment failure. General practitioners' (GP's) have an important role following these patients. This study aimed to determine long term adherence to ventilation therapy prescribed in four Primary Care Units (PCUs) in Portugal and its influencing factors.
Methods: A cross-sectional observational study was conducted in the population under home CPAP therapy for OSAS prescribed in four PCUs. Data was accessed through a questionnaire, clinical file consult, physical examination of the participant and treatment adherence report of the last year provided by the companies involved in respiratory care.
Results: A total of 175 patients were included in this study (80.6% participation rate). Most participants were male (78.9%) with a mean age of 63 years. About half of the patients (48%) were followed only in the PCUs. Most individuals adhered to ventilation therapy (81.5%) and in about 90.1% it was effective; 73.3% had simultaneously good adhesion and efficacy. In the population exclusively followed in the PCUs, 29.8% received regularly companies' reports and 17.9% gave it to GP's. Adherence was higher in those using facial mask (p = 0.01) and in individuals who did not report feeling uncomfortable with the use of the mask (p = 0.009). The average number of years after hospital discharge was higher in the group with low efficacy (p = 0.04). The type and duration of ventilation therapy did not relate to the adherence or effectiveness.
Conclusions: This study obtained a ventilation therapy adherence of 81.5%. National literature data show values that range from 54% to 89%; however, this study is the first that access this issue at primary care level in Portugal. Only 17.9% of the population exclusively followed in the PCUs gave the treatment's report to GPs, preventing proper monitoring in these patients. The results suggest a decrease in treatment's efficacy over time, which reinforce the importance of long term monitoring and the crucial role of GPs in care management.

Key words: *Continuous positive airway pressure. Positive-pressure respiration. Obstructive Sleep Apnea Syndrome.*

CO-005. OSA AFTER WEIGHT LOSS THROUGH BARIATRIC SURGERY

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Introduction: The relationship between obesity and obstructive sleep apnea (OSA) is well established and has been validated. Another study performed by our center has concluded that around 60% of obese patients screened for bariatric surgery have OSA, in agreement with other international results. OSA is a disease with a high impact on patients lives, mainly reducing quality of life, and increasing morbility and mortality. Due to its narrow and well established relationship with obesity we set out to verify if bariatric surgery could be and effective treatment for sleep apnea on obese patients.
Objectives: Evaluate OSA prevalence in obese OSA patients after weight loss through bariatric surgery. Identify significant differences between OSA severity before and after weight loss.
Methods: We evaluated 51 patients screened for bariatric surgery (Body Mass Index (BMI) > 30 Kg/m^2) with na Poligraphic Sleep Study (PSS) positive for OSA [AHI (Apneia hypopneia index) > 5/h], repeating the study after surgery and weight loss. The OSA severity was classified according the apnea-hypopnea index (AHI) (mild OSA: [15 > AHI ≥ 5]; Moderate OSA: [30 > AHI ≥ 15]; Severe OSA: [AHI ≥ 30]). The test statistics software used was SPSS 17.0 (t test for pared samples and Wilcoxon test, significant level α = 0.05).
Results: From the 51 patients evaluated 62.7% (32) were female and 37.3% (19) were male, with a mean age of 49.61 ± 11.88 years old. The AHI before the surgery was 29.3 ± 24.3 events/h and after the surgery 9.3 ± 8.1 events/h, with significant statistical difference (p = 0.001). After the surgery and consequent weight loss, OSA was diagnosed in 32 (62.7%) patients, 20 (39.2%) with mild OSA, 10 (19.6%) with moderate OSA and 2 (3.9%) with severe OSA. The average weight loss was 25.4 ± 10.6 Kg achieved during 206.1 ± 134.2 days.

	Before Surgery	After Surgery	P Value
Weight (kg)	116.5 ± 18.9	91.1 ± 16.6	0.001
BMI (kg/m^2)	43.1 ± 5.1	33.9 ± 5.0	0.001
AHI (events/h)	29.3 ± 24.3	9.3 ± 8.1	0.001
P90 (%)	16.6 ± 20.4	7.7 ± 17.7	0.005

	Before Surgery	After Surgery*
Without OSA	0 (0%)	19 (37.3%)
Mild OSA	19 (37.3%)	20 (39.2%)
Moderate OSA	14 (27.5%)	10 (19.6%)
Severe OSA	18 (35.3%)	2 (3.9%)

*Test Wilcoxon, p = 0,001.

Conclusions: OSA prevalence after bariatric surgery was 62.7%. We identify a statistical significant difference in BMI, AHI and P90, with an interval between PSS of 206.1 ± 134.2 days. We're able to conclude that weight loss through bariatric surgery had a significant impact in AHI, P90 as well as in OSA severity, where 19 patients (37.3%) resolved their condition and there was a significant decrease in severe cases, from 35.3% (18) to 3.9% (2).

Key words: *Obstructive Sleep Apnea. Weight Loss. Bariatric Surgery.*

CO-006. SHORT-TERM EFFECTS, LONG-TERM COMPLIANCE AND ADMISSIONS IN PATIENTS WITH OBESITY HYPOVENTILATION SYNDROME UNDER NONINVASIVE MECHANICAL VENTILATION

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Introduction: Noninvasive ventilation (NIV) is an established treatment for patients with obesity hypoventilations syndrome (OHS), however short-term physiologic effects, compliance data and admissions remains lacking.

Objectives: To describe and analyse the short-term physiologic effects of a NIV ambulatory adaptation, a compliance follow-up and admissions, in stable patients with OHS.
Methods: One hundred and twenty nine patients (91 females), with median (IQR) age of 68 (59-77), BMI of 40 (36-44), AHI of 35 (19-64) which 54% > 30, and PaCO2 of 50 (47-53) were submitted to NIV ambulatory adaptation. Ventilator settings were titrated gradually for the patient comfort with IPAP of 21 (18-24), EPAP of 9 (8-11), Respiratory Rate (RR) of 14 (14-15) and in 120 patients (93%) with a oro-nasal interface. Pulse oximetry (SpO2), transcutaneous CO2 (TcCO2), RR, Tidal Volume (Vt) were registered before and after the NIV trial. A 6 months compliance follow-up was performed.
Results: All patients had a significant improvement in RR [22 (20-24) vs 15 (15-17) bpm, p < 0,001], SpO2 [91 (88-94) vs 96 (94-97)%, p < 0,001], TcCO2 [50 (46-55) vs 43 (37-46) mmHg, p < 0,001]. Regarding the NIV compliance the average daily use (hours/day) was 6:45 (5:23-8:07) and the% of days with NIV use above 4 hours was 96 (73-100)%. Despite the 6 months follow-up, patients remain under NIV for 23 (12-34) months. Concerning the respiratory admissions during the study, 66% had 0, 18% had 1 and 11% had 2.
Conclusions: This study confirms that NIV ambulatory adaptation improves short-term physiologic parameters, the long-term compliance and low rate of respiratory admissions in OHS patients.

Key words: *Obesity-Hypoventilation Syndrome. Nonivasive Mechanical Ventilation (NIV). Long-Term Compliance and Admissions.*

CO-007. LOOP GAIN OF CHEYNE-STOKES RESPIRATION IN HEART FAILURE PATIENTS

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Introduction: Cheyne-Stokes respiration (CSR), a form of periodic breathing (PB), is common in patients with heart failure (HF). The Loop Gain (LG) represents the sensitivity of the feedback ventilatory loop of PB and consequently reflects the degree of instability of the respiratory control system. LG can be quantified with a validated mathematical model based on ventilatory cycle pattern.
Objectives: To assess intra- and inter-individual variability of LG from PB cycles in HF patients and check for possible relation with sleep stage and body position.
Methods: Polysomnographies from selected patients with LVEF < 45% and central AHI > 15/h with predominant CSR were retrospectively analyzed. Each respiratory cycle with central apnea-CSR was quantified by measuring the duty ratio (DR), where DR = (ventilatory duration)/(cycle duration), and LG, where LG = $2\pi/(2\pi DR-\sin 2\pi DR)$. Intra- and inter-individual variability of DR and LG were assessed by relative standard deviation calculation and interpretation of histograms. DR and LG according to sleep stages and body position were also analyzed.
Results: Twelve male patients were included (73 ± 5 years, BMI 28 ± 4 kg/m^2, LVEF 30 ± 8%, mean ± SD). The mean AHI values were: total 48 ± 12/h, central 46 ± 11/h and CSR index 44/h. Intra-individual distribution of LG and DR values revealed considerable variability between patients (LG relative SD range from 8 to 55%, DR relative SD range from 2 to 23%) (also see tab.1). Seven in 12 patients showed significant differences in LG between sleep stages N1, N2 and N3 according to ANOVA (only 1 event in REM sleep). Five of these patients had lower values with increasing sleep depth. For DR, 8/12 patients showed significant differences between sleep stages, five of them having higher values in deeper sleep stages (also see fig. 1). Only in 8 patients, supine vs non-supine body position could be compared, due to insufficient number of events in the other patients. 3/8 patients showed a marked significant decrease of LG in non-supine position (from 1.56 ± 0.40 to 1.29 ± 0.22, p < 0,01; from 2.12 ± 0.36 to 1.61 ± 0.29, p < 0.001; from 2.92 ± 1.48 to 1.68 ± 0.62, p < 0.001). The other 5/8 patients showed no relevant differences between body positions and also were the ones with lower LG values in general (overall mean of 1.26 ± 0.10 vs 2.20 ± 0.68). Results for DR were similar only with opposite direction of changes due to reciprocal relation to LG.

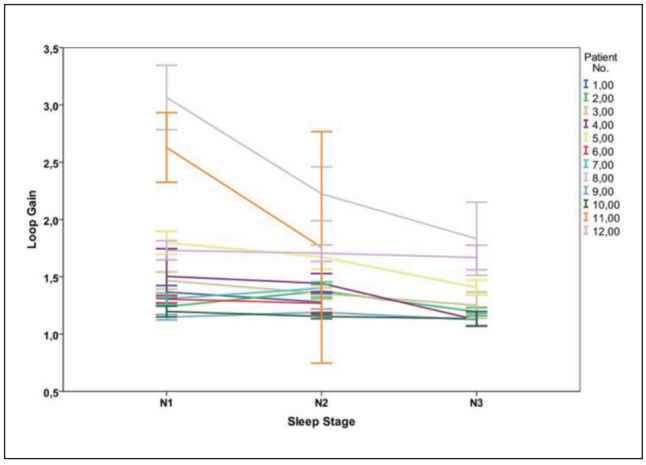

Figure CO-007. Mean LG with 95% confidence interval for single patients according to sleep stages.

Mean LG and DR values with standard deviation (SD) for each patient, calculated from the number of single events (n)

	LG Total		DR Total	
Pat. No.	Mean ± SD	n	Mean ± SD	n
1	1.32 ± 0.26	188	0.66 ± 0.07	188
2	1.31 ± 0.21	100	0.66 ± 0.08	100
3	1.39 ± 0.20	99	0.63 ± .06	99
4	1.35 ± 0.28	91	0.66 ± 0.09	91
5	1.64 ± 0.32	100	0.57 ± 0.06	100
6	1.30 ± 0.15	100	0.66 ± 0.06	100
7	1.38 ± 0.15	51	0.63 ± 0.05	51
8	2.55 ± 0.95	100	0.47 ± 0.08	100
9	1.16 ± 0.09	102	0.72 ± 0.05	102
10	1.17 ± 0.09	100	0.71 ± 0.05	100
11	2.57 ± 1.41	93	0.50 ± 0.12	93
12	1.71 ± .25	100	0.55 ± 0.05	100

Conclusions: Our data show that LG (as well as the DR) in heart failure patients with predominant CSR may vary considerably individually. In some patients, this seems to be dependent on sleep depth and in part also on body position, supine vs non-supine, while other patients exhibit only low variability and thus no relevant differences. This implies that consideration of a single mean LG value per patient is not always reliable and may not reflect de severity of PB. Individual characteristics of PB should be assessed in more detail than only in mean LG value if conclusions are to be drawn from that.

Key words: *Central apnea. Cheyne-Stokes respiration. periodic breathing. Loop gain.*

CO-008. CPAP ADAPTATION IN THE FIRST THREE MONTHS

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Introduction: The Obstructive Sleep Apnea Syndrome (OSA) is considered a sleep disorder clinically relevant, as for its repercussions and also its prevalence, the first-line treatment is the use of non-invasive ventilotherapy by Auto-CPAP (Continuous Positive Airway Pressure). In this sense, the biggest challenge in treating is adherence to the ventilator. The problem of non-adherence is complex and multifactorial, so it is essential to analyze the different behaviors of shape to be developed strategies that can prevent a weak support.
Objectives: Evaluation of the main complaints and difficulties when using the Auto-CPAP by the end of the first three months.
Methods: Retrospective study formed by 97 patients with a OSA diagnose who started the treatment with Auto-CPAP between October of 2015 and May of 2016 and also respected the initial compliance followed OSA query in Hospital Beatriz Ângelo. The data was collected in a subjective way and according to the patients report regarding the use of the equipment and in an effective way by the lecture of the equipment's data. From the sample, 34% are women and 66% are men, with average ages between 36 and 82 years, it was noticed that the severe OSA was the most encountered (42.3%) between individuals, keeping in mind that the severe OSA was the most prevalent among the female sex (45.6%) and the same levels between moderate gravity (40.6%) and severe (40.6%) were verified in the male sex. In the analyzed population, 67.1% of individuals were adhering to the therapy and 32.9% had a registered number of hours using the equipment of over six hours.
Results: In the analysis of the data, it was verified that the female sex is the least adherent (33.3%) women with severe OSA were the worse (81.8%), such as in men (42.8%). By reading the registration equipment, the value of the leakage was found increased by 41.5% of adherents and 31.3% of non-adherents. Regarding the main difficulties in the use of the equipment it was observed that the difficulty in using the mask was the most prevalent, both in the group of patients adhering (27.7%) as in non-adherents (28.1%). The adherents, 3.1% reported having red eyes upon awakening, 1.5% nasal obstruction, and 1.5% allergy to the interface, 66.2% of this group did not mention difficulties. In relation to non- adherents, the difficulties most frequently encountered were 3.1% nasal obstruction, 3.1% allergy to interface and 6.3% dysynchrony with the ventilator, with 59.4% reported having no difficulties. Relating the Epworth scale with the levels of membership it was found that those without adherence to the equipment, 40.9% maintains a range of daytime sleepiness increased, 13.4% of these being attributed to the difficulty in positioning the mask. Taking into account the observed humidification 23.1% of participants required humidifier as well as 6.5% of non-adherents.
Conclusions: Adherent patients are those who best recognize their difficulties with the treatment, and the choice of the best mask and their correct use is one of the best strategies for successful therapy.

Key words: *CPAP. Adhesion. Mask. Humidifier. Leak.*

CO-009. UTILITY OF NEW GENERATION PACEMAKERS IN SLEEP APNEA SCREENING

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Introduction: Previous studies showed a high prevalence of undiagnosed sleep apnea syndrome (SAS) in patients with cardiac pacemakers (PMs). In recent years, new generation PMs capable of identifying sleep respiratory events have been developed.
Objectives: Our purpose was to evaluate the accuracy of the new generation PMs in the diagnosis of SAS.
Methods: We designed a prospective study that included patients with PMs (Reply 200). All patients underwent polysomnography (PSG). In the same night, the respiratory disturbance indexes (RDI) of PSG (RDI-PSG) and of PMs (RDI-PM) were recorded. Agreement between RDI of PSG and PM was assessed using kappa coefficient and ROC curves.
Results: We included 33 patients. Patients had a mean age of 74 ± 10 years, a mean BMI of 27 ± 5 Kg/m^2 and most were men (64%). PSG diagnosed SAS in 76% (21% severe, 18% moderate, 36% mild). Of patients with SAS, 96% had arterial hypertension, 64% snoring, 28% witnessed sleep apnea, 20% restless sleep and 8% excessive daytime sleepiness (Epworth score > 10). Mean RDI-PSG was 17 ± 15/h and RDI-PM 19 ± 13/h. We verified a positive correlation between RDI-PSG and RDI-PM ($r = 0.361$, $p = 0.039$). In 18% of patients, RDI-PM was > 5/h but PSG didn't confirm SAS. PMs didn't identify 2 patients with mild SAS. ROC curves showed that the optimum cut-off point for diagnosing moderate/severe SAS was RDI-PM = 13/h (AUC: 0.819, sensitivity: 100%, specificity: 70%, positive predictive value: 68.4%, negative predictive value: 100%). The agreement level between methods was good ($k = 0.648$).
Conclusions: Patients with PMs present a high prevalence of SAS (76%). Most of them didn't present the usual symptoms, which could delay the diagnosis. The presence of a PM-RDI > 13/h could be a good predictor for the diagnosis of moderate/severe SAS in patients with PMs.

Key words: *Sleep apnea. Pacemakers. RDI.*

CO-010. ASSOCIATION BETWEEN SODIUM BICARBONATE AND STOP-BANG QUESTIONNAIRE IN OBSTRUCTIVE SLEEP APNEA (OSA) SCREENING

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Introduction: Obstructive Sleep Apnea Syndrome (OSAS) is the most common sleep disorder and has an estimated prevalence in general population of about 20%. The STOP-BANG questionnaire is a validated diagnostic tool, consisting of 8 Yes/No questions, in which for each positive answer is assigned 1 point. A result ≥ 3 has a high sensitivity (83.6%) in OSAS detection, but also in moderate (92.9%) and severe OSAS (100%). In OSAS the nocturnal respiratory events result in a low blood oxygenation and may lead to an intermittent hypercapnia. Thus, it is plausible to assume that intermittent nocturnal hypercapnia can increase renal retention of sodium bicarbonate ($HCO3^-$) to compensate for the acute respiratory acidosis episodes, raising serum $HCO3^-$ levels without the presence of a daytime chronic hypercapnia.
Methods: Retrospective study in which the patients included were referred for polygraphic sleep study during 2014, which also had an arterial blood gas analysis in the same time period. Anthropometric data, as well as the results of the STOP-BANG questionnaire were collected. The sleep studies were performed with level III equipment. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) program, version 20.
Results: Of the 167 patients studied, the mean age was 51.44 years, 38.9% were male, with an average BMI of 38.04 kg/m^2. According to the polysomnographic study, 59.9% of patients had OSAS, the mean AHI was 16.65/h, and 27.5% had mild OSAS, 13.2% moderate and 19.2% severe. The analysis of STOP-BANG questionnaire showed a 85% sensitivity and 39% specificity for an AHI > 5/h, with an

increased sensitivity to 89% for moderate/severe OSAS (AHI > 15/h) and 97% for severe OSAS (AHI > 30/h). When adding the $HCO3^-$ values (≥ 28 mEq/L) to the analysis, the specificity was increased (96%), but with markedly decreased sensitivity (16%). With the two steps method analysis proposed by Chung et al. the results showed a sensitivity of 42% and a specificity of 90%. In assessing the *ROC* curves, it appears that the STOP-BANG questionnaire has an area of 0.722. In association with $HCO3^-$ ≥ 28 mEq/L values has an area of 0.730 and using the two steps method the area is 0.796.
Conclusions: The STOP-BANG questionnaire has a high sensitivity for OSAS, which is higher the greater the severity of the pathology. When the quiz is associated with serum $HCO3^-$ values, specificity increases, however there is a decrease in sensitivity. The two steps method exhibits superior specificity compared to STOP-BANG questionnaire and a higher sensitivity in comparison with the association between the STOP-BANG and $HCO3^-$ values, producing a greater area under the *ROC* curve than the other two methods. In conclusion, the STOP-BANG questionnaire has an important value in the screening of OSAS. However, for a more effective ranking, the addition of $HCO3^-$ values in patients who have intermediate degrees of the questionnaire is important, especially taking into account that not all patients have the opportunity to perform diagnostic investigation studies.

Key words: *OSA. STOP-BANG questionnaire. Sodium bicarbonate.*

CO-011. CONTRIBUTION OF THE ANALYSIS OF FLOW CURVE OBTAINED BY THE CPAP IN PATIENTS WITH HF

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Introduction: The occurrence of Cheyne-Stokes respiration (CSR) in chronic heart failure (CHF) is associated with poor prognosis. The benefit of the Servo-Ventilation correction of this breathing pattern has recently been the subject of controversy, being the point of speculation that it could be associated, in a generalized manner, with an increased mortality. This concern led to a clinical reassessment, polysomnographic (PSG) and echocardiographic of all patients under the above described conditions, at the Sleep Medicine Center of the University Hospital of Coimbra (CHUC). After this re-evaluation by PSG, the introduction of CPAP corrected obstructive and central events in a substantial number of patients. However, it raised the questions: Does the CPAP therapy benefit persisted on subsequent nights? And what is the contribution of flow curves recorded in the positive airway pressure devices?
Methods: We analyzed the flow curve obtained by REMSTAR auto PR1, in patients with heart failure and left ventricular ejection fraction (LVEF) greater than 45%, resulting in a final sample of 7 patients. These patients were also subjected to an echocardiogram and subsequent comparison between the findings of the flow curve and the results of the diagnostic PSG.
Results: The study of flow curves, carried out on domiciliary Follow Up's allowed the identification of the Cheyne-Stokes respiratory pattern which, in theory, should have been corrected with CPAP during the PSG.
Conclusions: The study, even with a limited sample size, suggests that the obtained flow curves in CPAP are a fundamental tool in the control of ventilatory treatment, particularly in patients with RCS. It also illustrates the important role that the domiciliary respiratory care companies can have on good monitoring of patients and early identification of problems that require clinical and functional revaluation.

Key words: *Heart failure (HF). Cheyne-Stokes respiration (CSR). Flow curves.*

CO-012. DOES GENDER MATTER IN OBSTRUCTIVE SLEEP APNEA?

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Sleep disorders are different in several ways between men and women. We aimed to investigate gender differences in initial symptoms, associating medical diseases and polissonographic features (PF) of patients with obstructive sleep apnea (OSA) admitted to our sleep clinic. We analysed 79 patients (39 women and 40 men) and compared both groups (t-Student) regarding gender differences in OSA PF, demographic factors, symptom presentation and comorbidities. All patients were questioned for Epworth Sleepiness Scale (ESS), STOP/BANG, Berlin questionnaire and underwent a diagnostic polysomnography. Average age between groups was similar (women-58,5 years; men-56.9 years) as well as BMI (women-35,3 Kg/m^2; men-31,5 Kg/m^2) and Respiratory Distress Index (women-23,2/h; men-22,8/h). ESS (men-8,2; women-7,8; p = 0,78), STOP/BANG (men-4,3; women-3,9 p = 0,3), Berlin (men-53,8; women-74,3; p = 0,06). Witnessed apneas were significantly more prevalent in men (90%; women-53,8%; p = 0,0002) but there was no statistical difference in non-refreshing sleep, morning headaches or excessive daytime sleepiness. Women were more likely to be diagnosed with depression (p = 0,0003) and insomnia (p = 0,02). There was no statistical difference between both groups regarding HTA, diabetes or COPD. Sleep efficiency was lower in men (55% vs 69.2%; p = 0.09), but there was no statistical difference between genders regarding arousals, % of REM sleep or worsening respiratory events in REM sleep. In our sample there were not many differences between men and women. There doesn´t seem to be a pre-test questionnaire more suitable for a determined gender when OSA is suspected. PF were also similar between genders. Witnessed apneas were the only presenting symptom with statistical difference and usually referred to by the partner. Depression and insomnia were the only comorbidities statistically more prevalent in women.

Key words: *Obstructive sleep apnea. Gender.*

CO-013. TRANSBRONCHIAL CRYOBIOPSY IN TWO LUNG LOBES- DIAGNOSTIC ACCURACY

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Introduction: Transbronchial cryobiopsies (TCB) has an increasing role in the diagnosis of diffuse lung diseases (DLD). In the series of cases published so far, there are references to TCB performed only in one lobe. However in what surgical lung biopsy (SLB) is concerned, the guidelines recommend biopsies in two lobes namely in interstitial pneumonitis and other fibrotic DLD since it can show different histologic features that are essential for a precise diagnosis.
Objectives: Evaluation of patients with DLD submitted to TCB in two different lung lobes, the diagnostic accuracy and complications of the procedure.
Methods: Patients with DLD submitted to TCB in two lung lobes were included. TCB were performed with a flexible probe 2.4 mm, introduced in the working channel of a fiberoptic bronchoscope and the patients were deeply sedated, intubated with a rigid bronchoscope and ventilated with jet ventilation.
Results: Between September 2014 and July 2016, 101 patients (15-51.7% men) with DLD were submitted to TCB, 29 of them in two different lung lobes. In 21 (68.9%) of these patients TCB were

preformed in left lung. TCB medium number was 4.2 (2-5). The diagnostic yield was significantly higher- 26 (89.6%), which is even more relevant since in all this cases a SLB would be consider if a final diagnosis had not been achieved. The more frequent diagnosis were usual interstitial pneumonitis (UIP) associated with hypersensitivity pneumonitis-10 (34.4%), chronic hypersensitivity pneumonitis (without UIP like pattern)-6 (20.6%) and idiopathic pulmonary fibrosis- 3 (10.3%). Regarding complications, pneumothorax occurred in a significant number of cases- 8 (27.5%)- although without any case of prolonged air leak (medium time of hospitalization of 3 days). TCB in two lobes was associated with a higher frequency of pneumothorax when compared with only one lobe- 27.5% versus 16.6%. In 7 (24.1%) patients TCB evaluation allowed to modify the initial diagnostic hypothesis while in the rest of the 22 patients (26.9%) the histologic assessment of the samples confirmed the initial hypothesis, always after a multidisciplinary judgment.

Conclusions: In this series of DLD patients, TCB in two lobes was associated with a high diagnostic yield, avoiding SLB in a significant number of patients. Although a high number of pneumothorax, they were easily managed without any case with prolonged air leak.

***Key words**: Diffuse lung diseases. Diagnosis. Transbronchial cryobiopsy.*

CO-014. INTERSTITIAL LUNG DISEASE AND MYOSITIS ANTIBODIES

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Introduction: The idiopathic inflammatory myopathies (IIM) are a group of connective tissue diseases marked by muscle inflammation. In some cases there is extrapulmonary involvement like interstitial lung disease (ILD). ILD can be an early manifestation of IIM and in some cases the only manifestation. In last years, several antibodies have been associated with IIM: myositis-specific antibodies (MSA) and myositis-associated antibodies (MAA). The presence of certain antibodies appears to be associated with an increased risk of ILD. The aim of this study was to characterize patients with positive MSA e MAA followed in pulmonology-interstitial lung disease appointment.

Methods: It was included all patients followed in pulmonology-interstitial lung disease appointment in June 2016, with at least one this antibodies positive: anti-SRP, anti-Mi2, anti-Jo1, anti PL-7, anti PL-12; anti OJ, anti-EJ, anti-Ro 52, anti-PM/Scl 100, anti-PM/Scl 75, anti-Ku. The date of these patients was retrospectively collected.

Results: The results are listen in the table.

Table CO-014

N patients	12
Sex (N patients; %)	
Male	5 (41.7%)
Female	7 (58.3%)
Age at diagnosis (mean ± SD)	61 ± 10
Current diagnosis (N patients; %)	
Antisynthetase syndrome	6 (50%)
Interstitial pneumonia with autoimmune features	3 (25%)
ILD associated with overlap syndrome	3 (25%)
Temporal relationship between diagnosis of ILD and connective tissue disease (N patients; %)	
ILD before	2 (17%)
ILD after	4 (33%)
ILD and connective tissue disease at the same time	3 (25%)
Only ILD	3 (25%)
Antibodies profile (N positive patients)	
Anti-Mi 2	0
Anti-Ku	0
Anti-Jo 1	5
Anti-PL 7	2
Anti-PL 12	0
Anti-Ro 52	6
Anti-PM/Scl 100	3
Anti-PM/ScL 75	1
Anti-SRP	0
Anti-OJ	0
Anti-EJ	1
Antibodies association (N positive patients)	
Anti-Jo 1 + anti-Ro52	3
Anti-PL 7 + anti- Ro52	1
Anti-Ro 52 + anti-PM/Scl 100+ anti-PM/Scl 75	1
Muscle enzymes (N patients; %)	
Positive creatine kinase (> 174 U/l)	5 (50%)
Creatine kinase	236 ± 270
Positive aldolase (> 7.6 U/l)	6 (50%)
Aldolase	10 ± 8
Other clinical manifestation (N patients; %)	
"Mechanic's hands"	3 (25%)
Raynaud phenomenon	3 (25%)
Heliotrope eruption	1 (8.4%)
Gottron's papules	1 (8.4%)
Articular involvement	3 (25%)
CT scan findings (N patients; %)	
NSIP	8 (66.7%)
NSIP+ bronchiolitis obliterans (OB)	2 (16.6%)
NSIP+ organizing pneumonia (OP)	1 (8.3%)
NSIP + OB + OP	1 (8.3%)
Respiratory function (mean ± SD)	
FVC l	2.18 ± 0.35
FVC%	71.8 ± 13.5
FEV 1 l	1.79 ± 0.36
FEV 1%	73.2 ± 15.7
FEV1/FVC	83.2 ± 11.6
TLC l	4.18 ± 0.64
TLC%	79.3 ± 12.7
DLCO%	52.6 ± 20.3
DLCO/VA %	73.4 ± 16.2
Six minute walk test (mean ± SD)	
Distance	408 ± 96
Desaturation %	8 ± 6

Conclusions: The presence of MSA and MAA should be investigated in patients with ILD, as ILD can be an early manifestation of MII. In this group of patients, 3 had ILD associated with positive MSA/MAA and without others manifestations. Only half had positive muscle enzymes. Several anti-myositis antibodies were identified: the most frequent was anti-Jo1, an antisynthetase antibody.

Key words: *Interstitial lung disease. Myositis antibodies.*

CO-015. PTX3 REGULATES GRANULOMATOUS INFLAMMATION IN SARCOIDOSIS BY CONTROLLING T CELL DYNAMICS

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Introduction: Sarcoidosis is a systemic inflammatory disease of unknown etiology with lung involvement in almost all cases. Immunopathologic hallmarks include noncaseating granulomas characterized by activated T cells and macrophages, polarized Th1 and Th17 cytokine expression, and local production of immunoregulatory mediators. In this regard, the long pentraxin 3 (PTX3) is a regulatory molecule at the crossroads of innate immunity and inflammation with a role in the pathogenesis of several lung diseases.
Objectives: Sarcoidosis represents an unmet clinical condition with unclear cellular and molecular mechanisms of pathogenesis. Here, we aimed at dissecting the contribution of PTX3 to granulomatous inflammation in sarcoidosis.
Methods: We resorted to a mouse model of granulomatous inflammation using PTX3-deficient mice, in which we characterized granuloma dynamics, leukocyte recruitment, cytokine production and expression of inflammatory mediators. These pre-clinical studies were complemented by genetic and functional studies in patients suffering from sarcoidosis.
Results: We identified PTX3 as an integral component of pulmonary granulomas and a pivotal factor controlling inflammation in sarcoidosis. Significantly larger granulomas were formed in the lungs from PTX3-deficient mice compared to wild-type animals, a phenotype associated with enhanced cellular infiltration and increased levels of proinflammatory cytokines in the pulmonary microenvironment. These hallmarks of susceptibility were abrogated following treatment with recombinant PTX3. We identified alveolar macrophages as the predominant PTX3-expressing immune cell in lung granulomas and their function in regulating T-cell dynamics is currently under investigation. These findings were translated to human patients, in which circulating levels of PTX3 were found to be significantly increased. Moreover, genetic variants in PTX3 were associated with an increased risk of sarcoidosis, by critically regulating leukocyte recruitment and inflammation in the lung.
Conclusions: These findings reveal a previously unanticipated role for PTX3 during granulomatous inflammation in sarcoidosis and disclose PTX3 as a promising immunotherapeutic target.

Key words: *Pentraxin 3. Sarcoidosis. Granuloma. Immunopathology.*

CO-016. CHRONIC HYPERSENSITIVITY PNEUMONITIS – IMPLICATIONS OF USUAL INTERSTITIAL PNEUMONIA PATTERN IN DISEASE SEVERITY

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Introduction: Chronic hypersensitivity pneumonitis (cHP) has a wide variable clinical presentation and evolution, and there is a subgroup of patients with usual interstitial pneumonia pattern (cHP/UIP) which information is scarce.
Objectives: Clinical, functional and radiological characterization of patients with cHP. Evaluation of their evolution, comparing those with cHP/UIP with other forms of cHP.
Methods: Retrospective analysis of cHP patients, followed at diffuse lung diseases outpatient clinic. The disease behaviour was stratified according with ATS/ERS classification for idiopathic interstitial pneumonias, in 3 groups: stable disease (group 1); progressive, irreversible disease, with potential for stabilization (group 2); progressive, irreversible disease, despite treatment (group 3). In the group with cHP/UIP, HRCT fibrosis score was used for quantification of disease extent.
Results: We included 86 patients with mean age of 61.5 (± 14) years, and 66.3% (n = 57) were female. Most (84.5%) were never smokers. Bird exposure was the most frequently detected (69.8%). At baseline functional assessment, mean values of FVC of 74.6 (± 19.7)%, FEV_1 of 76.2 (± 20.5)% and TLC of 76.5 (± 17.6)%. Almost half of patients (48.8%, n = 42) had cHP/UIP, with a mean of fibrosis score of 8.4 (± 2.8). Patients with cHP/UIP had significantly lower values of D_LCO (44.5 (± 18.5)% vs 57 (± 21.5)%, p = 0.015) and bronchoalveolar lavage lymphocytosis (27,1 (± 22.6)% vs 45 (± 19.6)%, p = 0.001), compared with the other cHP forms. Regarding disease behaviour in cHP/UIP group, 9.1% had stable disease (vs 31.8% in other forms of cHP), 45.5% had progressive, irreversible disease with potential for stabilization (vs 38.6% in other cHP) and 45.5% had progressive, irreversible disease despite therapy (vs 29.5% in other cHP). Analysing only the patients with cHP/UIP disease behaviour, significant differences were found in fibrosis score (group 1 vs 2: p = 0.036; group 1 vs 3: p = 0.017, with significantly lower values in group 1), FVC (group 2 vs 3: 83.6 (± 17)% vs 58.9 (± 16.3), p = 0.02), TLC (group 2 v s3: 83.2 (± 16)% vs 61.9 (± 14.3)%; p = 0.006) and D_LCO (group 2 vs 3: 55.5 (± 15)% vs 27.4 (± 14.5)%, p < 0.001). Therapeutic approach included steroids and immunosuppressants in 62.2%, only steroids in 21.6% and 16.2% didn't make any anti-inflammatory therapy. Fourteen patients were referred for lung transplantation, 8 with cHP/UIP. During the follow-up period, there were 19 deaths, registering a mortality of 26.3% in patients with cHP/UIP and 22.5% in other forms of cHP.
Conclusions: cHP showed a wide variability in disease severity and progression, standing out the group with cHP/UIP. This subgroup presented at diagnosis a greater functional severity and extent of fibrosis, as well as a less favourable evolution, and so may require higher monitoring and more invasive therapeutic measures, such as referral for lung transplantation.

Key words: *Chronic hypersensitivity pneumonitis. Evolution. Usual interstitial pneumonia pattern.*

CO-017. THE 6-MINUTE WALKING TEST – FOLLOWING PATIENTS WITH DIFFUSE INTERSTITIAL LUNG DISEASE

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Introduction: The 6-minute walking test (6MWT) is a reliable test for evaluating patients with chronic lung disease. This test is useful

in the evaluation of therapeutic efficacy. The shortest distance is associated with mortality. The distance and peripheral capillary O2 saturation (SpO2) at the end of the test are patient dependent, so there are new indicators that attempt to standardize the results as the *distance-saturation product* (DSP).
Objectives: Evaluate the differences in 6MWT and pulmonary function (PF) of patients with diffuse interstitial lung disease who have done two 6MWT at least with 6 months between them, followed in the consultation of: Patologia Profissional Respiratória e do Interstício do Serviço de Pneumologia do HG-CHUC from 07/2015 to 07/2016.
Methods: This is a retrospective and exploratory study. The sample was collected using the computer program SAM® and treated statically in Excel®.
Results: The sample consisted of 20 patients, 60% were women, mean age 56.9 years, the most frequent pathologies in this sample were: sarcoidosis (38%), chronic hypersensitivity pneumonitis (15%) and pulmonary fibrosis (15%). It was identified exposure to birds in 10% of patients and 10% other ceramics. Regarding FP evaluated in the two moments: FEV1 77.4% vs 81%, FVC 81.7% vs 83.6%, FEV1/FVC 78.7% vs 80.24%, CPT 80% vs 78.2%, DLCO 63.4% vs 62.1%. Regarding the 6MWT: 416m distance in both, SpO2 91.6% vs 90.3% and DSP 380m% vs 375m%. Note that 70% of these patients were using oral corticosteroids, 15% started corticosteroid therapy, 20% started additional immunosuppressive therapy and 5% started perfenidone between the two 6MWT. About 5% of patients are waiting for lung transplantation. Analyzing by groups, with the diagnosis of sarcoidosis regarding FP: FEV1 92.2% vs 99.7%, FVC 102% vs 105.6%, FEV1/FVC 75.57% vs 77.61% CPT 94.9% vs 87.9%, DLCO 67.8% vs 70.9%. Regarding the 6MWT: distance 433.5m vs 435.8m, SpO2 96.3% vs 94.5% and DSP 417m% vs 411.7m%. With the diagnosis of pulmonary fibrosis, in relation to the FP: FEV1 61.7% vs 59.8%, FVC 65.7% vs 64.5%, FEV1/FVC 76.69% vs 76.82%, CPT 69.7% vs 61.7%, DLCO 61.6% vs 57.3%. Regarding the 6MWT: distance 396m vs 382m, SpO2 88% vs 85% and DSP 349.1m% vs 320.6m%.
Conclusions: This sample is heterogeneous and small, when evaluated it seems to be little difference between the two moments of evaluation. But when we subdivide the sample, it is clear that patients with sarcoidosis have better FP and 6MWT, in addition there is an improvement in function between the two time points, probably because 13% of patients in this group have initiated corticosteroid therapy and 13% additional immunosuppressive therapy. For patients with pulmonary fibrosis, this is a group with more compromised respiratory function and whit worsening of the FP and the 6MWT, despite treatment, and a patient has been proposed for lung transplantation. The use of the 6MWT seems to be useful in assessing the efficacy of therapy and progression of interstitial lung diseases.

***Key words**: 6MWT. Interstitial lung disease. DSP.*

CO-018. SARCOIDOSIS: A RETROSPECTIVE STUDY

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Introduction: Sarcoidosis is a systemic granulomatous disease of unknown etiology. Fundamental abnormality is the development and accumulation of epithelioid granulomas without caseation.
Objectives: Characterize the clinical presentation, biochemical, radiological, histopathological and lung function at diagnosis of sarcoidosis and clinical outcome.
Methods: Retrospective study of patients followed in Interstitial and Respiratory Professional Pathology Consultation and Interstitial, between 2014 and July 20, 2016, with a diagnosis of sarcoidosis. Evaluated clinical, biochemical, radiological, pathological findings, pulmonary function and treatment at diagnosis, and clinical outcome.
Results: Followed 55 patients in consultation, 40% female, mean age at diagnosis of 39.9 (± 9.1) years and 40.9% aged between 31 and 40 years. Current average age of 51.5 (± 9.2) years. At diagnosis, 12.7% of patients were asymptomatic, with only radiological changes. Of symptomatic patients, 29.1% had chest symptoms, 14.5% had exclusively extrathoracic manifestations and 43.6% association of pulmonary and extrapulmonary symptoms. Thoracic symptoms, dyspnea (49%) and cough (47.3%) were the most common, followed by chest pain (18.2%), sputum (16.4%) and wheezing (14.5%). The most common extrathoracic manifestations were: asthenia (16.4%), weight loss (14.5%), maculopapular skin lesions (10.9%) and arthralgia (10.9%). Ninety-eight percent of patients underwent respiratory support at diagnosis, that no significant changes to 43.6%. It was obstructive ventilatory change in 38.9%, 5.6% and restrictive in mixed in 7.3%. The carbon monoxide diffusing capacity found was reduced to 20.4%. An increase of serum angiotensin converting enzyme at 70.9%, with an average of 93.8 U/L. Of the patients who underwent bronchoalveolar lavage, 27.3% showed lymphocytic alveolitis and lymphocytes compared CDA/CD8 greater than 3.5. Obtained anatomopathological confirmation in 52.7%, of which 32.7% by transbronchial biopsy, 10.9% for surgical biopsy by mediastinoscopy, 5.5% by biopsy of skin lesion, 1.8% by biopsy of axillary node and 1.8% for cervical ganglion biopsy. The radiological classification, 34.5% of patients had sarcoidosis stage I, 45.5% stage II, 10.9% and 9.1% stage III stage IV. Corticosteroid therapy was initiated in 38.2% of patients and was associated immunosuppressant in only 9%. Note that one patient is doing corticosteroid therapy association with infliximab and 1 patient is doing just hydroxychloroquine. Occurred evolution to chronicity in 63.6% of patients, most with thoracic and extrathoracic manifestations.
Conclusions: Most patients, young adults, had respiratory symptoms at diagnosis. The imaging proved to be a key test for the diagnosis, as well as laboratory and functional markers of activity. Histological confirmation was obtained in most patients. Systemic corticosteroid therapy was the most commonly used therapy. Sarcoidosis is a disease with several phenotypes and severity consequently with different approaches. However, no systematic examination and essential in the diagnosis and tracking algorithm.

***Key words**: Sarcoidosis. Granulomas. Corticosteroid therapy.*

CO-019. ORGANIZING PNEUMONIA – CASE SERIES

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Introduction: Organizing pneumonia (OP), whether cryptogenic (COP) or secondary (SOP) is characterized by suggestive clinical and imaging features and good corticosteroid response.
Objectives: To characterise the patients followed in our interstitial lung disease outpatient clinic with OP.
Methods: Retrospective study of the medical records of all patients with OP diagnosis from 2009 to 2016. Data regarding demographics, aetiology, clinical and radiological presentation, histology, lung function tests (LFT), treatment and follow-up was collected.
Results: 13 patients were included, mostly female (8) with a mean age of 58,7 years and a mean follow-up time of 131,7 weeks. 9 patients had COP, while 4 had SOP, with the most common aetiology for SOP being recent H1N1 influenza infection (2). Eleven patients were symptomatic, most commonly with non-productive cough and malaise. The most common radiological findings were consolidation (12) and ground-glass opacities (8), mostly bilateral (11) and non-migratory (8). Histological confirmation was obtained in 10

patients, all of which through computed-tomography guided transthoracic needle biopsy (CT-TTB). LFT were often unaltered (7) or revealed mild restriction (5). All patients received corticosteroid therapy during 46,5 weeks on average with mean initial dose of 0,77 mg/kg/day prednisone or equivalent. 2 patients had relapses and the mean relapse-free time was 50,2 weeks.
Conclusions: Our results overlap those of larger studies (Lazor et al. Am J Respir Crit Care Med. 2000;162:571-7) with a few exceptions. In our series, histology was obtained in most patients, exclusively through CT-TTB, with positive and accurate results regarding the favourable treatment response and the exceedingly low relapse rate.

Key words: *Organizing pneumonia. Interstitial lung disease. Transthoracic needle biopsy. Orphan lung disease.*

CO-020. PULMONARY LANGERHANS CELL HISTIOCYTOSIS (PLCH), A RETROSPECTIVE STUDY AND LITERATURE REVIEW

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The PLCH is a rare interstitial disease that primarily affects young adults. We pretend to review the current literature on PLCH and create a database on rare lung diseases to apply the insights gained from fundamental research to the clinic. Considering the limited epidemiological data available regarding PLCH and the lack of population-based studies, we conducted a retrospective study. Between 2009 and 2014, 12 patients were followed at the Department of Pneumology, in Interstitial Lung Diseases Consultation. PLCH was found more often in males (66.7%) with an average age of 46 (± 12) years. PLCH tended to present at a younger age though women. All the patients had a history of current or prior tobacco smoking. Exertional dyspnea and cough were the most common symptoms (10 patients); 1 patient had extra-pulmonary manifestation, with bone lesion involving the *clivus*. The diagnosis was based on bronchoalveolar lavage (BAL) CD1a and S100 cells positivity (6 patients), transbronchial lung biopsy (3 patients), or clinical-radiological data (3 patients). The main patterns on chest CT scan were the presence of cysts involving upper lung zones and coexistence of cysts and micronodular pattern in the middle-upper zone. The only required therapy was smoking cessation. The present study, as according to others, showed that PLCH is strongly associated with tobacco smoking and important diagnostic data was obtained with BAL and chest CT scan associated with clinical history. Differently from previous studies PCLH was diagnosed at a younger age though women. In conclusion, PLCH is a rare multi-systemic disorder, frequently progressive, with a variable and unpredictable course.

Key words: *Histiocytosis X. Cysts. Micronodular. S100. CD1a.*

CO-021. NIVOLUMAB MONOTHERAPY IN PREVIOUSLY TREATED ADVANCED STAGE NON-SMALL CELL LUNG CANCER LUNG CANCER (NSCLC). RETROSPECTIVE ANALYSIS

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Introduction: The monoclonal antibody anti-PD-1 Nivolumab has shown good results in terms of response rates, survival and treatment tolerance in patients with NSCLC that had been previously treated with one or more chemotherapy lines. These results were proven on a clinical trial basis but data on a routine clinical practice is still scarce.
Methods: Retrospective analysis of all the NSCLC patients previously treated with chemotherapy, that have been treated with Nivolumab in Centro Hospitalar São João between August 2015 and July 2016. Clinical data, pathological features, response rates, survival analysis and treatment tolerance were analyzed.
Results: In a 12-month period, 19 patients with NSCLC have been treated with Nivolumab (3 mg/Kg/2 week), with an average age of 67.7 years and a male predominance (84.2%; n = 16). Adenocarcinoma was the most common histological type (68.4%; n = 13) followed by squamous cell carcinoma (15.8%; n = 3) and adenosquamous carcinoma (15.8%; n = 3). A significant percentage of patients had a stage IV disease at the time of the diagnosis (42.8%; n = 8). The majority of the patients that performed treatment have several previous lines of chemotherapy (26.2% in 2nd line; 47.4% in 3rd line; 26.3% in 4th line or more). The median number of received Nivolumab cycles was 7.9. In 5 patients a treatment response was not possible to be evaluated (2 cases of early death after just one cycle; 3 cases without sufficient follow-up time). Of the remaining 14 patients, a favourable response was seen in 9 (64.3%; partial response in 6 – 31.6%; stabilization in 3 – 15.8%) and disease progression in 5 (35.7% - 3 of this patients died). The average survival (after the beginning of Nivolumab treatment) has not been achieved yet. Treatment with Nivolumab was well tolerated by the overall majority of the patients, with just 3 cases of secondary effects (cutaneous – n = 1; endocrinophaties – n = 2). Treatment had to be suspended in only one patient with secondary adrenal insufficiency.
Conclusions: Nivolumab constitutes an important therapeutic approach in NSCLC advance stage patients, with promising response rates, long survival and a good tolerance profile, even in patients that have been subjected to multiple chemotherapy lines.

Key words: *Immunotherapy. Lung cancer. Nivolumab.*

CO-022. CRIZOTINIB ACTION IN ALK+ WITH PULMONARY ADENOCARCINOMA, ADVANCED DISEASE

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Introduction: Some of the non-small cell lung (NSCLC) carcinomas express, due to chromosomic inversion at 2p21 and 2p23, the fusion gene EML4 (echinoderm microtubule associated protein like 4) – ALK (anaplastic lymphoma kinase). The presence of this fusion gene results in genetic activation and deregulation with implications in tumour proliferation and hence reduced survival. The inhibition of the fusion protein EML4'ALK results in inhibition of cellular growth.
Objectives: Inform, based on our clinical experience, the results of crizonitib therapy using an initial dose of 250 mg 2id in patients with advanced adenocarcinoma (ADC-IV), and previously treated with platinium duplet.
Results: Between January, 2015 and June, 2016, we diagnosed 86 patients with ADC-IV. Every patient was investigated for EGFR, ALK and ROS1. In 14 of 86 patients were ALK positive by FISH (16.3%). Of these 64.3% are women. All patients are non-smokers. In 11 patients we have at least a chest CT for response evaluation. The rate of objective response was 72.7%. The disease control rate was 90.9%. This response was observed in the first 3 months of therapy. Of the 14 ALK positive patients, it was necessary to reduce the dose in 3 patients due to hepatic toxicity, pneumonitis and renal insufficiency.
Conclusions: Our experience supports the clinical benefit of crizotinib in ALK positive patients. The drug is well tolerated with a profile of security similar to the described in literature.

Key words: *ALK. Oncology. Lung. Adenocarcinoma.*

CO-023. NEXT-GENERATION SEQUENCING FOR MOLECULAR DIAGNOSIS OF TUMOUR SPECIMENS FROM PATIENTS WITH ADVANCED LUNG ADENOCARCINOMA

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Introduction: Molecular driven therapy of advanced lung adenocarcinoma implies the detection of specific genetic alterations predictive of response to agents targeting specific pathways. *Next Generation Sequencing* provides simultaneous analysis of hundreds of genes in samples with low DNA quantity with a fast, sensitive technology, even in the presence of low frequency alleles.
Methods: In this study, the enrichment strategy used was the Ion Ampliseq Colon and Lung panel for tumour biopsies. All amplified products were used to prepare libraries and sequenced using the Ion PGM or S5xl system. The QuantStudio 3D Digital PCR System was used to confirm selected results. 92 patients with advanced lung adenocarcinoma previously tested for EGFR mutation by PCR and for ALK by FISH were included. Significant genetic alterations obtained by NGS are described and compared with those identified by standard techniques.
Results: NGS was applied to 92 diagnostic samples, corresponding to 63 (68.5%) wild type (WT) patients, 21 (22.8%) with EGFR mutations and 8 (8.7%) with ALK-EML4 translocation. The Ion Torrent PGM confirmed the presence of the EGFR mutation in 20 (95.2%) patients and detected a new case with p.L858R. Among patients classified as WT, 18 had a KRAS mutation, 3 BRAF V600E and 1 STK11; among ALK patients, 2 had a KRAS mutation. Other significant concurrent genetic alterations were found: 2 patients with EGFR and PIK3CA mutations, 2 with EGFR and KRAS and sporadic cases with STK11 and TP53. Only 40 patients remained classified as WT (43.5%).
Conclusions: NGS is useful for detection of actionable mutations in small tumour biopsies and cytology specimens of lung adenocarcinoma. It allows the identification of more candidates to targeted therapies and the detection of concurrent mutations that can impact prognosis and treatment efficacy.

Key words: *Next Generation Sequencing. Lung Cancer. Mutations.*

CO-024. LUNG CANCER AND HIV, CASUISTRY OF THE LUNG CANCER DAY HOSPITAL OF NORTH LISBON HOSPITAL CENTER – POLIDO VALENTE; 2013-2015

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Introduction: Lung cancer (LC) is the most common non-AIDS-defining malignancy in patients with HIV infection, and treatment is a major challenge in these patients. Nearly 50% of HIV+ patients treated with chemotherapy suffer from medication-related toxicity. Among patients with advanced stage LC, those with HIV have a 3-6 month expected survival time compared with 8-12 months in those without HIV.
Objectives: To characterize the patients treated in the lung cancer day Hospital at North Lisbon Hospital Center (NLHC).
Methods: A retrospective observational study of patients treated at the lung cancer day hospital of NLHC from January 2013 through November 2015 was performed using an existing database together with medical chart review. Descriptive statistics were calculated, specifically: measurements of central tendency and dispersion, trends, and frequency tables.
Results: Of the 855 patients treated at the center, eight (0.94%) were HIV positive (95%CI 0.4-1.9%). Of the eight patients with LC and HIV, 1 (12.5%) was female and seven (87.5%) were Male. The mean age was 60 years (SD ± 14). Performance status scores of I (n = 5; 62.5%), II (n = 2; 25.0%) and III (n = 1; 12.5%) were recorded. Mean CD4+T-cell count was 336 cells/μL, and five (62.5%) patients had undetectable viral load. Histologic types of lung cancer encountered were: seven (87.5%, 95%CI 47.4-99.6%) adenocarcinomas and one (12.5%, 95%CI 0.3-52.7%) small-cell lung cancer. One patient (12.5%) was in each of stage IA and IB, and six (75%) were in clinical stage IV. Chemotherapy was the most common treatment option, used in four (50%, 95%CI 15.5-84.3%) patients. Mean time to initiation of treatment was six weeks. Of those who underwent surgery, one was in stage IA and the other in stage IB. Both of these patients had no evidence of recurrence for the duration of follow up (29 months and 38 months, respectively). Of the four patients for whom chemotherapy was the primary treatment option, two (50%) progressed to the third cycle and three (75%) died. The mean time to progression was 3.5 months (SD ± 0.7). The mortality rate in these eight patients was 62.5% (n = 5; 95%CI 24.5-91.5%). Mean survival time after diagnosis was four months (SD ± 1.6).
Conclusions: Contrasting with other studies in which mean age was 45, the mean age in our patients was 60 years, probably because at the time of cancer presentation the majority of our patients already had good HIV control with undetectable viral load and mean CD4+ T-cell count of 336 cells/μL. However, in spite of HIV infections controlled, mean time to progression and survival time were low (3 and 4 months respectively) compared to population without HIV infection, probably due to underlying chronic inflammation in HIV patients as well as substantial medication interactions that complicate treatment. Additional research regarding lung cancer in people living with HIV is necessary to optimize the therapeutic approach to these patients.

Key words: *Lung cancer. HIV.*

CO-025. DRIVER MUTATIONS IN LUNG CANCER, DISTINCT OUTCOME?

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Introduction: Nowadays, according to the guidelines, all patients with advanced lung adenocarcinoma should be tested for mutations in the epidermal growth factor receptor (EGFR) and anaplastic lymphoma kinase (ALK) genes. As previous descripted in the literature, the presence of mutations predicts a much higher likelihood of benefitting from treatment with molecular directed therapies.
Objectives: To evaluate if in the daily clinical practise there are distinct outcome on response rate, progression-free survival (PFS) and overall survival between patients with a specific mutation vs those without it.
Methods: Retrospectively, we reviewed lung cancer patients (non squamous stage IIIb or IV) screened for EFGR mutation or ALK-EML4

translocation, followed in a tertiary university hospital between November 2013 and January of 2015.
Results: The molecular evaluation was done in 123 patients, EGFR mutation (exons 18 to 21) was detected in 19/120 (15.4%) adenocarcinomas and ALK-EML4 translocation in 10/67 (8.1%). The median age at the time of the diagnosis was 68 years (67 years and 59.5 years, respectively). Regarding the stage of the disease, 84.2% of the EGFR mutations and 50% of ALK-EML4 translocations were presents in patients with stage IV. EGFR was positive in 13/33 (39.4%) non-smokers ($p < 0.05$) and ALK-EML4 translocation in 3/12 (25%) non-smokers; while the corresponding figures for smokers were 6/87 (6.9%) ($p < 0.05$) and 7/55 (12.7%), respectively. In total, considering presence of any mutation, 12 patients (41.4%) had partial response, 7 (24.1%) had stable disease and 5 (17.5%) progressed ($p < 0.05$). Mortality in the presence of any driver mutation was 58.6% (17/29 patients) compared with 78.7% in whom the mutations were absents (74/94 patients). PFS was 14.2 months (CI95%, 2.84-25.55) for patients with driver mutations and 6.8 months (CI95% 5.11-8.45) if its absence ($p < 0.05$). The overall survival with any driving mutation was 23.6 months (CI95% 4.3-42.89) ($p < 0.05$).
Conclusions: Although we are presenting a small series of a single hospital, our data identify a significant reproducibility with the clinical trial results allowing us to conclude that driver mutations patients will has distinct outcomes, even in daily clinical practise.

Key words: *Lung cancer. EGFR.ALK.*

CO-026. VEMURAFENIB AS THERAPEUTIC OPTION IN BRAF-V600E LUNG ADENOCARCINOMA WITH LEPTOMENINGEAL DISEASE

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Introduction: BRAF mutations occur in around 3% of non-small cell lung cancers (NSCLC) and V600E accounts for 50%. BRAF V600E is an attractive molecular target for treatment with the inhibitor of BRAF kinase, but ideal treatment is still not defined. A case of a patient with BRAF-mutated NSCLC detected by next generation sequence (NGS) Ion Torrent technology who presented with leptomeningeal carcinomatosis and was treated with the selective BRAF inhibitor vemurafenib is described.
Case report: 58 years old woman, non-smoker, who presented in the emergency department, in July 2015, with pericardial effusion. Pericardial fluid cytology confirmed adenocarcinoma TTF1 positive. Multi-organ metastatic disease was diagnosed (bone, lung and thyroid) without EGFR mutation or ALK-EML4 translocation. Four cycles of chemotherapy with pemetrexed and carboplatin were done. She started with refractory headache and vomiting, brain CT and MRI showed no evidence of metastasis, a lumbar puncture was able to confirm malignant cells in the cerebrospinal fluid. A BRAF V600E was detected by NGS, Ion Torrent PGM technology in the initial tumor sample and in plasma circulating free DNA. An off-label treatment with vemurafenib 960 mg q12h was offered to the patient, with clinical improvement and radiologic lung stability. At month 2 of treatment, the patient developed respiratory insufficiency with thorax CT revealing ground-glass opacities, in context of pneumonitis. Influenza A virus was identified. Vemurafenib was suspended with radiologic improvement, re-introduced until 720 mg q12h and maintained until disease progression (large volume pleural effusion with positive cytology), at month 6 of vemurafenib's treatment. Third line treatment is being planned.
Discussion: The application of next generation sequencing to the tumor and plasma circulating free DNA allowed the detection of a BRAF-V600E mutation. The improvement of neurologic symptoms and disease control achieved with vemurafenib supports its efficacy. Subacute pneumonitis is a possible adverse event that should considered.

Key words: *Vemurafenib. BRAF mutation. BRAF-V600E. Lung cancer.*

CO-027. EGFR MUTATION WITH NO RESPONSIVENESS TO ERLOTINIB

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Introduction: Mutations in the EGFR gene are observed in 5-20% of non-small-cell lung cancer (NSCLC). They're more frequent in nonsmokers, women and Asians. These mutations can occur in exon 18, 19, 20 or 21. Those in exon 19 and 21 are termed classical mutations (constitute 90% of the cases), being associated to a better response to the treatment with tyrosine kinase inhibitors (TKI).
Case reports: Case: 1: female, 31 years old, nonsmoker, housekeeper, who went to the Emergency Room (E.R.) because of dyspnea on exertion of sudden onset associated to bilateral omalgia, anterior thoracalgia and low back pain with 1 month of evolution, partially relieving with analgesics and rest. She also referred nonproductive cough. Objectively in the E.R.: SatO2 94% (FiO2 21%), marked scoliosis and bibasal diminished breath sounds at pulmonary auscultation. Analytically increase of inflammatory parameters. Chest radiography with bilateral pleural fluid and reticular pattern. CT-angiography showing a mass at the posterior segment of the right inferior lobe and several mediastinal lymphadenopathies. Abdominal and pelvic CT scan showed liver, adrenal glands, ovaries and pleural metastases. Brain and spine MRI showed brain and bone metastases, with pathological fractures. Bronchofibroscopy showed mucosal edema at the posterior basal segment, and the histology revealed slightly differentiated adenorcacinoma, immunohistochemical stains TTF1+, p63-, CK5/6-, with two mutations in exon 18 of EGFR gene. She started holo-cranial and spine palliative radiotherapy, followed by Erlotinib administration. There was a progressive deterioration of her clinical state and she ended dieing after 2 months. Case 2: male, 33 years old, smoker (34 pack-years), construction worker, referred to the Pulmonology consultation to determine the origin of metastatic adenocarcinoma diagnosed in a subcutaneous scapular node biopsy. He also referred a weight loss of 15 kg in 4 months, anorexia, easy tiredness and right omalgia with 1 month of evolution. Objectively: clubbing of the nails, SatO2 89% (FiO2 21%), diminished breath sounds globally and exaggerated at the middle third of the left lung at pulmonary auscultation, painful cervical lymphadenopathy. From all the study it's important to emphasise: bronchofibroscopy showing direct signs of cancer, with total occlusion of the right superior lobar bronchus; transbronchial biopsy revealed adenocarcinoma, compatible with lung origin, TTF1+, CK7+, CK20-, p63-, and it was identified a deletion mutation in exon 19 of EGFR gene; neck, thoracic, abdominal and pelvic CT scan showed metastases at the lung, liver, adrenal gland, bone, muscles and cervical lymph nodes, and brain MRI showed brain metastases. He started holo-cranial palliative radiotherapy, followed by Erlotinib administration. There was a clinical and radiological worsening, and he died after 1 month.
Discussion: In patients with NSCLC it's important to consider a genetic assessment of EGFR mutational status as part of a personalized therapy. However, it's also important to take into

account that there are several clinical and molecular factors that have been associated with sensitivity or resistance to TKI, and the presence of these mutations isn't always associated with an increased sensitivity and response to this treatment (rarely happening in classical EGFR mutations), as showed by these clinical cases.

Key words: *EGFR gene. Mutations. Non-small-cell lung cancer. Tyrosine kinase inhibitors.*

CO-028. SECOND-LINE CHEMOTHERAPY FOR ADVANCED NON-SMALL-CELL LUNG CANCER WITH WEEKLY DOCETAXEL

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Introduction: Second-line single-agent docetaxel showed superiority in overall survival compared with best supportive care alone in previously treated patients with non-small cell lung cancer (NSCLC). However, for PS = 2 or PS = 1 with important toxicities in previous line, chemotherapy is associated with greater toxicity and less benefit, and the efficacy of salvage docetaxel chemotherapy for these patients is still controversial. Therefore, we evaluated the efficacy and toxicity profiles of weekly low-dose docetaxel regimen administered in daily clinical practice for PS = 2 or PS = 1 patients with important toxicities previously exposed to chemotherapy.
Methods: Between January 2014 and December 2015, 24 patients with stage IV NSCLC, 19 (79.2%) male, 13 (54.2%) smokers and 10 (41.7%) former smokers, 9 (37.5%) squamous cell carcinoma, 13 (54.2%) adenocarcinoma, 1 (4.2%) large cell carcinoma and 1 (4.2%) adenosquamous previously treated with one chemotherapy regimen, received docetaxel as single-agent salvage chemotherapy. All patients were an ECOG performance status of grade 2 or grade 1 with important toxicities in previous line. Docetaxel was administered at a dose of 35 mg/m^2, days 1 and 8 each 21 day cycle, in an outpatient setting.
Results: Mean age was 61.5 years (range 34 to 74). Previous duplet with platinum and a third generation drug (pemetrexed, vinorelbine, gemcitabine or paclitaxel) was done. In second line a median of 4 cycles (range 1 to 4) were administered and of 24 patients enrolled, 5 patients (20.8%) showed partial responses,10 patients (41.7%) showed stable disease and 9 (37.5%) progressive disease. Grade 3/4 toxicities with docetaxel were: anemia in 37.5% of patients, anorexia in 16.7%, diarrhea in 12.5%, neutropenia in 50% and peripheral neuropathy in 20.8%. Drug toxicity was the reason for the treatment discontinuation in 3 patients (12.5%). At median follow-up of 6 months only 5 patients are alive. Median progression-free survival and overall survival were 14 weeks (95%CI: 11.6-16.4) and 37 weeks (95%CI: 27.0-46.9), respectively.
Conclusions: Weekly low-dose docetaxel appears to be tolerate as salvage chemotherapy for previously treated patients with NSCLC. The efficacy of this low-dose regimen seems to be comparable to the standard 3-week docetaxel regimen. This approach provides a reasonable alternative for pretreated patients with PS 1 with important toxicities or some PS = 2 patients NSCLC.

Key words: *Advanced NSCLC. Docetaxel. Toxicity. Efficacy.*

CO-029. IMMUNOTHERAPY IN NON-SMALL CELL LUNG CANCER: A PULMONOLOGY DEPARTMENT EXPERIENCE

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Introduction: Effective options are limited for patients with non-small cell lung cancer (NSCLC) with progressive disease after first-line chemotherapy. In these patients, immune checkpoint modulators have recently proven to be successful targets, being nivolumab the first immune checkpoint inhibitor approved for NSCLC. In contrast to conventional chemotherapy, these agents appear to have potential for effecting durable responses and possibly long-term survival. Immune checkpoint inhibitors generate atypical types of tumour responses and have a specific toxicity profile which is challenging current practices.
Objectives: To investigate outcomes and adverse effects in patients treated with nivolumab.
Methods: Stage IV and IIIB NSCLC patients treated with nivolumab at our centre between 30th September 2015 and 30th June 2016 were retrospectively analysed. We describe clinical features, toxicity and outcomes in these patients.
Results: Fifteen patients were included [mean age 62 ± 8 years; mainly male (n = 12)]. Almost all patients had a history of tobacco smoking (n = 12; mean pack/year 45). The observed histological type were adenocarcinoma (n = 10) and squamous cell carcinoma (n = 5). All patients received prior systemic therapy with platinum based regimens. At time of the initiation of nivolumab most patients had an ECOG performance-status score of 1 (n = 12) and stage IV cancer (n = 10). Only one patient received subsequent cancer therapy; the remaining alive patients at time of the study was still under nivolumab treatment. Mean duration of treatment was 3.5 months (median of 4 cycles). The median survival since the beginning of nivolumab was 2.3 months (min 7 days; max 8.7 months). Treatment-related adverse events of grade 1 or 2 were reported in 20% of the patients: thyroid hormone alterations were present in 3 patients and 2 needed thyroid hormone replacement; 1 patient presented immune related eczema and another suspected myocarditis. Two patients suspended nivolumab temporarily and two patients died.
Conclusions: Besides the efficacy profile of immune targeted agents it is important to be aware of possible immune-related adverse events. These toxicities remain largely unknown and will be more frequent in routine practice as the number of patients treated with nivolumab increases. Although severe adverse effects remain rare, they can become life-threatening if not anticipated and managed appropriately. Ongoing evaluation is needed to define the most appropriate timing and patient population that will benefit from therapy with an immune checkpoint inhibitors and to learn how to deal with its adverse effects.

Key words: *Lung cancer. Immunotherapy.*

CO-030. LUNG TUMOUR. A 6-YEAR CASELOAD FROM A SPECIALIZED TERTIARY CENTER

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Introduction: Worldwide, lung cancer is currently the tumor with the highest incidence and mortality rate in men and second highest mortality rate in women, only behind breast cancer. Its incidence in women has increased significantly in the recent years. Unfortunately, only 20% of the cases are diagnosed in the early stages, precluding curative treatment.
Methods: Retrospective study including patients admitted at our Department over a six-year period (2010-2015). Clinical, demographic and overall survival (OS) were retrieved and analysed. Mesothelioma patients were excluded.
Results: From January 2010 to September 2015, 635 patients were diagnosed with lung tumors, with a male preponderance (71.3%; 453 patients). Average age was 66 years (22-89), and 56.7% patients had more than 65 years. From this group of patients, only 1.6% had benign lesions. According to 2004 WHO classification, the most common histological type was adenocarcinoma (57%), followed by squamous cell carcinoma (21.8%); large cell carcinoma and

bronquioalveolar carcinoma were diagnosed in 2.1% and 1% patients, respectively carcinoid tumors and neuroendocrine carcinoma were diagnosed in 4.6% and 2.6%, respectively. Small cell lung cancer was diagnosed in 9.3% patients. Pleomorphic tumor (5 patients), pulmonary lymphoma (2), pulmonary epithelioid hemangioendothelioma (2), mucoepidermoid carcinoma (1) and adenoid cystic carcinoma (1) were rare findings. Almost 10% of patients had a previous malignant tumour (head and neck cancer was the most frequent). At diagnosis, 51.7% of patients were diagnosed in stage IV, 11.2% presented stage IIIB, 13% presented stage IIIA, 5.9% patients had stage II disease and 16.5% presented at stage I (AJCC 7th edition). Eleven patients were not able to complete staging procedures. Patients were either submitted to surgery (21.1%), chemoradiotherapy (10.7%) or systemic therapy with chemotherapy/TKI (47.4%) – palliative (32.5%), definitive (11.4%) and adjuvant (3.5%). Palliative radiotherapy was performed in 21.6% patients, while 2.1% had definitive radiotherapy. Best supportive care was the treatment of choice in 11.7%. Chemotherapy with a platinum-doublet was the treatment for patients with disseminated disease (36.5%). Cisplatin plus cisplatin was the most commonly used. Single-organ metastatic disease was present in 53.9%, being the bone, the central nervous system and the lungs the most affected with 14.6%, 12.4% and 9.6%, respectively. Metastasis with multiple organ involvement was diagnosed in 12.7%. Global median OS survival was 11 months, while median OS for metastasized patients was only 6 months.
Conclusions: Lung cancer was more frequently diagnosed in male patients, representing almost 75% of our population. Adenocarcinoma was the most common histological subtype. More than 50% had disseminated disease at diagnosis and less than 22% were diagnosed at early stages. Due to the fact 10% of the patients had previously another cancer diagnosis, maybe allowed for an earlier diagnosis and treatment of lung cancer. Stage IV overall survival is poor, highlighting the need for better local and systemic therapies.

Key words: *Lung cancer.*

CO-031. ADVANCED STAGE LUNG CANCER

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Introduction: Patients with lung cancer (LC) are usually diagnosed on advanced stages. Our goal was to know the main differences between patients with stage IV LC at diagnosis regarding the others and evaluate which factors are related to an unfavourable follow-up.
Methods: Retrospective series of hospitalary origin of 390 patients with initial diagnosis of LC (2006-2010). Two groups (M1 vs M0). Follow-up until June 2015 conducting a comparative study between M0 and M1 patients and uni and multivariate survival study on M1 patients.
Results: 172 (44.1%) M1 stage patients. Main metastasis locations: sole lung (18.5%), multiple lung (36.6%), bone (23.1%), CNS (11.6%), pleura (17.4%), liver (14.5%), adrenal (9.8%), lymph nodes (9.8%) and other (11%). 58.1% had just one location, 29.7% two and 12.2% tree or more. Presence of metastasis associated to: younger age (64.9% ± 10.5 vs 68% ± 9.6; p = 0.05), female sex (73.5% vs 41.3%; p < 0.05), loss of appetite (52.9% vs 41.1%; p = 0.03), absence of comorbidities (55.3% vs 41%; p = 0.02), absence of respiratory disease (52.8% vs 33.1%; p < 0.005), patients without COPD (52.5% vs 33.3%; p < 0.005), non smokers (69.2% vs 42.3%; p = 0.008), pleural effusion presence (64.8% vs 35.2%; p < 0.005), advanced T stage (p = 0.007) and N2-3 vs N0-1 (50.4% vs 34.4%; p = 0.02). There were significant differences between survival between each group (M1: 7 months; IC95% 5.4-8.5 vs M0: 10 months; IC95% 7.2-12.7 - p < 0.005), with survival of M1 patients at 3, 6, 12 and 24 months of 67%, 56%, 30% and 8% respectively. M1 survival was associated with: female sex (10 months; IC95% 5.1-14.8 vs 6 months; IC95% 4.3-7.6 - p = 0.05), weight loss (4 months; IC95% 2.4-5.5 vs 8 months; IC95% 6.4-9.5 - p = 0.014), asthenia (5 months; IC95% 1.9-8 vs 8 months; IC95% 6.3-9.6 - p = 0.006), loss of appetite (2 months; IC95% 0.2-3.7 vs 8 months; IC95% 6.4-9.5 - p = 0.0005), smoking (6 months; IC95% 4.4-7.5 vs 12 months; IC95% 5.3-22.3 - p = 0.019), initial thorax X-Ray (lung nodule: median 15 months; IC95% 8.4-21.5 vs lung mass: 7 months; IC95% 5-8.8 - p = 0.002), pleural effusion (6 months; IC95% 3.5-8.4 vs 8 months; 5.9-10 - p = 0.007) and patients without active oncologic treatment (2 months; IC95% 0.6-3.3 vs 8 months; IC95% 6.5-9.4 - p = 0.05). It was associated with worse survival on the multivariate analysis: weight loss (OR 1.3; IC95% 0.96-1.89), smoking (OR 1.34; IC95% 0.92-2.53), anaemia (OR 1.36; IC95% 0.99-1.8) and not initiating an active oncologic treatment (OR 2.31; IC95% 1.40-3.82).
Conclusions: In our experience, 44.2% of patients were at a stage IV disease at diagnosis. Global survival rate on this group is very poor with survival at one year of 30%. The main predictors of survival at diagnosis were related to the patients' general situation and mainly with initiating an active oncologic treatment.

Key words: *Lung cancer.*

CO-032. LUNG CANCER – THREE YEARS' EXPERIENCE FROM A SPECIALIZED ONCOLOGY CENTER

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Introduction: Lung cancer is the leading cause of cancer-related death in both genders. The World Health Organisation estimates that lung cancer deaths will continue to rise, largely as a result of an increase in global tobacco use. Smoking cessation, healthy habits and early diagnosis may improve the prognosis of patients. With the introduction of immunotherapy, metastatic disease can be better managed and overall survival might not be so disappointing.
Methods: Patients diagnosed with lung cancer at our Department over a three-year period (2010-2012) were included. Clinical and demographic data was retrieved and analysed. Median and 5-year overall survivals (OS) were calculated.
Results: A total of 253 patients were diagnosed with lung tumors, with male preponderance (72.4%; 184 patients). Average age was 63.7 years (± 11.6) (22-89 years), and 19% patients had more than 75 years. According to the 2004 WHO classification, the most common histological type was adenocarcinoma (53.8%), followed by squamous cell carcinoma (23.3%). Carcinoid tumors and neuroendocrine carcinomas comprised 8.3% and 2.8% of total cases, respectively. Large cell carcinoma and bronquioalveolar carcinoma accounted for 1.2% each. Small cell lung cancer was the diagnosis in 21% of the patients. Pleomorphic tumors (2 patients) and pulmonary lymphoma (1) were rare findings. At the time of diagnosis, 51% of patients had stage IV disease, 10.3% presented at stage IIIB, while 13.4% were at stage IIIA. Unfortunately, only 3.7% patients had stage II disease and 18.2% presented at stage I (AJCC 7th edition). Two patients were not able to complete staging procedures. Patients were submitted to surgery (23.7%), chemoradiotherapy (9.1%) or systemic therapy with chemotherapy/tyrosine kinase inhibitors (50.9%). Chemotherapy was palliative in 32.8% of cases, definitive in 13.8% and adjuvant in 4.3%. Palliative radiotherapy was performed in 13.4% patients, while 2% had definitive radiotherapy. Best supportive care was the treatment of choice in 11.1%. Chemotherapy with a platinum-doublet was the treatment for patients with disseminated disease (45.6%). Pemetrexed plus cisplatin was the most commonly used. Single-

organ metastatic disease was present in 62.5%. The lungs, bone and central nervous system were the most common locations with 14.1%, 13.2% and 11.7%, respectively. Multiple organ involvement was diagnosed in 7%. Number of metastasis and its location does not influence OS (p = 0.078, p = 0.564), respectively. For initial stage, median OS was not reached, with 5-year OS of 55.1%. For locally advanced stage, median OS was 11 months, while 5-year OS of 10%. For patients with metastasized disease, median OS was 5 months and 5-year OS was 2.3%.
Conclusions: Lung cancer is more common in male patients, affecting older patients in almost 20%. More than half had metastasized disease and about 11% were only eligible for best supportive care. Early stages showed good survival rates, while disseminated disease had a dismal prognosis. Number of metastasis and its location did not influence OS.

Key words: *Lung cancer. Therapy.*

CO-033. COMORBIDITIES IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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Introduction: COPD frequently coexist with several comorbidities. These could be caused by the same risk factor (tobacco smoking), could be a direct cause of COPD or secondary to the chronic systemic inflammation that exists in this disease. The acknowledgement of these comorbidities in an older population is important because these comorbidities are associated with a decreased in quality of life, with a higher number of exacerbations of COPD and with an increased in mortality. The objective of this study was to determine the prevalence of the different comorbidities and the cause of hospitalization of the patients with COPD in Garcia de Orta's hospital (HGO).
Methods: Observational study, descriptive, transversal, with the patients hospitalized in the departments of Pneumology and Internal Medicine in the first 6 months of 2016. The patients were selected in this period with the diagnostics according to ICD-9: 491 (Chronic bronchitis) and 492 (Emphysema). The inclusion criteria were: men and women over 40 years old, diagnostic of COPD according to the GOLD document of 2016, the availability of a complete record file and the existence of respiratory function tests. Variables collected were: age, gender, smoking history, respiratory function tests, cause of hospitalization. The comorbidities were grouped in Cardiovascular, Respiratory, Metabolic, Oncology, Gastrointestinal and Neurological/Psychiatric.
Results: From the 244 patients analyzed, 39 patients (n) met all the inclusion criteria. 35 (89.7%) were men and 4 (10.3%) were women, with a mean age of 70 ± 10 years, ranging from 45 to 89 years old. 35.9% of the patients had 3 to 4 comorbidities, 30.8% 1 to 2 comorbidities, 15.4% more than 6 and only 7% of the patients didn't have any comorbidities associated with COPD. The most frequent comorbidities in both genders were the Cardiovascular (76.9%) in particular arterial hypertension (61.5%), cardiac failure (30,8%) and arrhythmias (23.1%). The metabolic comorbidities were the second most frequent (48.7%) with dyslipidemia being the most frequent (28.2%), followed by diabetes (23.1%). The respiratory comorbidities were the third most common, followed by the Gastrointestinal, Neurological/Psychiatric and Oncology. 88.6% of the patients had smoking history. The main cause of hospitalization was the infectious exacerbation of COPD (66.7%), followed by cardiovascular disease (17.9%). The prevalence of the comorbidities according to the level of bronchial obstruction (post bronchodilator FEV1) was 9.1% in mild obstruction, followed by 33.3% in moderate obstruction, 48.5% in severe. And 9.1% in very severe obstruction.
Conclusions: It was concluded that 92.3% of the studied population had at least one comorbidity associated to COPD, and that the main comorbidity was cardiovascular (arterial hypertension). More than half of the patients were hospitalized because of infectious exacerbations of COPD, followed by cardiovascular disease. It was also concluded that the prevalence of the comorbidities increased with the level of bronchial obstruction, however it was observed a decrease of the comorbidities in very severe obstruction.

Key words: *COPD. Comorbidities. Bronchial obstruction.*

CO-034. PREDICTIVE MORTALITY FACTORS IN ACUTE EXACERBATION OF COPD

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Introduction: In 2020, the chronic obstructive pulmonary disease (COPD) will be the 3rd most common cause of death worldwide. It is associated with multiple co-morbidities that contribute to increase its severity. The occurrence of exacerbations is also associated with worsening of the disease and decline in respiratory function. Therefore, COPD exacerbations and co -morbidities should be actively investigated and treated.
Objectives: Evaluation of severity and co-morbidities of patients hospitalized for acute exacerbation of COPD (AEDPOC); Identifying predictors of mortality.
Methods: Retrospective analysis of medical records of patients admitted for AEDPOC in Pneumology B Unit between January 2014 and December 2015. Demographic, functional and clinical data were analysed. Statistical analysis was performed using the statistical program SPSS v.20 IBM and Microsoft Excel®.
Results: Study included 122 patients (80.3% male), aged between 41 and 93 years and 68% had a history of smoking. The average hospital stay was 10.6 days. 82.8% of exacerbations were of infectious etiology, which resulted in 9 deaths (7.4%). The average number of exacerbations and severe exacerbations per patient in the previous year was 1.5 and 0.5, respectively. Among the 122 patients, 4 (3.3%) had COPD group A, 26 (21.3%) group B, 13 (10.6%) group C and 79 (64.7%) group D. Regarding the stabilised blood gas parameters, average values for pH of 7.42, pCO2 of 45 mmHg, pO2 of 70.6mmHg and pO2/FiO2 of 319 were detected. The most common co-morbidities were hypertension (60.7%), heart failure (HF) (54.9%), depressive syndrome/anxiety (34.4%), emphysema (32.8%), atrial fibrillation (AF) (32.8%), diabetes mellitus (DM) (19.7%), bronchiectasis (14.8%), OSA (12.3%) and ischemic heart disease (11.2%). 59.1% of patients were under home oxygen therapy and 47.5% under ventilotherapy, while 1.6% required invasive mechanical ventilation (IMV) last year. There were statistically significant differences between age, the number of severe exacerbations in the last year and a smoking history of patients who survived, compared to deceased patients (Mann-Whitney test, p = 0.049, p = 0.031 and p < 0.001, respectively). There were no statistically significant differences in the FEV1 and stabilised blood gas parameters (pH, pCO2, pO2, pO2/FiO2) (Mann-Whitney test, p > 0.05). Statistically significant associations were found between the need to IMV last year, domiciliary ventilotherapy, presence of emphysema, OSA, HF and AF of patients who survived, compared to deceased patients (Fisher's exact test, p = 0.004, p = 0.014, p = 0.009, p = 0.027, p = 0.004, p = 0.007, respectively).
Conclusions: The majority of patients hospitalized for AEDPOC were men and the most common co-morbidities were hypertension and heart failure. Exacerbations were mainly due to respiratory infection. The number of severe exacerbations in the previous year, age, smoking history, need of IMV in the last year, domiciliary ventilotherapy, emphysema, OSA, HF and AF were predictors of mortality in our sample.

Key words: *COPD. Exacerbation. Mortality.*

CO-035. CARDIOPULMONARY EXERCISE TESTING – A PNEUMOLOGY SERVICE EXPERIENCE

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Introduction: Cardiopulmonary exercise testing (CPET) is considered the gold standard exercise test on evaluation of the causes of intolerance to stress. Its usefulness is still visible in other situations, currently used as a fundamental examination on the evaluation of the patient, the patient's surgical and cardio respiratory and the athlete. This assessment involves the integration of physiological data of cardiocirculatory and respiratory, metabolic nature, becoming a common exam to various medical specialties. In its execution, the presence of a technician of cardiopneumology and a doctor is essential.
Objectives: To present the material in a Pneumology Service about the CPET.
Methods: The authors performed a retrospective analysis of the CPET conducted between May 2012 and June 2016 in Hospital Beatriz Ângelo. The evidence was held in electric equipment, Mortara, following a progressive incremental Protocol up to a maximum supported by sick or termination according to medical indication.
Results: 337 CPET were held. 52% of the patients were male and the average age was 49.7 ± 18.6 years. 50.6% of the patients were smokers or ex-smokers with a smoking burden 47.3 ± average 30.6 units Pack-year. In most cases (64.3%), CPET was held for evaluation of intolerance to stress. Other reasons were the cardiorespiratory assessment of patients referred to the respiratory rehabilitation program (24%), pre-operative assessment (10.4%), pulmonary hypertension (1%) and investigation of desaturation in the effort (0.3%). The factors impeding the effort more frequent were respiratory pathology (22.1%), deconditioning (20.5%), cardiocirculatory pathology (16.9%), obesity (4.9%), hyperventilation disproportionate/ventilation inefficiency (3.2%) anemia (1%) and neuromuscular pathology (0.6%). In 37.3% of the cases, the cardiorespiratory assessment was normal. Of the patients referred for preoperative evaluation (n = 32), 81.3% were pulmonary resection surgery candidates and the rest to other major surgeries. In 18.7% of cases, evidence pointed out high risk for post-operative complications.
Conclusions: The respiratory medicine is a specialty intervener in the assessment of patients-target the CPET. Therefore, a pulmonary function laboratory, should include, in addition to the functional respiratory tests at rest, and testing methodologies that allow to obtain the patient's assessment during the effort. This information contributes to greater accuracy in the diagnosis of pulmonary pathologies and their differential diagnoses, as well as for guidance on therapeutic strategy.

Key words: *CPET. Exercise.*

CO-036. GOLD. GLOBAL DEFINITION FOR A HETEROGENEOUS DISEASE

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Introduction: The Global Initiative for Chronic Obstructive Lung Disease (GOLD) characterizes this disease as an irreversible and progressive limitation of the airways associated with chronic inflammation of the same in response to toxic particles. Diagnosis is spirometric (FEV1/FVC < 0.70 post bronchodilator) in the presence of respiratory symptoms. Few studies have been published on the prevalence, distribution and interrelationship of functional imaging and hemodynamic changes as well as comorbidities analysis in patients diagnosed with COPD.
Objectives: Epidemiological, functional and imaging characterization of GOLD groups and analysis some of the main comorbidities associated with COPD.
Methods: Retrospective and comparative study. Multivariate analysis of patients diagnosed with COPD followed in our Hospital Unit of Pneumology appointment in 2015/2016, divided into 4 groups according to the classes of 2016 GOLD (A, B, C and D). Excluding the patients in the clinical process not see covered in the supplementary examinations necessary for the evaluation of the defined variables. Analyzed variables: Imaging: CT Thorax; Functional: DLCO and Residual Volume (RV); Hemodynamics: Pulmonary hypertension (HTP); Biometrics: Body Mass Index (BMI); Morbidities: Syndrome Obstructive Sleep Apnea (OSA) and cardiovascular disease
Results: 94 patients were included: 23 in Group A, 25 in group B, 21 C and 25 group in Group D. male gender predominance in all groups. Group A are younger (67.6 ± 12.6 years; $p < 0.05$). BMI lower in group D (24.2 ± 3.9 kg/m^2), all others with mean BMI > 25 (overweight). Functionally, VR Group D (191 ± 45.4%; $p < 0.05$) despite significant hyperinflation in group A. DLCO/VA in C group was 95.3 ± 33.1 vs 55 ± 35.2% in the group D. In the echocardiogram, 40% of Group B patients and 28% of group D had pulmonary hypertension. More than 50% of group A showed TB sequelae with traction bronchiectasis on CT chest, while in group D predominated centrilobular emphysema (64%). Cardiovascular morbidities were more prevalent in the group B (25%) and D (43%), especially hypertension and atrial fibrillation. Diagnosis of OSAS in 32% of Group B ($p < 0.05$).
Conclusions: In our sample, more than half of the Group A patients showed TB sequelae with traction bronchiectasis in CT Thorax. Physiopathologically patients with fibroresiduais changes resulting from tuberculous infection have different functional decline compare with emphysematous patient. Is GOLD including different phenotypes or different diseases? In group B, a significant fraction of our patients already had HTP. Cardiovascular comorbidities and OSA were also more prevalent in this group. Hypopneas and apneas night undiagnosed and thromboembolic phenomena can be important causes of mortality in this group. There is some controversy in the literature about the severity of the Group C compared to group B. Patients in group C analyzed in our study despite severe obstruction grade showed preserved DLCO. There will be in this group inflammation of the airways with less associated alveolar damage? The results obtained in Group D were perhaps the most consensus. Tobacco as the dominant cause, consequent development of centrilobular emphysema and important functional reduction: reduced DLCO and hyperinflation.

Key words: *GOLD. Phenotypes. Comorbidities. Multivariate analysis.*

CO-037. DOES LOWER AIRWAY PATENCY INFLUENCE NASAL FUNCTION? A STUDY IN SCHOOL-AGED CHILDREN

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Introduction: Allergic rhinitis is the most common comorbid condition in patients with asthma. Lack of rhinitis control significantly increases the likelihood of worse quality of life in asthmatics and loss of asthma control. Peak nasal inspiratory flow

(PNIF) is a simple and validated measure of nasal function, useful for the objective evaluation of rhinitis and its control. However, the impact of lower airway patency on PNIF should be considered. This has not yet been analyzed across the school age range.
Objectives: To study the association between PNIF and lower airway patency in children aged 6 to 12 years-old, with and without rhinitis and asthma.
Methods: Cross-sectional study of 104 children (56% male; mean age 9.5 years standard deviation 2.0); 69% had rhinitis and 63% had asthma. Upper airway patency was assessed by PNIF, before and after bilateral topical nasal phenylephrine chlorhydrate at 2.5 mg/ml, and lower airway patency by spirometry, before and after 400 μg inhaled salbutamol. Associations were investigated by multiple linear regression models.
Results: Post alpha-agonist PNIF was significantly associated with post-beta2 forced expiratory volume in one second (FEV_1) ($r = 0.541$, $p < 0.001$) and peak expiratory flow (PEF) ($r = 0.565$, $p < 0.001$). Adjusting the models for gender and age, the estimated change in post alpha-agonist PNIF per 1 L increase in post-beta2 FEV_1 or 1 L/s increase in PEF (beta-coefficients) were 26.21 L/s (95% confidence interval (CI) 10.27-42.15, adjusted $r^2 = 0.325$, $p < 0.001$) and 15.77 L/s (95%CI 8.26-23.27, adjusted $r^2 = 0.364$, $p < 0.001$), respectively. Baseline values of PNIF were also significantly associated with FEV_1 (beta-coefficient 16.65 L/s; 95%CI 5.47-27.82, adjusted $r^2 = 0.108$, $p = 0.001$) and PEF (beta-coefficient 9.82 L/s; 95%CI 4.81-14.83, adjusted $r^2 = 0.16$, $p < 0.001$). The associations between PNIF and FEV_1 or PEF were independent of rhinitis and asthma diagnosis, and of nasal or inhaled corticosteroid use. No significant associations were found between PNIF and FEV_1 z scores. However, a correlation was found between PNIF and PEF z scores ($r = 0.259$, $p = 0.008$). There was no association between reversibility of the upper and lower airways.
Conclusions: We describe, for the first time to our knowledge, a consistent and independent correlation between PNIF and lower airway patency measures in school-aged children. In order to assess nasal obstruction by means of PNIF, it may be important to consider at least PEF values. Lung function assessment is particularly useful in case of low PNIF values to exclude a reduction in lower airway patency. The association between upper and lower airway patency may reflect a physiologic background for the common asthma-rhinitis comorbidity.

Key words: *Asthma. Peak Nasal Inspiratory Flow. Respiratory Function Tests. Rhinitis.*

CO-038. AMBULATORY OXYGEN PRESCRIPTION IN PULMONARY REHABILITATION PROGRAMMES

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Introduction: The Portuguese clinical guideline issued by the General Health Direction (DGS 018/2011) establishes the criteria for ambulatory oxygen (AO) prescription as follows: 1) patients with long term oxygen therapy (LTOT) and 2) normoxemic patients at rest, showing peripheral oxygen saturation (SpO2) below 88% during a 6MWT or a 4% reduction to values below 90%, if corrected by supplementary oxygen provision. Despite the present clinical guideline, current evidence to guide the selection and the AO adaptation methodology is scarce.
Objectives: To analyze the treatment options in patients with oxygen desaturation during the six-minute walk test (6MWT).
Methods: Retrospective study with 90 patients enrolled in Pulmonary Rehabilitation Programme (PRP) from june 2015 to june 2016. 32 patients with 6MWT desaturation at the beginning of the PRP were included and 13 patients were excluded: 3 dropped out of the programme and 10 already used AO when they started the programme.
Results: The 32 eligible patients presented a mean age of 66.6 ± 12.6 years, 18 were male (56.3%). The most frequent pathologies were COPD (10 patients) and Interstitial Lung Diseases (7 patients). The pH, PaO_2 and $PaCO_2$ mean values at start were 7.43 ± 0.02, 69.3 ± 8.2 and 41.3 ± 5.1 mmHg respectively. 3 patients were previously on LTOT and 9 were on domiciliary non-invasive ventilation (3 BiPAP and 6 CPAP). Initial mean values of walking distance on the 6MWT were 359.8 ± 97.8 meters (0.3 ± 0.7 stops), mean SpO2 85.6 ± 4.0%, minimum SpO2 80.5 ± 6.8% and mean desaturation time below 88% of 3.3 ± 2.3 minutes. Results of the 6MWT made without supplementary oxygen and after physiotherapy techniques included in the PRP (energy conservation, airway clearance, exercise training, peripheral muscle training) in 29 patients were: mean walking distance 370.7 ± 107.5 meters (0.1 ± 0.3 stops), mean SpO2 89.6 ± 3.8%, minimum SpO2 86.1 ± 4.9% and mean desaturation time below 88% of 1.7 ± 2.3 minutes. 15 patients had SpO2 above 88%. The patients with AO (n-11) during the 6MWT had a mean walking distance of 368.6 ± 65.8 meters (0 stops), mean SpO2 91.2 ± 1.7% and minimum SpO2 88.6 ± 2.0%. PRP mean duration was 149.2 ± 93.6 days. 23 patients were discharged without AO prescription: 15 without criteria (2 began ventilation therapy/BiPAP); 2 had fire risk (smoking and psychiatric issues); 5 refused AO treatment and one patient who barely left his home, received a prescription for a stationary concentrator to ambulate and exercise at home. Only 9 of the 32 patients, with desaturation on the first 6MWT were discharged with an AO prescription (28.1%): 6 on portable liquid oxygen and 3 on portable oxygen concentrator. One of the 9 patients with AO had nasal symptoms, 2 of them complained about the portable system weight and 5 of them mentioned being embarrassed by AO use outdoors.
Conclusions: Despite the small dimension of the study, results suggest: 1) AO prescription shouldn't be made based on the results of a single 6MWT; 2) PRP could have an impact on exercise desaturation and on AO equipment prescription 3) assessment, adaptation and follow-up of PRP patients with AO therapy need more research.

Key words: *Ambulatory oxygen. Pulmonary rehabilitation programmes. Six minutes walking test.*

CO-039. COPD: DIAGNOSIS OR "LABEL"?

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Introduction: Diagnosis of Chronic Obstructive Pulmonary Disease (COPD) is based on clinical features, risk factors and pulmonary function tests (PFTs) documenting persistent bronchial obstruction. We believe that this diagnosis can sometimes be established in the absence of bronchial obstruction on PFT, based only on symptoms and signs.
Objectives: We aim to assess if patients admitted in an Internal Medicine ward with the diagnosis of COPD have a previous PFT confirming this diagnosis.
Methods: We performed a retrospective study of all patients admitted in an Internal Medicine ward during 2015 with a previous diagnosis of COPD. Data were collected using Cerner Soarian EHR, *Plataforma de Dados de Saúde* and the plethysmograph's database from the Pneumology Procedures Unit of Hospital Professor Doutor Fernando Fonseca E.P.E. Age, sex, previous PRT, outpatient inhaled therapy, previous follow-up by a pulmonologist. Patients without information on all variables were excluded.
Results: Of 118 selected patients, 59 were excluded and 59 included in the analyses. The majority (74.6%) were male, with a median age of 76.5 (standard deviation 9.8 years). Only 50.9% (30) of the patients had a PFT confirming COPD (50% were GOLD 3, 33.3%

GOLD 2, 10% GOLD 1, 6.7% GOLD 4). Surprisingly, 35.6% (21) had a PFT not compatible with this diagnosis: 23.8% had a restrictive pattern, suggesting an alternative diagnosis, and the remaining 76.2% did not had airflow limitation fulfilling GOLD diagnosis criteria. Most of these patients without airflow limitation compatible with GOLD diagnosis criteria had risk factors (90% were smokers, former smokers or had occupational exposure) and performed outpatient inhaled therapy (87.5%).
Conclusions: A significant percentage (35.6%) of patients admitted to an Internal Medicine ward with a previous diagnosis of COPD had a PFT not compatible with this diagnosis: 23.8% of them had a restrictive pattern, suggesting an alternative diagnosis and the remaining 76.2% did not have airflow limitation fulfilling GOLD diagnosis criteria, despite most of them having risk factors (90%) and using outpatient inhaled therapy (87.5%) – some of these patients might have Non-obstructive Chronic Bronchitis, a diagnosis that needs further studies to evaluate the risk of progression to COPD and the benefits of inhaled therapy in patient mortality and quality of life. We emphasize the need of PFTs to establish the COPD diagnosis, to stratify the risk of exacerbations and to determine the most appropriable therapy.

Key words: *COPD. Spirometry. Diagnosis.*

CO-040. PREDICTORS OF MORTALITY IN ACUTE EXACERBATION OF COPD IN PATIENTS REQUIRING NIV

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Introduction: The scientific evidence shows that non-invasive ventilation (NIV) undoubtedly brings benefits in acute exacerbation of COPD (AECOPD). Acute hypercapnic respiratory failure complicates around 20% of AECOPD and NIV is essential to the management of patients with this respiratory disorders. Around 12% of patients with hypercapnic COPD died during the first hospitalization and this increases to 33% if the respiratory acidosis developed after hospitalization.
Objectives: To evaluate the predictors of mortality in AECOPD in patients requiring NIV on admission or during hospitalization, in the Department of Pulmonology.
Methods: Retrospective analysis of medical records of patients admitted in 2014 diagnosed with AECOPD, in which it was held NIV during hospitalization and that have regular follow-up until June 2016. Several clinical parameters were recorded (age, gender, co-morbidities, smoking habits, pulmonary function tests, use of previous domiciliary oxygen therapy and NIV) as well as related hospitalization data (analytic parameters, arterial blood gas values on admission and two hours later, length of hospital stay, previous hospital admissions and re-admissions, therapeutic strategy and mortality in the first two years).
Results: It were included 54 patients (36 male and 18 female) with average age of 71.11 ± 11.6 years. More than half (55.5%) had a history of smoking and 14.8% were active smokers. Forty-seven patients (87%) had one or more co-morbidities. The average value of FEV1 prior to hospitalization was 0.38 ± 0.02. The average blood gas parameters at admission and after two hours were respectively: pO2 70.20/63.75. pCO2 69.34/58.95, pH 7.32/7.38. Mean CRP value was 82.96 ± 10.86) and leukocyte count 12.866 ± 1060). What concerns to prior therapy, 14 patients (37.8%) performed only long-term oxygen therapy, 3 (11.5%) NIV and 23 (42.6%) performed both therapies. The mean length of hospital stay was 13 days ± 6.94. Near half of the patients (46.3%) had a previous hospitalization in the year before and half (50%) were readmitted after the episode of this study. There was a median survival of 21.35 months ± 1.5, with no significant differences between gender. In-hospital mortality rate was 5.6%; at 1 year was 29.6% and at the end of 2nd year was 35.2%. In univariate analysis, there was a statistically significant relationship between patient mortality and the presence of previous hospitalization in the year before ($p = 0.04$; 95%CI 0.045-0.564) or new hospitalization after this episode ($p = 0.037$; 95%CI 0.153-1.637). Mortality was not related with other factors, including age, gender, presence of comorbidities, smoking habits, FEV1, blood gas parameters, analytical parameters and days of hospitalization. In multivariate analysis, only the presence of previous hospitalizations ($HR = 0.160$; HR_a: 0.202; $p = 0.017$; 95%CI 0.054 -0.752) was found to be an independent predictor of mortality.
Conclusions: This sample revealed data coincident with other series of similar significance. A higher prevalence of AECOPD was found in men, smokers and with co-morbidities. Our results suggest that mortality in AECOPD in patients requiring NIV. is associated with the presence of previous hospitalizations, independently of other variables.

Key words: *COPD. NIV. Mortality. Hospitalization.*

CO-041. DIRECT COSTS RELATED TO THE ADMISSIONS OF ADULTS WITH COMMUNITY ACQUIRED PNEUMONIA IN MAINLAND PORTUGAL DURING THE 2000-2009 PERIOD

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Introduction: Admissions of adults with Community Acquired Pneumonia (CAP) in Continental Portugal during the 2000-2009 period accounted for 3,7% of all the admissions registered in this period, with 81 admissions per day, one admission at every 18 minutes, and 16 deaths per day, one death at every 90 minutes. Although with a clinical impact, there is no data on the direct costs of these admissions.
Methods: A retrospective analysis of the data base of the Portuguese Central Administration of the Health System, which contains clinical and administrative information of all the hospital admissions in the National Health Service, was performed. All admissions of adults with a primary discharge diagnosis of pneumonia (encoded as 480-486 and 487 by the International Classification of Diseases, 9th Revision Clinical Modification - ICD-9-CM) between 2000 and 2009 were included. Patients aged under 18 years old were excluded as well as patients in whom pneumonia was not the primary diagnosis and those immunosuppressed, either due to infection by the human immunodeficiency virus (ICD-9-CM: 042-044), immunosuppressive therapies such as antineoplastic (E933.1 code – external cause disease) or post-transplantation (V42). Patients' anonymity was assured during the entire process.
Results: Between 2000 and 2009, 294.026 hospital admissions were analyzed with an overall direct cost of approximately 800 M€. The mean direct cost per admission was 2.706€ which corresponds to a mean daily expense of 218.050€ with a growing trend over the years.
Conclusions: The direct costs related to the admissions of adults with CAP in Continental Portugal during the 2000-2009 period had a high economic impact, accounting for 1 million euros every 4 days and 14 hours.

Key words: *Community Acquired Pneumonia. Costs.*

CO-042. PNEUMONIA DUE TO PNEUMOCYSTIS JIROVECII AND BACTERIAL PNEUMONIA IN HIV-INFECTED PATIENTS: SIMILARITIES AND DIFFERENCES ON PRESENTATION

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Introduction: The approach of the HIV-infected patient with respiratory complaints requires the consideration of a wide range of differential diagnoses, from the most common pathogens to opportunistic infections. Despite *Pneumocystis jirovecii* pneumonia (PCP) had always received the most attention for its high risk of respiratory failure and mortality, bacterial pneumonia becomes increasingly important with the widespread use of antibiotic prophylaxis for opportunistic infections and antiretroviral therapy. Early differentiation between the two entities is critical to successful treatment.
Objectives: To compare the clinical presentation and outcome of PCP and bacterial community acquired pneumonia (CAP) in hospitalized HIV infected-patients.
Methods: We conducted a retrospective analysis of all hospital admissions for PCP and CAP in HIV adults over the last 12 years. Overall, 53 admissions were included (corresponding to 42 patients), 21 for PCP and 32 for PAC. Data regarding epidemiological, demographic, clinical, analytic, radiological and therapeutic aspects were extracted from the clinical records and compared between the two groups.
Results: The group of patients with PCP was characterized by a very late presentation of HIV infection, with very recent or concurrent diagnosis with the PCP event (65% were unaware of HIV infection and none were on antiretroviral therapy). This group also showed a significantly higher proportion of women compared to patients with bacterial CAP (28.6% vs 3.1%, p = 0.0012). The predominant risk category for HIV in PCP group was heterosexual (81%) in contrast to the bacterial CAP group which most were injection drug users (54.8%). Peripheral blood CD4 + T-lymphocyte counts were significantly lower in PCP group (median 29 cells/mm 3 vs 112 cells/mm^3, p = 0.001). The PCP group most often showed an indolent course (symptoms for more than two weeks in 52.4% of cases), whereas 87.5% of bacterial CAP patients presented with an acute illness (p = 0.002). Dyspnea and constitutional symptoms were most frequent complaints in PCP group (p = 0.002 and p = 0.011, respectively). The most common radiological pattern was bilateral alveolar-interstitial infiltrate in PCP group (57.1% of cases) and consolidation in bacterial CAP group (78.1% of cases). Respiratory failure was present 76.2% of patients with PCP against 34.4% of patients with bacterial CAP (p = 0.003). However, there were no differences between the two groups on the need for mechanical ventilation or admission to an intensive care unit. Mortality rate was similar for both groups (9.5% for PCP and 9.4% for bacterial CAP). Nevertheless, the median hospital stay was significantly higher in patients with PCP (22 vs 9 days, p = 0.015).
Conclusions: A thorough anamnesis and simple diagnostic tests such as chest x-ray and ABG may be useful in distinguishing between the PCP and the remaining CAP in HIV patient, guiding the early institution of empirical antibiotic therapy. Despite the typically more severe presentation of PCP, this group revealed no worse prognosis compared to the group of bacterial CAP.

Key words: *Pneumonia. HIV infection. Pneumocystis jirovecii.*

CO-043. FUNGI COLONIZATION AND LOWER LUNG FUNCTION IN CYSTIC FIBROSIS PATIENTS

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Introduction: Fungi colonization is common in patients with cystic fibrosis (CF). Its consequences however are still unclear.
Objectives: Assess if fungi colonization is associated with poorer lung function in CF adult patients.
Methods: We conducted a 1 year retrospective study involving CF adult patients, followed at our department. Clinical files were reviewed in order to collect the data. The patients were divided in 2 groups according to bronchial of fungi colonization. Chronic fungi colonization was defined by the isolation of fungi in more than 50% of sputum samples taken in the previous 12-month period. FEV1, age, genotype, body mass index (BMI), pancreatic insufficiency (PI), and bacterial colonization status, were evaluated. The level of statistical significance considered was $p < 0.05$.
Results: We enrolled 47 patients, 27 were male (57.4%) The median age, the median FEV_1 and the median BMI were 28 years [19;55], 68% [16;106] and 21.9 [15;35.5] respectively. 51% of the patients had exocrine PI and 4.3% had CF related diabetes. *Pseudomonas aeruginosa* (PSAE) bronchial infection was present in 31.9%. Only 21.3% had fungi colonization, either by *Aspergillus* species (12.8%), *Candida* species (6.4%) or both (2.1%). *Aspergillus fumigatus* and *Candida albicans* were the most frequent agents. *Aspergillus flavus*, *Aspergillus niger*, *Candida parapsilosis* and *Candida dubliniensis* were also identified. None of these patients had diagnostic criteria of allergic bronchopulmonary aspergillosis. The group with fungi colonization presented lower FEV_1 and lower BMI than the remaining individuals ($p = 0.035$ and $p = 0.028$ respectively). No statistical differences were found between the two groups regarding age, PI and PSAE infection.
Conclusions: According to the lower FEV_1 and lower BMI, fungi colonization seems to be a marker of greater severity disease. Further longitudinal studies are needed to ascertain whether fungal colonization is a cause or a consequence of greater disease severity.

Key words: *Fungi. Cystic fibrosis. Candida. Aspergillus.*

CO-044. USE OF COTRIMOXAZOL IN MRSA RESPIRATORY INFECTIONS

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Introduction: Cotrimoxazol is an old and low cost antibiotic, with good toxicity profile and good bactericidal activity. It shows *in vitro* activity for methicillin-resistant *Staphylococcus aureus* (MRSA). However, there's limited evidence for clinical efficacy of cotrimoxazol in MRSA respiratory infections.
Objectives: Evaluate the efficacy and safety of cotrimoxazol in MRSA respiratory infections.
Methods: Retrospective study based in the review of clinical files of the patients admitted to Pulmonology Service of General Hospital of University Hospital of Coimbra between 2011 and 2015 with respiratory infections by MRSA, who were treated with cotrimoxazol. Clinical data, demographic data, test results, final diagnosis and outcomes were taken into consideration.
Results: 99 patients had MRSA isolation in respiratory samples and 54 (54,5%) treated with cotrimoxazol. Of these, 69% were male, with a mean age of 76.4 ± 15.1 years. 42,6% were totally dependent on daily routine. Most (90.7%) had a low-intermediate Charlson index (≤ 4). The pathologic background seen with more often was the respiratory disease (68.5%), followed by cardiac disease (44.4%) and cerebrovascular disease (33.3%). The mean length of hospitalization was 33.2 ± 20.0 days. The diagnosis of respiratory infection was based on clinical, analytical and radiological criteria. Most of the isolates was done in sputum culture (79.6%). Polymicrobial infection was found in 24.1% of patients. 44.4% had nosocomial infection, 37.0% infection associated with health care and 18.5% infection acquired in the community. Most patients had a low CPIS, and APACHE II index with mortality risk 15-24%. With regard to therapy, 92.6% patients received initial empiric antibiotic therapy (in order of use: levofloxacin, meropenem and piperacillin-tazobactam). Although in 83.3% that antibiotic therapy was not appropriate to the isolation results. The use of cotrimoxazol (based on microbiologic results) was used in 52% of cases and in combination with other antibiotics in 48% of the cases. Cotrimoxazol

therapy was effective in 57.4% of patients; 24.1% had progression of infection, requiring change in antibiotic therapy, and 18.5% had recurrence of infection after an initial improvement. The effectiveness of cotrimoxazol had only statistically significant differences between age and the status. 29.6% of patients had a fatal outcome, and in 75% of these deaths were attributed to infection by MRSA. There were few side effects during treatment with cotrimoxazol, the most common fungal infection (58.8%). Only in two cases it was necessary to discontinue treatment.
Conclusions: MRSA respiratory infection occurred in the elderly, with a high degree of daily-dependence and was in most cases nosocomial or associated with health care. Our experience shows that cotrimoxazol is moderately effective, but safe in the treatment of respiratory infections by MRSA. The mortality rate of respiratory infections MRSA was high.

Key words: *MRSA respiratory infections. Cotrimoxazol.*

CO-045. CLINICAL SIGNIFICANCE OF POSITIVE *ASPERGILLUS* CULTURE IN RESPIRATORY SAMPLES

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Introduction: *Aspergillus* is an ubiquitous filamentous fungus, thus a positive culture from a respiratory sample of an immunocompetent subject usually represents colonization. The development of *Aspergillus* related disease – Aspergillosis – is linked either to chronic lung diseases, and/or to immunosuppression. Aspergillosis has different types of presentation based on its invasiveness and severity, classically associated to different degrees of immunosuppression. They are defined as Invasive pulmonary aspergillosis (IPA), chronic pulmonary aspergillosis (CPA), aspergilloma and allergic bronchopulmonary aspergillosis.
Objectives: Characterization of a population with cultural respiratory samples positive for *Aspergillus* and identification of risk factors associated with pathology development.
Methods: Retrospective study, with a sample of 61 patients with cultural respiratory samples positive for *Aspergillus*, between October/2013 and June/2016. Data analysed through SPSS-20. Risk was assessed through the presence of chronic lung disease (emphysema/COPD, previous pulmonary tuberculosis, pulmonary embolism thoracic surgery, radiotherapy, pneumoconiosis, sarcoidosis, cystic fibrosis and lung cancer) and the immune status – categorized as normal, minor (diabetes, alcoholism, low-dose corticotherapy, malnutrition and connective tissue diseases) and major (neutropenia, transplantation, high-dose corticotherapy, haematological malignancy, chemotherapy, AIDS and critical patients). It were also registered the different *Aspergillus* species, the time of the year the cultures tested positive and the simultaneous presence of other microorganisms.
Results: From the 61 patients, 38 were male and 23 female, with an average age of 68 years old. Thirty-one patients were immunocompetent, 14 presented a minor grade of immunosuppression and 16 a major grade. No chronic pulmonary disease was documented on 52.2%. *A. fumigatus* was identified on 24.6% of the samples, *A. niger* on 23%, *A. flavus* on 16.4% and the remainder were identified as *A. terreus*, *A. versicolor* e *A. saprophyticus*. In 50.8% other species other than *Aspergillus* were identified, most frequently *Candida albicans* (n = 18). From our sample, 47 positive cultures corresponded to colonization and 14 to disease (aspergilloma n = 2, IPA n = 2 and CPA n = 10). There was statistically significant value in the association between immunosuppression and disease development (p = 0.05; OR = 1:3.4). Similarly positive cultures during the Autumn/Winter period were also associated to disease development (p = 0.03; OR = 1:4.0), compared to the Spring/Summer period.
Conclusions: Only a small portion of the positive cultures corresponded to *Aspergillus*-related disease. Immune status was associated to disease development. It was also observed a relation between positive cultures during the Autumn/Winter period and the development of disease, an association usually not mentioned in literature. On the other hand, previous chronic pulmonary disease, although being a risk factor for colonization, apparently, may be a less preponderant risk factor for disease development.

Key words: *Aspergillus. Colonization. Disease.*

CO-046. VENTILATOR ASSOCIATED PNEUMONIA: A YEAR RESULTS IN INTENSIVE CARE UNIT

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Introduction: The ventilator-associated pneumonia (VAP), defined as pneumonia acquired 48 hours after invasive ventilation, is an important cause of morbidity and mortality in critically ill patients, prolonged hospitalization time and economic costs.
Objectives: Identify cases of VAP in a Polyvalent Intensive Care Unit in a year, analysing the clinical and demographic aspects.
Methods: Retrospective analysis of medical records of patients of the Unidade de Urgência Médica do Hospital de São José diagnosed with VAP during the year of 2015.
Results: Sixty-nine cases of VAP were identified. Most patients (68%) were male with an average age of 62 (± 17) years. About half of patients (48%) had three or more comorbidities, the most common beeing: hypertension (52%), dyslipidemia (36%) and diabetes mellitus (26%). It was found that one-fifth of patients had chronic respiratory disease (COPD, asthma) and 16% had smoking history. The average APACHE II ratio of these patients was 21, the SAPS II 47 and the SAPS III 64. About 83% of patients were hospitalized for 5 days or more and 80% had previous antibiotic treatment. At the time of diagnosis of VAP the patients had an average of 14 days of hospital stay and 10 days of intubation oro or naso-tracheal and invasive mechanical ventilation; 14% had a history of reintubation. In most cases (67%) a single agent was isolated, the most common *Klebsiella pneumoniae* followed by *Pseudomonas aeruginosa*. Most of the isolates (53%) was obtained by tracheobronchial aspirate. In 12% of patients there was progression to ARDS (Acute Respiratory Distress Syndrome); 38% had other associated organ dysfunction (one third of patients with septic shock, 19% with renal impairment in need of renal replacement technique; there was no need for vasopressor support). In 29% there was difficult in ventilation weanning requiring tracheostomy. The mean intra-hospital stay for these patients was 56 days, with a 43% mortality rate.
Conclusions: VAP is one of the most important complications in Intensive Care Units. It was more frequent in patients with 3 or more comorbidities and who had already made prior antibiotic therapy. Its impact is expressed in invasive ventilation time and overall average hospitalisation and particularly in significant morbidity and mortality associated.

Key words: *Ventilator associated pneumonia. Infection. Intensive care. Mechanical ventilation.*

CO-047. INVASIVE PNEUMOCOCCAL DISEASE AND PATIENTS VACCINATION STATUS

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Introduction: According to the Relatório do Observatório Nacional das Doenças Respiratórias Portugal has the 2nd highest pneumonia mortality rate in Europe. Invasive pneumoccocal disease (IPD) is one of the most important causes of this disease leading to a high morbidity and mortality rate. Anti-pneumoccocal vaccination (APV) is, therefore, a preferred method of preventing the disease and could help, in the long run, to change this paradigm.
Objectives: Analysis of cases of IPD, namely, pneumonia, bacteremia and meningitis to Streptococcus Pneumoniae in adults, occurring in Prof. Hospital Dr. Fernando Fonseca in the period from July 2014 to May 2016, particularly, regarding medical complications, ICU hospitalization and mortality rate, comparing them with their vaccination status - APV prior to disease - and their inclusion in risk groups for IPD.
Methods: Observational, retrospective and descriptive study of the clinical records of adult patients with IPD confirmed by bacteriological culture test in sputum, pleural fluid, bronchial secretions, bronchoalveolar lavage and blood cultures occurred in Prof. Hospital Dr. Fernando Fonseca from July 2014 to May 2016. The statistical analysis was performed using Microsoft Excel 2013® program.
Results: The total number of cases in the period from July 2014 to May 2016 was 72, being 49 male. The average age of hospital patients was 62 years (minimum age: 22, maximum age: 86). 68 cases of IPD were pneumonia and 3 meningitis. 25% of cases occurred in patients hospitalized in Pulmonology and 52.8% in Internal Medicine. Microbiological specimens were mostly found in blood cultures (75%). As medical complications, highlights sepsis in 29% of cases and empyema in 14%. 10 patients (14%) were mechanical ventilated, 13 (18%) transferred to ICU. The mortality rate was 14% (n = 10). Of these patients, only 7 (10%) were vaccinated with APV previously to hospitalization, although 44 patients (61%), according to their medical background, belong to risk groups for IPD. It appears that the degree of complications and deaths was higher in the group of unvaccinated patients with DIP (33% with sepsis, 15% of deaths), even in those not belonging to risk groups. The group of patients belonging to risk groups and unvaccinated had the highest mortality rate (16%).
Conclusions: The data analysis shows the high number of medical complications and high mortality rate resulting from the IPD, which increase in unvaccinated patients, even in those not belonging to risk groups. It´s also important to notice the low number of vaccinated patients (only 7 of 44 patients belonging to risk groups) which shows the important work to do both in primary health care and Pneumology for increased vaccination coverage with APV in these patients.

Key words: *Invasive pneumoccocal disease. Anti-pneumoccocal vaccination.*

CO-048. MICROBIOLOGICAL PROFILE OF PNEUMONIA IN A CENTRE OF PNEUMOLOGY. WHAT CAN BE CHANGED?

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Introduction: Pneumonia caused by multidrug-resistant (MDR) pathogens is an emerging problem in health care, with direct implications on morbidity, mortality and costs. The identification of risk factors of the patient and knowledge of the ecology of the institution, as well as local antimicrobial resistance patterns are very important for an adequate empirical antibiotic therapy.
Objectives: Characterize patients with pneumonia caused by MDR microorganisms and by susceptible microorganisms; identification of the risk factors for each group and analysis of survival.
Methods: Retrospective analysis of clinical and analytical data from patients admitted to the Centre of Pneumology of Coimbra University Hospital, between April 2015 and April 2016, with pneumonia and positive microbiological study.
Results: In 78 admissions, 74 MDR pathogens and 20 susceptible pathogens were isolated. Of MDR pathogens identified, 46 (78%) were associated with nosocomial pneumonia (NP) and 13 (22%) with healthcare-associated pneumonia (HCAP). On the other hand, 9 (47.4%) of susceptible microorganisms were isolated in patients with community-acquired pneumonia (CAP), 5 (26.3%) in HCAP and 5 (26.3%) in NP. Comparing the two groups (MDR pathogens *vs* sensitive pathogens), the risk factors most frequently identified were structural pulmonary disease (n = 41; 69.5% vs n = 10; 52.6%); antibiotics in the previous 3 months (n = 25; 42.4% vs n = 6; 31.6%); hospitalization in the previous 3 months (n = 24; 40.7% vs n = 8; 42.1%) and late onset pneumonia (≥ 5 days) (n = 38; 64% vs n = 4; 21.1%). Chronic obstructive pulmonary disease (COPD) was the most common associated lung disease (n = 24; 40.7% vs n = 5; 26.3%). The MDR pathogens identified were: *Methicillin-resistant Staphylococcus aureus* (n = 39; 52.7%) and *Pseudomonas aeruginosa* (n = 15; 20.3%), followed by *Acinetobacter baumannii* and *extended-spectrum β-lactamase producing Klebsiella pneumoniae*. Among sensitive microorganisms, *Pseudomonas aeruginosa* was the most frequently isolated bacteria (n = 7; 35%), followed by *methicillin-sensitive Staphylococcus aureus* (n = 4; 20%) and *Haemophilus influenzae* (n = 4; 20%). The number of risk factors was higher in patients with MDR pathogens (2.15 vs 1.47; p = 0.005). In-hospital mortality rate was higher in patients with MDR pathogens (27.1% vs 15.8%). The 30 and 90-day survival rate were higher in individuals with sensitive pathogens compared with MDR pathogens (84% and 79% vs 63% and 53%), respectively.
Conclusions: Pneumonia caused by multidrug-resistant (MDR) pathogens is associated to a greater number of risk factors, as well as a higher mortality. It seems urgent the development of local action protocols in these infections according to the patient profile, particularly of the risk factors and the ecology of each institution.

Key words: *Pneumonia. Multidrug-resistant pathogens.*

CO-049. 5 YEARS OF NON-TUBERCULOUS MYCOBACTERIA

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Introduction: Non-tuberculous mycobacteria (NTM) have been subject of increasing interest, with further sophisticated laboratory facilities for their identification and greater knowledge in regard to risk factors and clinical manifestations of the disease they cause. Lung disease caused by those microorganisms occurs more frequently in the presence of previous respiratory disease, especially with some degree of concomitant immunosuppression. Treatment should be individualized and its institution should be based on clinical, imaging and laboratory criteria.
Objectives: Characterization of patients with NMT isolation in the past 5 years at our hospital.
Methods: Retrospective cohort study, in which the medical record of patients who had at least one NTM isolation between 2011 and 2015 at our institution were analyzed. Assessed data: demographic characteristics of the patients, their medical history and medication, as well as diagnostic procedures and criteria for treatment. Statistical analysis was performed using SPSS Statistics® v.21.
Results: 68 patients had NTM isolation over the five years, equally distributed between both genders, with a mean age of 65 years. Almost half of the patients practiced agriculture. Concerning immunosuppression, 16% were regularly on immunosuppressive drugs, 15% were diabetic, 8 patients had some sort of active malignancy, 7 patients had chronic renal or hepatic failure, 4 patients were alcoholic and 3 patients had AIDS. As for pulmonary

disease, 43% of patients had bronchiectasis, 25% had COPD, 15% had some diffuse pulmonary disease (mainly silicosis), 13% had asthma, 4 patients had pulmonary tuberculosis history, 2 patients had lung cancer and 1 patient had emphysema secondary to alpha-1 antitrypsin deficiency. The most frequently isolated species were *M. avium* (38%), followed by *M. intracelullare* (34%) and *M. gordonae* (20%). Species of *M. lentiflavum*, *M. scrofulaceum* and *M. triplex* were also isolated. The involvement was mainly pulmonary, although one patient had mycobacterial isolation in skin biopsy and 2 patients with AIDS had disseminated disease caused by *M. avium*. In the thoracic CT scan, the most observed radiological pattern was bronquiectasic/nodular (54% of cases). A quarter of patients underwent treatment, especially those with infection by *M. avium*. None of the isolates of *M. gordonae* led to the institution of treatment.

Conclusions: The results confirm the importance of immunosuppression and pulmonary disease, in particular the existence of bronchiectasis, in the pathogenesis of NTM infection. Like it is described in literature, *Mycobacterium avium complex* species were the most commonly isolated, and *M. gordonae* isolation was not considered for treatment, because of its association with contamination of samples.

Key words: *Micobacteria. Non-tuberculous mycobacteria.*

CO-050. NON-TUBERCULOUS MYCOBACTERIA DISEASE. TEN YEARS EXPERIENCE

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Introduction: More than 150 species of non-tuberculous mycobacteria (NTM) have been described. They are ubiquitous in soil and water, and generally are opportunistic pathogens, so immunosuppression is the major risk factor for the disease produced by them. The estimated incidence of disease is 1.0 to 1.8 cases/100,000.

Methods: We retrospectively analysed the clinical records of patients diagnosed with NTM disease between January 2005 and December 2015 in the "Pulmonology Diagnostic Centre" (PDC) Almada-Seixal. The evaluation included the nationality/origin of patients, comorbidities, social characteristics, vaccination status with CGB, results of Mantoux test, location of infection, identified mycobacteria, diagnostic methods, treatment performed and its duration, associated toxicity and clinical evolution.

Results: 26 patients were included (65% men, mean age 55.9 years), mostly from Portugal (84%). The HIV infection and Chronic Obstructive Pulmonary Disease (COPD) were the most frequently encountered comorbidities (34.6% each). Alcoholism (19.2%) and illicit drugs consumption (11.5%) were the most prevalent risk factors. The vaccination status with CGB was unknown in 84.6% of patients, and 69.2% had no vaccine scar on clinical examination. The Mantoux test was performed on twelve patients, being positive in 7 of them. Infection by *M. avium* intracelullare was the most prevalent (53.8%), followed by *M. kansasii* infection (11.5%). Lung disease was present in 76.9%, and there were fibrocavitary disease in 19.2% of the total number. Disseminated infection was the second most frequent form of disease (20%). Consequently, the positive culture of products of pulmonary origin, including sputum and bronchial alveolar lavage (BAL) were those that provided more isolations (11 and 5 positives, respectively).

Conclusions: Two patients had a previous history of anti-mycobacterial therapy. Therapy was performed with combinations of 3 to 5 anti-mycobacterial drugs. The average duration of treatment for lung disease was 14.9 months (12 to 18). No documented fatal toxicity was registered. The treatment was completed in 73% of patients; 15% were under treatment; 8% died and 4% were transferred from the PDC.

Key words: *Non-tuberculous mycobacteria. Respiratory infection.*

CO-051. CORRELATION BETWEEN TUBERCULOSIS AND CANCER IN CENTRO DE DIAGNÓSTICO PNEUMOLÓGICO DA VENDA NOVA (CDPVN). EXPERIENCE OF THE LAST 10 YEARS

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Introduction: Pulmonary tuberculosis and lung cancer association is well known, particularly in countries with high incidence of tuberculosis (TB). Risk factors identified for this association are: male gender, age over 60 years, smoking habits pattern (smoker or ex-smoker), race (Caucasian and Asian) and morbidities associated such as chronic obstructive pulmonary disease (COPD) and diabetes mellitus (DM). TB has been linked to a increased risk of extrapulmonary tumors particularly hematologic. Prevalence of this association varies in different studies between 1 to 30%, which is explained by the different countries incidence and studies samples bias (comorbidities, associated treatments, etc.). The chronic inflammation conditioned by the infection is identified as one of the mechanism promoting carcinogenesis. Dysfunction of the immune system of oncology patients conditioned by pathology and pharmacotherapy use associated with follow-up of these patients contributes to increase the diagnosis of TB.

Objectives: Characterize and assess the prevalence of patients with simultaneous diagnosis of TB and cancer (pulmonary or extrapulmonary) in the past 10 years (2005-2014) in CDPVN.

Methods: Retrospective study through consulting Surveillance System CDPVN Tuberculosis (2005-2014). Patients selected were registered as having TB and cancer diagnosis. Statistical analysis data was performed with IBM SPSS Statistics Version 23Ò.

Results: From 1,652 patients, 44 had simultaneous diagnosis of TB and cancer (2.7%) with male predominance (59.1%) and average age 56.4 years. Smokers were 63.6%, ex-smokers 15.9% and non-smokers 20.5%. The presentation of TB had the following distribution: lung 61.4%, extra-thoracic adenopathy 11.4%, pleural 9.1%, genito-urinary 6.8%, latent infection 6.8%, other places 4.5%. Microscopy was positive in 27.3%, negative in 36.4% and undetermined in 36.4%. Culture was positive in 54.5%, negative 9.1% and undetermined in 36.4%. Radiologically: 45.5% had not cavitated lesion, 15.9% cavitated lesion and 36.4% without changes. Co-infection with HIV was 15.9%. Most frequent location of tumors were: haematological (lymphoma and leukemia) 22.8%, colon 13.7%, breast 13.6%, lung 9.1%, bladder 9.1%, other 31.7%. TB diagnosis and cancer was simultaneously (< 3 months interval) in 43.1%, preceded the tumor in 11.4% and occurred after neoplasia in 45.5%. All patients with lung cancer (n = 4) had pulmonary TB, with equal gender distribution. Half were active smokers and other ex-smokers (with smoking pack-year > 40). Histologically: 2 had squamous cell carcinoma diagnosed simultaneously with TB; 1 adenocarcinoma (TB diagnosis 1 year before) and the last one had no histological register.

Conclusions: Correlation between TB and cancer varies in different studies. This study demonstrated a low prevalence 2.7%. Risk factors identified for the correlation were: male gender, being active smoker, lung presentation of TB, positive culture and presence of radiological changes. Neoplasia type most associated with TB was hematological. There was a high prevalence of simultaneously TB and cancer diagnosis and TB after cancer diagnosis, fact possibly justified by the immunocompromised state and increased medical care of oncologic patients.

Key words: *Tuberculosis. Cancer. Mycobacterium tuberculosis. Carcinogenesis.*

CO-052. BIOLOGICAL THERAPY – "TUBERCULOSIS ALWAYS WILL BE A PROBLEM"

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Introduction: Chronic immunosuppression is a risk factor for tuberculosis (TB). The relative risk (RR) of developing tuberculosis is 1.6-25.2 higher in patients on anti-TNF therapy when compared to patients on conventional immunosuppressive therapy.
Objectives: This study aims to identify cases of progression from latent TB to active disease in patients undergoing biological therapy.
Methods: A descriptive study was conducted based on the content analysis of medical records concerning the period between January 2006 and December 2015. The sample included users with proposal for biological therapy, who had completed treatment for latent tuberculosis in Pulmonologic Diagnostic Center (PDC) of Almada.
Results: We identified 122 users with positive criteria for latent tuberculosis with proposal for biological therapy. 58.9% were from Rheumatology medical appointment, 26.2% from Dermatology and 13.1% from Gastroenterology. In none of the users, latent infection progressed to active disease. Of the reported cases, 3.27% have changed anti-tuberculosis therapy without suspension due to hepatotoxicity and skin toxicity.
Conclusions: This study documented non-progression of infection to active disease in all patients. All patients with immune-mediated inflammatory diseases, which are candidates for biological therapy should be screened for latent tuberculosis prior to initiating treatment.

Key words: *Tuberculosis. Latent tuberculosis. Biological therapy. Immune-mediated inflammatory diseases. Anti-TNF therapy.*

CO-053. CHARACTERIZATION OF THE GROUP OF PATIENTS ADMITTED WITH TUBERCULOSIS IN LOURES HOSPITAL

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Introduction: Tuberculosis (TB) is a multisystemic infectious disease and is still one of the leading causes of morbidity and mortality worldwide. It is a prevalent disease in Portugal, with as estimated incidence of 20.0/100,000 inhabitants, according to 2014 data from the Portuguese institute of national health (DGS).
Objectives: Characterization of the group of patients admitted with TB in the Infectiology Department of Hospital Beatriz Ângelo over a period of 40 months. Compare the results with DGS data released in the report "HIV Infection, AIDS and Tuberculosis in numbers".
Methods: Retrospective study including patients admitted in our hospital with the diagnosis of TB between January 2013 and April 2016. Clinical records were reviewed and epidemiological and clinical factors, as well as data regarding diagnosis and treatment were statistically analysed.
Results: A total of 89 cases were analysed. The majority of cases (47.1%) were within the 35-45 years-old age group, with the mean age being 43.4 (SD 17.3) years old. Males were more commonly affected (69.7%). 30.3% presented with Body Mass Index under 18.5 kg/m^2. We verified that 39.3% of patients were not of Portuguese origin. 6.7% of patients couldn't read or write, only 21.3% completed mandatory education and 31.4% were unemployed. Among the most frequently found comorbidities were smoking (40.4%), alcoholism (28.0%), human immunodeficiency virus (HIV) infection (25.8%) and diabetes mellitus (DM) (11.2%). Most patients presented with cough (70.7%), fever (58.4%) and weight loss (57.3%). Diagnosis was confirmed in 75.2% of cases, with a mean delay time of 83 (SD 113) days after onset of symptoms and 7 (s.d. 13) days after admission date. The majority of cases were classified as pulmonary TB (62.9%), 11.2% had only extra-pulmonary TB and 25.8% had both pulmonary and extra-pulmonary TB. Resistances were tested in 71.9% of cases and found in 43.8% of these. Resistances to pirazinamida and streptomycin were the most commonly identified, in 23.4% and 18.8% of patients, respectively. We had 1 case of multidrug resistant and another case of extensively drug resistant TB. Mortality rate during admission was 6.7% (n = 6), 2 of them being the cases of multidrug and extensive multidrug resistant TB.
Conclusions: We obtained a higher percentage of non-Portuguese born patients compared to DGS data, 39.3 vs 15.9%. We cannot totally rule out that this isn't just due to this being a more immigrant-populated area. The following comorbidities turned out to be more common in our population: alcoholism, 28.0% vs 11.0%, HIV infection, 25.8% vs 13.3% and DM, 11.2% vs 6.8%. Such differences might be attributable to the fact that these were patients with admission criteria. Antibiotic resistance was documented as following: the most prevalent was resistance to pirazinamide, found in 23.4% of our cases and not present in the DGS data, and the second most common was resistance to streptomycin, found in 18.8% of cases in our group of patients compared to 13.4% of cases from the referred data. This divergence supports the necessity of obtaining susceptibility tests whenever possible.

Key words: *Tuberculosis. Retrospective study. Comorbidities. Resistances.*

CO-054. VIDEO-ASSISTED THORACOSCOPIC LOBECTOMY: 100 PATIENTS

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Video-assisted thoracoscopic surgery (VATS) is accepted nowadays as the gold-standard surgical approach for the treatment of many lung diseases, such as lung cancer. In Portugal, the implementation of this technique has been done slowly and gradually, resulting that anatomic lung resections, such as VATS lobectomies, have been only initiated recently and there are still only few surgical centers with differentiation on this area. The evolution of the technique, along with the acquired surgical experience, allowed VATS, particularly VATS performed using only one small incision (Uniportal VATS), to be the preferred approach of our surgical center when performing lobectomies, providing all the advantages of this technique, such as less pain, less hospitalization time and less post-operative morbidity. The purpose of this study was to present the surgical outcomes of the first one hundred patients in which anatomic pulmonary resections were performed by VATS. From December 2013 through July 2016, one hundred and seven patients underwent uniportal VATS anatomic lung resections. The patients' demographics, lung functional capacity, surgical indication, approach and type of surgery, as well as morbidity and mortality were analyzed. It was also studied the learning curve of this approach, comparing the group of the first fifty patients (group A) versus the group of the second fifty patients (group B) that underwent VATS lobectomy. Surgery was performed in 64 male and

43 female with a mean age of 61 years (range, 19-79 years), with 54% of the patients being smokers. Lung cancer was the leading surgical indication (n = 95). One hundred and seven surgeries were begun by VATS, being completed by uniportal VATS 91 surgeries, by two-port VATS 9 surgeries, and by thoracotomy 7 surgeries – conversion (6.5%) performed due to bleeding and/or technical impediment. All kinds of anatomic lung resection were performed, such as lobectomies, bilobectomies and anatomic segmentectomies. The mean surgical time was 135 minutes (160 min in group A; 100 min in group B; $p < 0.001$) and mean intra operative drainage was 172 cc (210 cc in group A; 121 cc in group B; $p < 0.001$). Conversion rate was 9.1% in group A and 3.8% in group B. Median hospitalization time was 5 days (minimum hospitalization time was 2 days). There was no operative or 30-days mortality and the main complication was persistent air leakage in 12 patients in group A and 5 patients in group B. Uniportal video-assisted thoracoscopic surgery has become the number one choice by many surgical centers for anatomic lung resections, such as lobectomies. Particularly in lung cancer, this approach has all the advantages of a minimal invasive surgery, without compromising the safety and efficiency of oncologic treatment. This technique is considered by the authors as the election approach in thoracic surgery, whereby it must be considered in the referencing of this patients.

Key words: *Video-Assisted Thoracoscopic Surgery. VATS. Uniportal VATS.*

CO-055. PNEUMONECTOMY IN LUNG CANCER: ANALYSIS OF 10 YEARS OF EXPERIENCE

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Introduction: Pneumonectomy, the surgical removal of a lung, may be inevitable due to the central location of the primary tumor. In recent years we have seen a decrease in the percentage of pneumonectomies made comparatively with more conservative resections.
Objectives: Our purpose was to assess the progression free survival (PFS), overall survival (OS), type of chemotherapy (CT), characteristics of the tumors and patients in which a pneumonectomy were performed.
Methods: Retrospective study of 59 patients undergoing pneumonectomy for lung cancer at Hospital Pulido Valente between 1 January 2004 and 31 December 2013.
Results: During this period, 517 lung resections were performed due to lung cancer, being the percentage of pneumonectomies of 11.44% (59). The median age was 58 years (38-77). 80% of the patients were male. 84.7% smokers or ex-smokers. The histological types were adenocarcinoma (ADC) 45.8% (27), squamous cell carcinoma (SCC), 42.4% (25), sarcomatoid carcinoma (CS) 6.8% (4) and neuroendocrine tumors (NETs) 5.1% (3). According to the preoperative stage 3 patients (5.1%) were in stage IA, 12 (20.3%) IB, 9 (15.3%) IIA, 11 (18.6%) IIB, 20 (33.9%) IIIA and 4 (6.8%) in stage IIIB. 24 patients (40.7%) received neoadjuvant chemotherapy with platinum-doublet. A partial response was achieved in 54.2% of the cases. The best response was obtained at stage IIIA (69%), followed by IIB (23.1%) and IIIB (15.4%). 41 patients (69.5%) received adjuvant chemotherapy with platinum-doublet and 13 (23%) adjuvant radiotherapy (RT). The overall postoperative mortality at 30 days was 8.5% (5). The most frequent causes of death were due to decompensated heart failure and hemorrhagic shock. Recurrence of the systemic disease ocurred in 26 (44%) patients, there were no local recurrences. The most common sites of metastasis were the contralateral lung (46%) and the brain (27%). 26 patients (44.1%) are alive with a median time after the surgery of 83 months. The median OS of the 33 (55.9%) deceased was 30 months. The patients with ADC had a mean PFS of 51.7 months (95%CI, 32.7 to 70.7 months) and a mean OS of 61.2 months (95%CI, 45.9 to 76.4 months); whereas the patients with SCC had a mean PFS of 92.5 months (95%CI, 69.5 to 115.6 months) and a mean OS of 94 months (95%CI 72-116 months).
Conclusions: This results indicates that pneumonectomy is a surgical technique with an acceptable mortality in the context of the oncologic disease. The high survival probably relates to the rigorous selection of the patients.

Key words: *Pneumonectomy. Lung cancer. Surgery.*

CO-056. EARLY RECURRENCE IN COMPLETE RESECTED NON SMALL CELL LUNG CANCER PATIENTS

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Introduction: Surgery remains the primary treatment option with curative expectation, in the treatment of early stage lung cancer. However, even in early stages, the neoplastic disease invariably relapses in a significant number of patients, sometimes even early. The determinants of this behaviour are still partially undetermined, given the multiplicity of the characteristics of tumors and patients.
Objectives: Identification and characterization of patients with lung cancer undergoing surgery with curative intent. Evaluation of demographic, radiological and pathological characteristics, as well as determination of its relationship with recurrence and clinical outcome.
Methods: Retrospective analysis of all patients that underwent surgery with curative intent for lung cancer treatment, from 2008 to 2014, followed in C. H. S. João. Clinical, demographic, radiological, surgical and pathological (histological subtype, differentiation, microscopic histological pattern, vascular and lymphatic permeation, pleural involvement, surgical margin, pathological TNM classification) data was collected and analysed. It was recorded the occurrence of relapse and its location. SPSS was used for statistical analysis, with $p < 0.05$ was considered statistically significant.
Results: Included 191 patients with a mean age of 64.1 (± 9.3) years, and 73.3% (n = 140) were male. Most reported smoking habits (44.7% smokers, 31.8% ex-smokers). Performance status evaluated by Zubrod scale of 0-1 (97.8%). On imaging, patients had peripheral nodules in 69.6%, peripheral mass in 16.8%, central mass in 2.1% and broncho-lobar in 11.5%. In the surgical approach, it was performed lobectomy in 87.4%, atypical resection in 5.8%, pneumonectomy in 4.7% and segmentectomy in 2.1%. Adenocarcinoma was the most common histological type (71.7%), followed by squamous cell carcinoma (16.2%). Regarding differentiation, 14.9% had well-differentiated cancer, 49.1% moderately differentiated and 36% poorly differentiated. With respect to microscopic pattern, it was found tubular pattern in 61.8%, lepidic in 36.6%, solid in 35.1%, papillary in 31.4%, micropapillary 10.5% and mucinous in 15.2%. It was registered permeation in 60.2% (venous in 50.8%), pleural invasion in 45.5%, positive surgical margins (R1) in 5.2%. Regarding TNM classification: 26.7% at T1a and 13.1% at T1b; 68.1% at N0 and N1 at 16.8%; only 1 patient with M1. In 39.3% occurred recurrence of cancer (24.1% local and 15.2% at distance), and in 30.4% the recurrence was early (≤ 2 years). In this series, the median survival of patients has not been reached; 69.1% of patients are still alive after a maximum of 101 months of follow-up. We found that the presence of pleural invasion ($p = 0.046$), venous permeation ($p = 0.01$), R1 ($p = 0.006$) and TNM ($p < 0.001$) were significantly associated with early

relapse. Among the patients who relapsed, median survival was significantly better in cases of local recurrence (56 vs 30 months, p = 0.007).
Conclusions: In this case series of patients with lung cancer undergoing surgery, besides the TNM classification and surgical resection, certain pathological characteristics such as the presence of pleural invasion and venous permeation have shown to be associated with early recurrence. Thus, these features should be taken into account in the prognostic evaluation of these patients, and may justify a more aggressive therapeutic approach after surgery.

Key words: *Lung cancer. Surgery. Recurrence.*

CO-057. PULMONARY ASPERGILLOMA: WHEN SURGERY IS THE BEST OPTION

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Introduction: Some fungal *Aspergillus spp* species can cause lung disease. Pulmonary aspergilloma and chronic pulmonary aspergillosis are frequently caused by the colonization of lung cavities, related to tuberculosis sequelae, bronchiectasis or emphysema. Other related pathologies are chronic necrotizing pulmonary aspergillosis, invasive pulmonary aspergillosis and allergic bronchopulmonary aspergillosis. Therapeutic options include lung resection surgery that, although considered the only long-term effective option, has limited indications due to its post-operatory morbidity and mortality.
Objectives: The aim of this study was to analyse the characteristic of patients submitted to aspergilloma resection surgery in our center for a period of 26 years (1990-2016).
Results: Surgery was performed in 88 patients, mostly male (n = 64, 73%), aged 47 ± 12 years-old, almost half of them smokers/former smokers (n = 41, 47%) of 43 ± 23 pack-year. Most frequent pulmonary pathologies included tuberculosis (n = 64, 73%), bronchiectasis (n = 16, 19%) and emphysematous bullae (n = 5, 6%). Immunosuppression was present in 11 patients (13%). As main symptom, most patients presented haemoptysis (n = 74, 84%) and chronic cough (n = 58, 68%). Aspergillomas were classified as simple (n = 36, 41%) and complex (n = 52, 59%), according to Belcher et al e Daly et al. Lesions were located mainly in upper lobes (78%) and most frequently in the right lung (51%). The most frequent surgical procedure was lobectomy (n = 66, 75%), followed by pneumectomy (n = 10), wedge resection/segmentectomy (n = 9) and bilobectomy (n = 3). Post-surgical complications occurred in 37 patients (42%): air leak for more than 10 days (n = 21); empyema (n = 9); nosocomial pneumonia (n = 7). Surgical mortality rate (30 days) was 5% (n = 4) and 9 patients (10%) were re-operated. Patents were submitted to thoracic drainage for a median of 5 days and median hospitalization duration was 11 days. Patients were followed in consult for a mean of 9 months (global mortality 6/88 patients – 7%). There was contralateral disease recurrence in 2 patients.
Conclusions: As previously described, this case series presents a predominance of male middle-aged patients, with complex aspergillomas in pre-existing cavities, mainly due to tuberculosis sequelae. The principal surgical indication was the presence of haemoptysis. Post-surgical morbidity is significant and related to the presence of complex aspergillomas and comorbidities; this way, surgery, a long-term effective treatment option, should be timely considered in asymptomatic patients with no comorbidities.

Key words: *Aspergilloma. Treatment. Surgery. Morbidity. Mortality.*

CO-058. LUNG TRANSPLANT FOR SILICOSIS – THE PORTUGUESE EXPERIENCE

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Lung transplant is indicated for patients with terminal chronic pulmonary disease, including many different pathologies such as diffuse parenchymal disease, with maximized medical therapy, without contraindications for the procedure. Lung transplant surgery is known to be a complex surgery with many demanding technical steps. With this study we intend to approach particularly the patients that underwent lung transplant for Silicosis. Even though it is a rare indication it presents massive challenges to the transplant team whether it is because of the difficulties doing the pneumonectomy due to the tremendous calcification of the hilar structures, or the possible intra-operatory complications and their solution, muscular lesions to the surgeons, among others. We also describe the operating, times, length of stay and long-term results. Among the lung transplants performed to date, in Portugal, 48% were because of interstitial disease, and only 7 were due to silicosis. All the patients were male, with an average of 48 ± 9 years of age, [38-61]. They all underwent unilateral lung transplants (5 left sided and 2 right sided). One of the patients required support with ECMO VA, because of severe pulmonary hypertension and acidosis and one other required emergency extracorporeal circulation because of a vascular iatrogenic lesion. The average ischemia time was 415 ± 130 minutes and there was no intra-operative mortality. Two of the patients had primary graft dysfunction. The mean length of stay was 51 ± 31 days [18-109], and all the patients were discharged clinically well. Five of the patients (71%) are alive and the longest living survivor has had his procedure over 7 years ago. Albeit all the presented difficulties, the high surgical demand, and the many typical co-morbidities of these patients, our series shows good results, not inferior to the patients transplanted for other pathologies. Therefore lung transplant should be offered as the therapeutic option for these patients.

Key words: *Lung transplant. Silicosis.*

CO-059. ROBOTIC LUNG SURGERY. THE INITIAL EXPERIENCE

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Minimally invasive thoracic surgery has been progressively growing in Portugal. In the beginning, in 1992, it was only used for simple procedures. In 2008 the first VATS lobectomy was performed. Currently there are many centers routinely using this approach. Recently the technological development allowed the development of minimally invasive surgery with the beginning of robotic thoracic surgery (RATS). This uses a 3D vision and reproduces in the instruments the movements of the human hand. Consequently the precision and safety of minimally invasive surgery has increased. With RATS we can, therefore, undergo more difficult procedures such as segmentectomies and bronchoplastic resections, besides improving the quality of the lymph node dissection. The first robotic lung surgery in Portugal was performed on the 2nd of june 2016, at Hospital da Luz, and we present in this work the first 6 cases that have been done up to this date. The surgeries consisted in one right lower lobectomy (RLL), one middle lobectomy, one apical segmentectomy of the left lower lobe (LLL), one apico-posterior segmentectomy "en bloc" with wedge of the LLL, and a wedge of the RLL. Five of these cases were done for neoplastic pathology and in one other the frozen section confirmed to be a benign lesion. In all the cases of lung cancer the systematic lymph

node dissection was performed with at least 5 groups removed. There were no peri-operatory complications. We are still at an early stage to evaluate the surgical time and length of stay but for now it is at least equivalent to VATS procedures. RATS seems to allow a shorter learning curve when compared to VATS, especially when VATS skills were previously acquired. This innovation in thoracic surgery will allow a more effective surgical treatment, with less pain and recovery time, shortening the length of stay. Whenever possible and indicated, the anatomic segmentectomy can be performed by RATS, allowing lung sparing procedures in the patients with early lung cancer.

Key words: *Robotic surgery. Lung cancer. Minimally invasive surgery.*

CO-060. REOPERATION BY THORACOSCOPY AFTER THORACOTOMY: SAFE AND EFFICIENT APPROACH?

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Introduction: Thoracic surgery by thoracotomy frequently induces creation of extensive pleural adhesions, making the reoperation a more complex procedure that can became a laborious surgery with increased aggressiveness for the patient. Minimally invasive surgery is usually associated with less pleural damage and consequently less adhesions. Thereby, reoperations after thoracoscopy are used with more frequency and less difficulty. However, reoperation by thoracoscopy after previous thoracotomy are not a usual procedure.
Objectives: We pretend to evaluate the practibility of reoperation by thoracoscopy after previous thoracotomy.
Results: We present the results and video of 3 patients, previously submitted to thoracotomy and who were reoperated after 5 and 9 years, for malignant disease recurrence. The preferred approach was thoracoscopy, and all surgeries underwent without complications or need for conversion. Wedge resection for lung metastasis was performed in two cases, and patients were released on the third postoperative day. The other patient had wedge resection in the past and underwent completion left upper lobectomy, being released ten days after surgery because of prolonged air leak.
Conclusions: With these cases we pretend to show that reoperation by thoracoscopy not only is safe and practible, but in many cases may be the best approach. Allows for better visualization and surgical approach of existing pleural adhesions. However, it should be performed in centers with experience in minimally invasive surgery.

Key words: *Surgery. Reoperation. Surgical risk.*

CO-061. JOLLY VS PIGTAIL CHEST-TUBE: ARE THEY SIMILAR FOR TREATMENT OF MALIGNANT PLEURAL EFFUSIONS?

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Introduction: Chest-tube drainage with Jolly or Pigtail followed by chemical pleurodesis is an available option for treatment of malignant pleural effusions, but the optimal chest-tube type and size for pleurodesis remains controversial.
Objectives: To compare the efficacy of Jolly vs Pigtail chest-tube in the drainage and pleurodesis of malignant pleural effusions.
Methods: Retrospective study of patients submitted to chest-tube drainage and slurry talc pleurodesis due to malignant pleural effusion in our Pulmonology ward from 01/2012 to 05/2016. According to the type of chest-tube, patients were divided in two groups: group I – Jolly chest-tube and group II – Pigtail chest-tube. Mortality, recurrence of malignant pleural effusion and timelines associated with the procedures were reviewed. The Mann-Whitney and the χ^2/Fisher tests were used to compare both groups.
Results: Of 80 patients with malignant pleural effusion submitted to chest-tube drainage, 25 were excluded (18 did not undergo pleurodesis and 7 underwent pleurodesis through medical thoracoscopy). Out of the 55 included patients (31 men, median age 72 years-old, 33 lung cancer), 42 (76.4%) matched group I (18-22 French chest-tubes) and 13 (23.6%) group II (8-10 French chest-tubes). Only 1 patient had Pigtail chest-tube obstruction, with posterior insertion of Jolly chest-tube. Death during hospital stay (group I vs group II: 14.3% vs 7.7%; p 1.000) and up to 3 months (group I vs group II: 42.9% vs 53.8%; p 0.487), recurrence at 4 weeks (group I vs group II: 15.2% vs 25.0%; p 0.661), total length of stay (median group I vs group II: 12 vs 15 days; p 0.641), time from chest-tube insertion to pleurodesis (median group I vs group II: 6 vs 8 days; p 0.170) and time from chest-tube insertion to withdrawal (median group I vs group II: 8.5 vs 10 days; p 0.514) were not significantly different between the two groups.
Conclusions: In our cohort, the efficacy of Jolly and Pigtail chest-tube was similar. This suggests that Pigtail could be an alternative of palliation, on a case by case basis with no compromise in pleurodesis performance.

Key words: *Malignant pleural effusion. Chest-tubes. Pleurodesis.*