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CO 001. EXACERBATIONS ON PATIENTS WITH PULMONARY HYPERINSUFLATION: DESCRIPTIVE STUDY

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Objective: The primary end-point of this study was to establish the number of exacerbations of patients with pulmonary hyperinsufflation and chronic respiratory failure due to pulmonary obstructive pulmonary disease (COPD), over the course of a one year follow-up period. The secondary end-points were to characterize severe exacerbations and symptoms.

Methods: We conducted a descriptive, observational and retrospective study. The target population was composed of patients admitted to chronic respiratory failure hospital appointments. We reviewed all processes, and used SPSS®, version 21 to collect and analyse data. We applied the qui-square test, with $p > 0.05$ taken as statistically significant, to study the association between variables. **Results:** 37 patients were included in the study, out of the total number of enrolled patients ($n = 96$). The average age was 68.81 years old ($\sigma = 10.91$), and the majority of patients were male (78.4%). The average FEV₁ value was 40.81% ($\sigma = 15.99$) and 73% had FEV₁ < 50%. The average of severe exacerbations was 0.76 ($\sigma = 1.23$) and 21.6% had at least two severe exacerbations. Of patients with RV $\geq 150\%$ ($n = 27$), 62.9% had at least one exacerbation ($p > 0.05$) and 37.0% had at least one severe exacerbation with hospital admission ($p > 0.05$). Seventy-seven point eight had FEV₁ under 50% ($p > 0.05$) and 51.9% had CAT score ≥ 20 ($p > 0.05$). Of patients with TLC $\geq 120\%$ ($n = 19$) 57,8% had at least one exacerbation ($p > 0,05$) and 36,8% had at least one severe exacerbation ($p > 0,05$). Among patients with severe exacerbations ($n = 13$), 53.8% had RV $\geq 200\%$ ($p > 0.05$); 92.3% had FEV₁ < 50% ($p > 0.05$); 69.2% had CAT score ≥ 20 ($p > 0.05$) and 23.1% had BMI < 20 ($p > 0.05$).

Conclusions: There is a high prevalence of FEV₁ less than 50% among patients with COPD and Respiratory Failure (73%). Among the patients with pulmonary hyperinsufflation, we found a high prevalence of exacerbations (62.9%), although there is no statistical significance. There is no statistical significance between the patients with severe exacerbation and the following variables: high level of symptoms, low BMI, low FEV₁ or high RV. These results help

to support the concept of COPD heterogeneity and the difficulty in understanding risk factors which contribute to exacerbations.

Key words: Pulmonary hyperinsufflation. Exacerbation. COPD. Chronic respiratory failure.

CO 002. CHARACTERISTICS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE GOLD 3 AND 4 PATIENTS IN HOSPITAL BEATRIZ ÂNGELO

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Introduction: Chronic Obstructive Pulmonary Disease (COPD) has an estimated prevalence of 14,2% in the adult population above 40 years old, in Lisbon. In Portugal, there are only a few studies about COPD patient characteristics, especially in its later stages. Therefore, we sought to characterize COPD GOLD 3 and 4 patients followed as outpatients in the pulmonology department of Hospital Beatriz Ângelo.

Methods: Of the pulmonary function tests (PFT) performed in 2014 a tour hospital, we selected all patients with a severe or very severe airflow limitation. Their clinical data was reviewed in order to identify those with COPD. These were characterized with regard to demographics, smoking history, symptoms, functional evaluation, comorbidities and treatment. We also established the correlation between demographics, degree of dyspnea and functional assessment.

Results: Of the 71 PFT identified, 10 patients were excluded because they had another obstructive lung disease and 3 because their functional evaluation was performed during an exacerbation. Thus, 58 patients were retrospectively analyzed: 83% were male, the mean age was $65,1 \pm 9,2$ years and the mean body mass index was $26,6 \pm 5,8$ kg/m². Tobacco smoke was the risk factor in all patients and 33% were still smoking. We found a statistically significant difference (p value 0,01) between the degree of tobacco exposure in men and women (mean of 64 and 38,8 pack-years, respectively). However, there was no relationship between the degree of tobacco exposure and airflow limitation or a statistically significant difference between the airflow limitation in men and women (p value 0,92). Concerning the relationship between the degree of dyspnea, assessed by the modified Medical Research

Council (mMRC) scale, and other data, we found a weak negative linear relationship with the forced expiratory volume in the first second (FEV₁) ($r = -0,22$) and the carbon monoxide diffusing capacity adjusted to the alveolar volume ($r = -0,35$). No relationship was found between the degree of dyspnea and other variables such as age, level of tobacco exposure and residual volume. 67% performed the 6 minute walk test and the average walked distance was $338,6 \pm 116,8$ meters. No relationship was found between the walked distance, FEV₁ and degree of dyspnea. Lung cancer had a prevalence of 3% and obstructive sleep apnea of 10%. 76% of patients were medicated with triple therapy (long-acting anticholinergic bronchodilator, long-acting beta-agonist bronchodilator and inhaled corticosteroid). The pneumococcal vaccination had been given to 60% of patients. 60% were referred to Pulmonary Rehabilitation consultation.

Conclusions: Tobacco smoke is the main risk factor and despite women having a lighter exposure, they had a degree of airflow limitation similar to men. Although weak, there is a relationship between symptoms and functional evaluation. The scant economic resources of the population studied may justify the limited number of patients vaccinated and referred for pulmonary rehabilitation.

Key words: *Chronic obstructive pulmonary disease. Tobacco exposure. Symptoms. Functional evaluation.*

CO 003. PULMONARY EVALUATION AS DECISION FACTOR IN HYPERBARIC OXYGEN THERAPY

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Introduction: Hyperbaric Oxygen Therapy (HBOT) is a treatment that consists in administration of 100% oxygen, in a pressurized environment - 2-3 atmospheres (ATA) - by nasal mask, cephalic tent or endotracheal intubation. During treatment sessions patients are inside a therapeutic pressurized vessel, designated Hyperbaric Chamber. Patients clinical evaluation, must be multidisciplinary, due to the diversity of diseases treated as well as to different type of contraindications. Pressure changes during HBOT session, determine changes in ventilatory mechanics and physiological adaptations of patients, so any pulmonary contraindications should be identified in the initial assessment. To quantify the importance of Respiratory Medicine, in this clinical context, authors analyzed the profile of patients referred to the Centre, particularly epidemiological data, cause and place of referral, respiratory pathology background, regular therapy and causes of exclusion from treatment.

Methods: A performed retrospective analysis of medical records of 633 patients consulted in the Underwater Hyperbaric Medicine Center between January 2014 and July 2015, to perform elective treatment. Statistical analysis of the data was performed using the mean and standard deviation.

Results: Most patients were male (60.2%). The mean age was 55.87 ± 15.81 years - 19 were pediatric patients (≤ 18 years). 511 patients (80.7%) were referenced from hospital services (18.9%) and 120 by the attending physician. Among pathologies referenced the most frequent sudden deafness (335), Radic cystitis (83), chronic ulcers (35) and osteoradionecrosis (33). 101 patients (15.9%) had history of smoking, 53 (8.3%) maintaining regular active consumption. 133 patients (21%) had a history of respiratory disease, especially Asthma (29), pulmonary tuberculosis (19) and COPD (15). 19 patients performed regular treatment for their respiratory disease. Two patients reported a history of spontaneous pneumothorax. In addition to the protocol tests it was necessary to make Functional Respiratory Study in 48 cases and 24 CT chest for clinical decision support. 98 patients (15.5%) did not have conditions to be

submitted to HBOT - 44 for lack of indication and 54 because of contraindications. 26 had pulmonary contraindications (48.1% of contraindications). 36 made inhaled or oral therapy "again" during the period of HBOT, for optimization of tolerance to treatment.

Conclusions: Hyperbaric Oxygen Therapy (HBOT) is an important therapeutic tool in treatment of several diseases. Any respiratory contraindications should be screened early, as they represent an important cause of exclusion of patients referred for treatment. Respiratory function tests and imaging evaluation are appropriate support instruments in clinical decision. Pulmonary evaluation should be seen as an important decision factor in prescribing this type of treatment.

Key words: *Hyperbaric oxygen therapy. Hyperbaric chamber. Contraindications. Pulmonary evaluation.*

CO 004. IDENTIFICATION AND CHARACTERIZATION OF ACOS PATIENTS IN A HOSPITAL PULMONARY OUTPATIENT CONSULTATION - APPLYING THE QUESTIONNAIRE PROPOSED BY GINA/GOLD CONSENSUS

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Introduction: Asthma-COPD Overlap Syndrome (ACOS) is currently recognized as a distinct clinical entity. It is characterized by chronic airflow limitation with various features associated with asthma and COPD. The consensus document resulting from a joint project of GINA and GOLD, published in 2014, proposes the application of a questionnaire in order to facilitate the identification of ACOS patients in clinical practice.

Objective: Identification and characterization of a group of patients with ACOS followed in a Hospital Pulmonary outpatient consultation.

Methods: A sample of 462 patients with asthma/COPD history followed in a Hospital Pulmonary outpatient consultation at Hospital Pedro Hispano in 2014 was analyzed. Patients with ages ≥ 35 years and functional assessment were included. The questionnaire based in a syndromic approach and published in 2014 by the GINA/GOLD consensus was applied to all patients.

Results: COPD diagnosis was obtained in 238 (51,5%) patients, asthma in 190 (41,1%) and ACOS in 34 (7,4%). In the group with ACOS diagnosis the average age was 61 years (minimum: 35, maximum: 86); 19 patients (55,9%) were male. All patients had history of exposure to risk factors ($n = 34$): tobacco smoking ($n = 33$; 97,1%), occupational exposure/biomass fuel ($n = 7$; 20,6%). Fifteen patients (44,1%) had family history of asthma and/or other allergic diseases. All patients had persistent airflow limitation: 15 patients (44,1%) with severe obstructive ventilatory defect, 14 (41,2%) with moderate and 5 (14,7%) with mild obstructive defect. In nineteen patients (55,9%) it was not possible to obtain previous documentation of positivity in the bronchodilator test. The remaining 15 (44,1%) had at least one positive result, 5 of whom (33,3%) had a strongly positive test. Exacerbations in the last year were documented in 18 patients (52,9%): 10 (55,6%) had ≥ 2 exacerbations and 5 (27,8%) at least one hospitalization. Half of the patients with exacerbations ($n = 9$; 50,0%) had a severe obstructive ventilatory defect. Most patients ($n = 32$; 94,1%) were treated with inhaled corticosteroids and long-acting bronchodilators.

Conclusions: The prevalence of ACOS in the sample analyzed is lower than the reported in some studies. However, in published works, there has been a great variability in the definitions used. As it has been described, the majority of ACOS patients present a major functional impairment and are exacerbators.

Key words: *ACOS. COPD. Asthma. Questionnaire. Characterization.*

CO 005. FOLLOWDPOC: FOLLOW-UP CHARACTERIZATION OF THE CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS OF THE FAMILY HEALTHCARE UNIT NUNO GRANDE

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Introduction: Chronic obstructive pulmonary disease (COPD) is characterized by the decreased flow of the airways, often associated to progressive and disabling respiratory symptoms. According to data from the Local Health Plan of Health Centers Grouping (ACES) Douro I, COPD is associated with higher prevalence and standardized mortality rate compared to those seen on the Continent and in the Northern Region. The evaluation of symptoms in risk groups and the confirmation of the diagnosis by spirometry are essential as well as periodically evaluation of the severity degree (based on spirometry, symptoms and exacerbations) and monitoring of inhalation technique compliance. Adequate follow-up of patients contributes to the quality of life improvement, prevention of exacerbations and health care costs reduction.

Objective: This study aims to characterize patients with COPD of USF Nuno Grande and their follow-up particularly spirometry, inhalation technique and hospital referral and analyze the severity degree correlating it with previous aspects.

Methods: This is a cross-sectional, observational, descriptive and analytical study. Of the 185 patients of the USF diagnosed with COPD/chronic bronchitis a random sample of 53 patients was selected following sample size calculation considering the power of study of 90% and 95% confidence interval (Epi InfoTM7[®]). A personal interview was conducted and a questionnaire was applied in order to characterize the following variables: demographic data, risk factors, hospital follow-up, inhaler(s) used, knowledge about the use of the device and severity degree. The statistical analysis of data was realized using SPSS[®] version 22.

Results: The mean age of the sample was 60 years, most were females (52.8%), 24.5% smokers and 45.3% had a fireplace at home. Spirometry was performed at USF in the last three years in most of patients, and 30.2% of patients were followed in Pulmonology consultations. Included patients used on average 1.2 different inhalers, being dry powder multidose the most used type of device. Most participants stated that the inhalation technique was explained to them by the family doctor but not demonstrated and the majority of patients reported not carrying the device for consultations, so it appears that there is no technical monitoring. Concerning severity degree the most belonged to Category Class A (GOLD 2015).

Conclusions: There is a high number of patients in an advanced stage of disease, which might be related to late diagnosis or lack of adequate follow-up. Standardized and organized follow-up of patients with COPD in primary health care, similarly to what already happens with other chronic conditions, is essential. To improve the patients' prognosis and quality of life, reducing costs, this follow-up should include: prevention of risk factors, encouraging appropriate physical exercise, smoking cessation interventions, frequent review and correction of inhalation technique, recommended vaccination and assessing the severity degree performing the respective therapeutic setting.

Key words: COPD. Follow-up. Spirometry. Inhaler technique. Severity degree.

CO 006. CHARACTERIZATION OF THE RESPIRATORY FUNCTION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ASTHMA COMPARED TO OTHER AETIOLOGIES

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Introduction: Asthma-COPD Overlap Syndrome (ACOS) is characterized by persistent airflow limitation with most features associated with Asthma as well as Chronic Obstructive Pulmonary Disease (COPD). Objective assessment of ACOS with lung function tests, including post bronchodilator FEV₁, lung volumes and the diffusion capacity of carbon monoxide which are of crucial importance to the diagnosis. The aim of this study is to characterize and quantify respiratory function changes in patients with ACOS compared to other aetiologies of COPD.

Methods: This is a cross-sectional study with patients with COPD or Overlap Syndrome Asthma/COPD diagnosis whose first medical visit occurred between 2012 and 2014, in the pulmonology service of Centro Hospitalar São João. Participants were divided into three groups, Asthma/COPD, COPD and ACOS. The results of spirometry, body plethysmography and diffusion capacity of carbon monoxide (DLCO) were analysed and compared among the 3 groups and with COPD subgroups (smoking, occupational and indoor exposure). Predictive factors for ACOS, the severity criteria and the pharmacological therapeutic were also studied.

Results: One-hundred and seventeen patients were included. In the Asthma//COPD group was not verified a significant increase of post bronchodilator FEV₁ (p = 0.078). Likewise, this variable had a slight decrease among Asthma//COPD group and COPD subgroups. The TLC in the ACOS group was the higher mean to Asthma/COPD group (p = 0.011). The same significant difference was observed in RV (p = 0.048). All groups presented DLCO in mean decreased.

Conclusions: In this study, there were not any significant differences in FEV₁ variation after bronchodilation, neither on the DLCO test among all groups. The ACOS patients had hyperinflation whereas mostly individuals from Asthma/COPD group showed air-trapping. These results can possibly be explained by airway remodelling and unclear ACOS diagnosis.

Key words: Asthma. Chronic obstructive pulmonary disease. Overlap syndrome. Respiratory function tests. Airway inflammation. Airway obstruction. Airway hyperresponsiveness. Airway remodelling.

CO 007. BESTRESP: INHALER TECHNIQUE IMPROVEMENT IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS OF THE FAMILY HEALTHCARE UNIT NUNO GRANDE

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Introduction: Chronic Obstructive Pulmonary Disease (COPD) is a worldwide prevalent pathology. According to data from the Local Health Plan of Health Centers Grouping (ACES) Douro I, COPD is associated with higher prevalence and standardized mortality rate compared to those seen on the Continent and in the Northern Region. Inhaled therapy is the preferred route of administration of the drugs used in the treatment of COPD and the correct inhaler technique critical for their effectiveness, treatment of disease and symptom control. Several studies show that errors in inhaler technique are frequent and one of the causes of therapeutic failure.

Objective: Assess the patient's inhaler technique with its own inhaler; evaluate the influence of patient characteristics on the degree of technical enforcement; check that occurs improved technique with the intervention of revision and correction in the immediate and short-term (in the same day and after about a month, respectively) and to identify the most frequent errors with each type of inhaler.

Methods: This is an experimental study, pre and post intervention type, without a control group, with descriptive and analytical components. The intervention consisted of the review of the inhalation technique and correction of the possible errors. The study

included the registered users in the USF Nuno Grande under the codes Chronic obstructive pulmonary disease (R95) and/or Chronic bronchitis (R79) registered in the SCLínico® problem list, being made an in-person interview in which the researchers filled out the prepared questionnaire alongside with the electronic health record consultation. The variables studied were: demographic data, years of disease progression, hospital follow-up, number of exacerbations, number and type of inhalers, knowledge about the use of the device(s) and evaluation of pre- and post-intervention inhalation technique. Statistical analysis was done using the SPSS® v.22 and Excel®.

Results: The data from 30 users were analysed, with mean age of 70 years, 52% female, using on average 1.24 different inhalers and 31% followed in Pulmonology consultations. The errors in inhaler technique were frequent (pre-intervention average of 2.4 errors/participant), being the most frequently observed lack of previous deep expiration (65%) and the absence of apnea (54%). There were other errors that make the administration of the drug nonexistent/decreased: not removing the device cover (8%), not placing the capsule or not triggering the dose releasing mechanism (27%). In 13.8% of cases there were no available doses in the inhaler. Only 16% performed the technique correctly and in other the intervention was associated with the technique improvement in the immediate in 97% of cases (post-intervention average of 0.1 errors/participant), with the study underway to check whether the improvement in the short-term holds.

Conclusions: The errors of the inhaler technique are frequent in patients with COPD, and the education and periodic re-evaluation of the technique is key to improving the follow-up of the patient and disease severity. The family doctor should periodically review the inhaler technique, correcting the possible existing errors and thus contribute to better patient monitoring.

Key words: COPD. Inhaler technique improvement. Education. Quality improvement.

CO 008. RISK FACTORS AND MORTALITY IN ADMISSION FOR ACUTE EXACERBATION OF COPD

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Introduction: Chronic obstructive pulmonary disease (COPD) will be in 2020 the 3rd most common cause of death worldwide. Comorbidities increase mortality. For these reason several studies are trying to identify which one are the most implicated in this mortality.

Objective: Describe the population with the diagnosis of COPD that was hospitalized in the Pulmonology Service of Hospital Geral do Centro Hospitalar e Universitário de Coimbra from 2010 to 2014 and identify risk factors associated whit mortality.

Methods: This is a retrospective and descriptive study. And the sample collected through the computer program SAM® and treated statically in Excel®. It used the measure of association odds ratio whit the CI 95% (calculated whit https://www.medcalc.org/calc/odds_ratio.php).

Results: this sample accounts for 311 patients, mainly men (79.7%) with mortality of 6.43% (20 patients). About 73.6% of patients were hospitalized for acute exacerbation of COPD (AECOPD) caused by infection. About 45% had more than one hospitalization in the last year, 50.16% used chronic domiciliary oxigenotherapy and 27% domiciliary non-invasive ventilation (NIV). Approximately 31.2% of these patients required NIV during hospitalization and 3% required mechanical ventilation (MV) with a mortality rate of 12.4% and 33.3% respectively. The main comorbidities identified in survivors were arterial hypertension - 58%, heart failure - 56% and anxiety - 15%. The most identified comorbidities in patients who died were the arterial hypertension - 80%, the heart failure - 70% and fibrillation/atrial flutter - 40%. The fibrillation/atrial flutter (OR 3.95 CI 1.5248-10.2451 p 0.0047), the need of NIV during hospitalization (OR 3.63

CI 1.4349-9.2101 p 0.0065) and health care associated infections (OR 5.81 CI 2.0145-16.7404 p 0.0011) are associated with increased mortality. Chronic domiciliary oxigenotherapy is associated whit less mortality (OR 0.22 IC 0.0868-0.5802 p 0.0020).

Conclusions: The majority of patients hospitalized for AECOPD were men; the exacerbation was mainly due to respiratory infection. It was found that it is usual to have more than one hospitalization per year in patients with COPD. Health care associated infections, fibrillation/atrial flutter, use of NIV and MV during hospitalization seems to increase mortality.

Key words: Chronic obstructive pulmonary disease. Risk factors. Mortality.

CO 009. DOMICILIARY NON-INVASIVE VENTILATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE - RETROSPECTIVE STUDY-

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Non-Invasive Ventilation (NIV) is a well-established treatment for acute hypercapnic exacerbation of Chronic Obstructive Pulmonary Disease (COPD) improving morbidity and mortality. However, the benefit of its use in patients with COPD and chronic hypercapnic respiratory failure keeps still controversial. This study will characterize the population of patients with COPD who perform domiciliary NIV and will evaluate the utility of this therapy. The authors conducted a retrospective study through the consultation of medical records and carried out a retrospective evaluation of the following parameters: gender, age, weight, body mass index, smoking history, dyspnoea quantified according to Modified Medical Research Council (mMRC) scale, arterial oxygen pressure (PaO₂), arterial carbon dioxide pressure (PaCO₂), hematocrit, forced expiratory volume in first second (FEV₁), total lung capacity (TLC), residual volume (RV), NIV adherence, ventilation mode, respiratory rate, inspiratory pressure (IPAP), expiratory pressure (EPAP), long-term oxygen therapy, exacerbation admissions, resource to emergency services, first year and third year mortality. The authors evaluated 35 clinical processes, having been excluded 18 patients with overlapping COPD/Obstructive Sleep Apnea Syndrome (OSAS) and 1 patient to have undergone lung transplantation. They were included 16 patients with global respiratory insufficiency COPD with an average age of 68 years. Most are male (81%), ex-smokers with a smoking history greater than 60 pack units/year and have very serious obstruction - FEV₁ below 30%. The most widely used ventilation mode was the bilevel (average IPAP: 19 cmH₂O; average EPAP: 6 cmH₂O; average respiratory rate 18 breaths/minute). It has been found generally good adherence to home NIV (average use per day of 9.84 hours), and after the introduction of NIV where observed in the vast majority of patients gasometric significant improvement, fewer hospital admissions due to COPD exacerbation and lower use of emergency services. The mortality rate within the first NIV year was 19% and 25% to 3 years. As in other studies, the authors found a good adherence to NIV, reduced use of health services supporting that this chronic therapy could have benefits in patients with chronic respiratory failure COPD.

Key words: Domiciliary non-invasive ventilation. Chronic ventilation. Chronic obstructive pulmonary disease.

CO 010. IMMIGRATION AND TUBERCULOSIS IN THE PULMONOLOGY DIAGNOSTIC CENTER OF VENDA NOVA OVER A PERIOD OF FIVE YEARS

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Introduction: Immigrants are at increased risk for tuberculosis, with an estimated incidence 4 times higher than the general population. Particularly, the Pulmonology Diagnostic Center of Venda Nova (PDCVN) is located in one of the zones with a greater immigration territorial index of the Lisbon Metropolitan Area.

Objective: To evaluate retrospectively the tuberculosis cases in immigrants of the PDCVN from 2009 to 2013, comparing the results with tuberculosis data from the non-immigrants of the same Center and from the nationwide immigrants.

Methods: We used the Tuberculosis Surveillance System (SVIG-TB) for the collection and analysis of demographic and clinical data.

Results: Between 2009 and 2013, the PDCVN had a total of 863 tuberculosis cases, being 401 (46,5%) in immigrants (62% male, mean age 39 years), mainly coming from the former Portuguese colonies (30% Cape Verde, 27% Guinea-Bissau, 22% Angola); 87% were living in Portugal for more than two years. Of the 401 immigrants, 89% were new cases and 11% relapses, compared with 9% of relapses in non-immigrants. The presentation form was pulmonary (PT) in 64% of immigrants and 69% of non-immigrants, with confirmation of 82% for both groups. The coverage rate for the drug sensitivity tests (DST) was similar for immigrants and non-immigrants (94%) as well as cases of multidrug resistance (2% versus 1,6%). Directly observed treatment (DOT) in cases of PT with a positive direct examination of sputum (D+) was higher in immigrants (87% versus 80% for non-immigrants). There were 85% of therapeutic success and 7,5% of dropouts, which were worst results comparing to the non-immigrants (91% of success and 3,5% of dropouts). Regarding to other risk factors, we found that 23% of immigrants had AIDS and 6,5% had drug addiction, which in non-immigrants were respectively 15% and 17%. Comparing to national data for the same period, there were only 15,8% of tuberculosis cases in immigrants. In these, there were 93% of new cases and 7% of relapses, being 69% pulmonary forms with a confirmation rate of 77%. The coverage rate of DST at a national level was 87%, with 5% cases of multidrug resistance; DOT in PT D+ cases was 79%.

Conclusions: The proportion of tuberculosis cases in immigrants from the PDCVN is very high. Although this is a group with an increased risk, we found a very good confirmation rate and therapeutic success, higher than the national data. Being this a group with higher dropout rates, we emphasize the importance of knowing their characteristics, with the aim of developing strategies to achieve better results.

Key words: Tuberculosis. Immigration.

CO 011. PULMONARY TUBERCULOSIS IN A PORTUGUESE CANCER CENTER

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Introduction: Tuberculosis (TB) and lung cancer can coexist. Lung cancer can abut areas of old tuberculous foci or be a consequence of an old tuberculous scar tissue containing viable tubercle bacilli. Clinical and radiologic presentation does not allow a differential diagnosis.

Objective: Establish the differential diagnosis of pulmonary tuberculous and oncologic diseases and assess the impact of tuberculosis diagnostic in the treatment of cancer patients.

Methods: Retrospective analysis of medical records of patients followed in a Portuguese Cancer Center between 01/01/2003 and 31/12/2012, to find out the frequency for confirmed or suspicion of cancer and diagnosis of mycobacterial infection as carried out by flexible bronchoscopy.

Results: A total of 140 patients, 103 patients in follow-up for oncological disease and 37 patients without confirmed oncologic disease, 20 patients referred for differential diagnosis between TB

infection and cancer and 17 patients for cancer suspicion, which was only confirmed in one case. Among oncologic patients head and neck, lymphoproliferative disorders and larynx cancer dominated. Acid-fast staining and cultures of bronchial secretions were used for mycobacteria search. Nine patients had simultaneous diagnosis of lung cancer or lung metastasis and mycobacterial infection. Cancer treatment was delayed or modified in 11 patients (8%) after TB infection diagnosis. 18 patients (13%) deceased before results became available and did not initiate TB therapy.

Conclusions: Facing a clinical and radiological suspicion of lung cancer, investigation of a primary or a coexistent TB can be neglected. We concluded that the diagnosis of TB had little impact on the treatment scheduled for oncological diseases.

Key words: Lung tuberculosis. Lung cancer. Differential diagnosis.

CO 012. NONTUBERCULOUS MYCOBACTERIAL DISEASE IN PORTUGAL: ISOLATION FREQUENCY, CLINICAL RELEVANCE, GEOGRAPHICAL DISTRIBUTION AND PREDICTORS

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Introduction: The increase of Nontuberculous mycobacteria (NTM) is being reported in many studies. This increase is thought to be most pronounced in countries where the incidence of mycobacterium tuberculosis is declining. It's important to study the prevalence of isolation of NTM so that the epidemiologic features of these pathogens can be better understood.

Objective: The aim of this work is to assess the isolation frequency, clinical relevance, geographical distribution and predictors of NTM disease treated in Portugal.

Methods: We performed a retrospective study, obtaining information of all NTM cases, reported between 01/01/2002 and 31/12/2012, from the SVIG-TB archive. All patients who started NTM treatment were classified as cases. The variables under analysis included gender, age group, address (district), origin (native or immigrant), site of disease (pulmonary or extrapulmonary), comorbidities (acquired immune deficiency syndrome [AIDS], chronic obstructive pulmonary disease [COPD], interstitial lung disease [ILD], diabetes, malignancy, chronic liver disease, chronic renal failure, alcoholism, intravenous drug abuse) and homelessness. The measure of association between each NTM specie and each potential risk factor, was reported by odds ratio (OR) and the 95% confidence intervals (95% CI). Each potential risk factor was evaluated using logistic regression models.

Results: We found 632 patients with NTM disease. From these, 381 (60.3%) were men and 251 (39.7%) women, with median ages of 54 and 58 years, respectively. Most of them were native (n = 572; 90.5%). Mostly of NTM cases were pulmonary (n = 612; 96.8%). The microbiological isolation was done: in pulmonary disease 468 (74.1%) from sputum and 144 (22.8%) from bronchoalveolar lavage; and in extrapulmonary disease, 9 (1.4%) from blood, 6 (0.9%) from lymph node aspirate and 5 (0.8%) from organ biopsy. In descending order, the geographical distribution of NTM was: Lisbon (n = 166; 26.3%), Oporto (n = 155; 24.5%), Setúbal (n = 82; 13.0%), Viseu (n = 60; 9.5%), Aveiro (n = 26; 4.1%), Braga (n = 26; 4.1%) and others (n = 117; 18.5%). *M. avium* complex (MAC) was the most frequent isolate, followed by *M. kansasii*, *M. goodii*, *M. xenopi*, *M. fortuitum*, *M. chelonae* and others. The annual number of NTM cases rose during our research period, mainly owing to an increase in MAC isolates. The multivariate analysis, showed that women (adjusted OR = 1,61; 95% CI: 1,15-2,27; p = 0,006), AIDS (adjusted OR = 2,86; 95% CI: 1,79-4,57; p = 0,000) and patients older than 55 years (p < 0.05) were risk factors for MAC disease. Homelessness

was a risk factor for *M. kansasii* disease (adjusted OR = 3,95; 95% CI: 1,28-12,16; p = 0,017).

Conclusions: This study, gives nationwide information about NTM in Portugal. It is important to be aware to the increase of NTM, in order to better train health care workers.

Key words: *Nontuberculous mycobacteria. Portugal. Geographical distribution. Predictors.*

CO 013. EFFECTIVENESS OF LATENT TUBERCULOSIS TREATMENT - THE EXPERIENCE OF A TUBERCULOSIS AMBULATORY CENTER

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Introduction: Diagnosis and treatment of latent *Mycobacterium tuberculosis* infection (LTBI) can reduce the risk of progression to the active form of the disease. Effective treatment regimens for *Mt* infection are approved by national and international guidelines. In Portugal, the recommended regimen is isoniazid for 9 months.

Objective: To evaluate the effectiveness of the indication for LTBI treatment in contacts of patients with recent bacilliferous tuberculosis diagnosis.

Methods: Retrospective analysis of patients recently diagnosed with bacilliferous pulmonary tuberculosis and their contacts, in an ambulatory tuberculosis center, within two years.

Results: 138 contacts were identified, 74 of which with LTBI criteria. Among these, 38 (51.4%) completed treatment. In this group, there were no cases of active disease in the following two years. From the remaining 36, 20 refused treatment and 10 did not completed it. In this group, there were 6 cases of progression to pulmonary tuberculosis (16.7%).

Conclusions: LTBI treatment if effective and all efforts should be done to implement it.

Key words: *Tuberculosis. Contacts. Screening.*

CO 014. CENTRAL NERVOUS SYSTEM (CNS) TUBERCULOSIS - CASE STUDY IN PATIENTS INFECTED WITH HUMAN IMMUNODEFICIENCY VIRUS (HIV)

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Introduction: CNS tuberculosis is a clinical entity with high mortality and morbidity which may manifest itself in different ways. Tuberculosis patients infected with HIV are more susceptible to the development of extra-pulmonary manifestations and have a 5 fold greater risk of CNS involvement compared to seronegative patients which leads to a more complex treatment of the underlying immunosuppression and CNS infection. Our study aims to characterize this entity in Portugal.

Objective: Clinical and epidemiological characterization of CNS tuberculosis in HIV patients over a period of 15 years.

Methods: Patients with the diagnosis of CNS tuberculosis and HIV infection admitted to the Respiratory Infectious Disease Service at Hospital Pulido Valente during the period from January 2000 to July 2015 were included. Patients were divided into two groups according to the immune status (A: CD4+ lymphocytes less than 50 cells/mm³ and B: CD4+ lymphocytes greater than or equal to 50 cells/mm³) for comparison of clinical and epidemiological variables.

Results: From a total of 787 patients diagnosed with tuberculosis and HIV infection, 22 (2.8%) had CNS tuberculosis. The mean CD4+ lymphocytes in these patients were 88.9 ± 85.5 cells/mm³ and most patients (81.8%) had less than 200 cells/mm³. Nine (40.9%) patients had less than 50 cells/mm³. Ten (45.5%) patients had tuberculous meningitis, 8 (36.4%) cerebral tuberculosis and 4

(18.2%) tuberculous meningitis and cerebral tuberculosis. Thirteen (59.1%) patients had pulmonary tuberculosis and 9 (40.9%) miliary tuberculosis. The main form of presentation was tuberculous meningitis in patients with CD4+ < 50 cells/mm³ (77.8%) as well as in those with CD4+ ≥ 50 cells/mm³ (53.8%). There was no evidence of drug resistant tuberculosis (TB) in most patients (77.3%). There was resistance to one of the drugs in three (13.6%) patients, resistance to two (without MDR-TB criteria) in one and XDR-TB in another. Five (22.7%) patients developed adverse reactions to the antituberculosis drugs - two (9.1%) had cutaneous manifestations and 3 (13.6%) hepatic toxicity. The majority of the patients developing adverse reactions had CD4+ lymphocytes < 200 cells/mm³ (80%). Infections with AIDS defining criteria were present in 5 (22.7%) patients. Eight (36.4%) patients died during hospitalization. There were no statistically significant differences between groups regarding forms of presentation of CNS and pulmonary tuberculosis, presence of infections with AIDS defining criteria, drug resistance, development of adverse reactions and mortality.

Conclusions: In this study no correlation was found between the immune status of the patients and the analyzed variables namely form of presentation of CNS and pulmonary tuberculosis, presence of infections with AIDS defining criteria, drug resistance, development of adverse reactions and mortality.

Key words: *Tuberculosis. Central nervous system. Human immunodeficiency virus. CD4+.*

CO 015. FIBREOPTIC BRONCHOSCOPY: THE MICROBIOLOGICAL WINDOW

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Introduction: Fiberoptic bronchoscopy (FB) is a diagnosis method with low morbidity that allows collecting samples of the respiratory tract being crucial to the diagnosis of a range of infectious diseases. In pneumonia, FB is indicated in cases of severe clinical presentation, patients in intensive care units, immunocompromised, patients without sputum, inadequate response to empirical treatment, slow resolution of pneumonia and pneumonia associated with ventilation. Tuberculosis deserves special attention and the BF is an ally in case of strong clinical suspicion without the capacity to produce respiratory specimens.

Objective: description and analyze the diagnostic yield of FB held in patients suspected to have a respiratory infection in Respiratory Endoscopy Sector of Egas Moniz Hospital from June 2014 to May 2015 (12 months).

Methods: Retrospective review of reports and analytic results of patients undergoing FB. The authors analyzed: demographics, provenance of patients, indications categories, diagnostic yield, microbiological results.

Results: 118 FB were done; of which 80 (67.8%) were male patients. The average age was 59.6 (minimum age 22, maximum age 93). The FB were requested by: Pulmonology Department (48; 40.7%), Infectiology Department (23; 19.5%), Internal Medicine Department (23; 19.5%), others (24, 20.3%). The suspected diagnosis that motivated the performance of FB were: pneumonia 61 patients, pulmonary tuberculosis 36 patients, recurrent respiratory infection 8 patients, pneumocystosis 7 patients, fever of unknown origin 36 patients and pulmonary aspergillosis in 2 patients. The majority (81.4%) of FB performed showed no visible changes. The FB contributed to the diagnosis in 43 (36.4%) patients. In 22 patients were isolated bacteria in bronchial washings culture [(BW) (21 cases)] and bronchoalveolar lavage culture [BAL (10 cases)]. The following agents were identified: Haemophilus influenzae 5 cases, Staphylococcus aureus 5 cases, Pseudomonas aeruginosa 4 cases, Corynebacterium striatum 2 cases, Escherichia coli 2

cases, Haemophilus parainfluenzae 2 cases, Klebsiella pneumoniae 2 cases, Acinetobacter sp 2 cases, Streptococcus pneumoniae 1 case, Enterobacter cloacae complex 1 case and Moraxella catarrhalis 1 case. 18 patients were diagnosed with pulmonary tuberculosis (PT) by acid-fast bacilli research: direct examination and/or cultural in BW in 16 patients, direct examination and/or cultural in BAL in 11 patients and 3 positive bronchial biopsies. 8 patients had a negative direct examination of SB/BAL, and the diagnosis was made on cultural examination of the same samples. 11 (61.1%) patients diagnosed with PT had this diagnostic suspicion before the procedure. 5 (4.2%) patients (HIV +) had a diagnosis of pneumocystosis; the fungus was identified in BW and/or BAL.

Conclusions: The findings on endoscopic inspection of the airways of patients with suspected infectious diseases are usually considered nonspecific. The FB allows the identification of microbiological agents in these infections, allowing for a successfully targeted treatment. Although this is a more invasive and costly procedure is especially important when we suspect of PT, since it allows an early and definitive diagnosis, thus ensuring the effectiveness of treatment. It is imperative to request the direct examination of mycobacteria but also the cultural examination, which increases the diagnostic yield.

Key words: Infectious diseases. Microbiology. Fiberoptic bronchoscopy.

CO 016. LEGIONNAIRES' DISEASE DURING AN OUTBREAK: HOW TO MAKE A DIAGNOSIS

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Introduction: An outbreak of Legionnaires' disease (*Legionella pneumophila* serogroup 1) with 334 confirmed cases was identified in November 2014 in Vila Franca de Xira (VFX). As part of the team working in the Hospitals that cared for these patients, the authors had to reach a definition of a confirmed case of legionnaires' disease vs probable case of Legionnaires' disease.

Objective: To assess how the diagnosis was made during the outbreak of Legionnaire's disease.

Methods: We applied a questionnaire to all 53 cases of suspected or confirmed Legionnaires' disease admitted to our respiratory department. We applied the *European Centre for Disease Prevention and Control* (ECDC) classification, which was also endorsed by Direção Geral de Saúde (DGS). A confirmed case was defined as pneumonia with laboratory confirmation of *Legionella pneumophila* (Lp) (by urinary antigen test (UAT), positive culture from the respiratory tract or serological testing), symptom onset occurring after October 1st together with epidemiological link. Suspected cases were clinically similar to confirmed cases, had an epidemiological link but lacked laboratory confirmation.

Results: Of the 53 cases, 41 (77%) were confirmed cases. An urinary antigen test (UAT) was made to all 53 patients and it was positive in 36 cases (87.8% of confirmed cases). The remaining 5 cases were confirmed by serology (4) and sputum examination (1). All 12 probable cases had negative UAT and those who had respiratory tract cultures also had these negative. Within the group of probable cases, six were confirmed by two negative serology samples. It was not possible to achieve ECDC and DGS recommendations in the other six cases. Although blood cultures are not indicated for Legionnaires' disease they were performed in 38 cases (28 confirmed and 10 probable cases) without any isolation, specifically, without *Streptococcus pneumoniae* isolation.

Conclusions: UAT was the most cost effective test, with a positive result in 87,8% of the confirmed cases. Serology (4) and sputum culture (1) confirmed the remaining cases. As expected blood

cultures were not useful in this context. Legionnaires' disease outbreak in VFX was an opportunity for reviewing and improving the application of current diagnostic tools for this disease.

Key words: *Legionella pneumophila*. Outbreak. Diagnosis.

CO 017. COMMUNITY-ACQUIRED PNEUMONIA IN PATIENTS WITH LIVER CIRRHOSIS: CLINICAL FEATURES, OUTCOMES AND SEVERITY SCORES

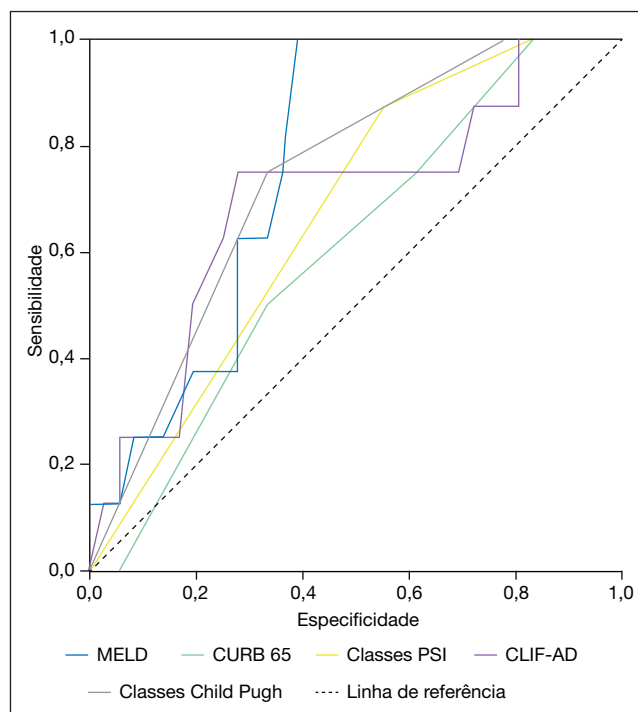
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Introduction: Community-acquired pneumonia (CAP) is the third cause of bacterial infections in patients with liver cirrhosis (LC), and represents one important reason of progression of liver failure, development of liver-related complications, and mortality in those patients. The aims of this study were to determine the clinical features, outcomes and prognostic value of several severity scores in patients with CAP and LC admitted to an Internal Medicine Department.

Methods: We performed a retrospective analysis of clinical data of patients admitted for CAP and LC during the period between January 2010 and December 2014. Prognostic value of several severity scores was performed using Receiver-Operating Characteristic (ROC) curve analysis, Areas Under the Curve (AUC) and its 95% Confidence Interval (CI).

Results: A total of 508 admissions of patients with LC were evaluated and in 67 (13.2%), pneumonia was the motive of admission (44 with CAP and 23 with health-care related pneumonia). In those with CAP, the median age was 69 years (IQR 19.7), 86.4% were male and alcoholic cirrhosis was found in 86.4% patients. The median value of the Model for End-Stage Liver Disease (MELD) was 17.5 (IQR 9.0), the median value of CLIF-Acute Decompensation Score (CLIF-AD) was 65 (IQR 12.5), and 36 (81.8%) patients were defined as grade B or C of Child-Pugh Score. 86.4% were classified in high-risk Pneumonia Severity Index (PSI) classes (classes IV and V) but only 36.3% scored more than 3 points of CURB-65 Score [confusion, urea,



respiratory rate, blood pressure, and age \geq 65 yr]. 30-day mortality was 18.2%. AUCs from liver disease-specific scores (MELD and CLIF-AD) were superior as predictors of 30-day mortality (0.764, 95% CI 0.620-0.908 and 0.696, 95% CI 0.486-0.907, respectively) than CAP severity scores, PSI and CURB-65 (0.670, 95% CI 0.490-0.850 and 0.604, 95% CI 0.408-0.800).

Conclusions: Pneumonia is an important cause of admission of patients with LC. The severity of hepatic dysfunction plays an important role in the development of adverse events and cirrhosis specific scores may be more useful for predicting and stratifying cirrhotic patients with CAP who have a high risk of severe disease, than CAP specific scores.

Key words: *Pneumonia. liver cirrhosis.*

CO 018. METAPNEUMONIC PLEURAL EFFUSION, PROGNOSIS AND MORTALITY EVALUATION

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Introduction: Pleural effusion occur in a significant percentage of patients hospitalized with diagnosis of pneumonia. According to bibliography, mortality is higher in patients with metapneumonic pleural effusion than in patients with pneumonia without this complication. This increase in mortality may be associated with incorrect approach and therapy.

Objective: To statistically compare pneumonia with metapneumonic pleural effusion with pneumonia without this complication.

Methods: Retrospective study based on clinical process of patients admitted with the diagnosis of pneumonia in a Pulmonology Department of a Districtal Hospital during one year. Data analysis was performed using SPSS 21.

Results: 274 patients were included: 37 (14%) with pneumonia with pleural effusion and 237 (86%) with pneumonia without pleural effusion. The median age was 73.70 years in patients with metapneumonic pleural effusion compared to 74.76 years in patients without metapneumonic pleural effusion. ($p > 0.05$). Of patients with pneumonia with pleural effusion, 56.8% had Community Acquired Pneumonia (CAP), 35.1% Healthcare Associated Pneumonia (HCAP) and 8.1% Intrahospital Pneumonia (IP). Of patients with pneumonia without pleural effusion, 50.6% had CAP, 35.9% had HCAP and 13.5 had IP. The mortality rate was 10.8% in pneumonia with metapneumonic pleural effusion, compared with 13.9% in pneumonia without pleural effusion ($p > 0.05$). The average number of days of hospitalization was 17.35 days in pneumonia with pleural effusion compared with 15.04 days in pneumonia without this complication ($p > 0.05$). The median number of days of antibiotic therapy was 11.73 in patients with pleural effusion, compared to 11.23 days in patients without pleural effusion ($p > 0.05$). It was necessary to change the antibiotic empirically established in 27% of patients with pleural effusion compared with 18.9% of patients with pneumonia without pleural effusion ($p > 0.05$). The radiological involvement was unilateral in 86.5% in patients with pneumonia with pleural effusion, compared to 71.3% in patients without associated pleural effusion ($p > 0.05$). **Conclusions:** There was no significant difference in hospitalization number of days, antibiotic therapy number of days, need to change of antibiotic and radiological involvement between patients with and without metapneumonic pleural effusion. The developed study seems to demonstrate that, unlike described in the literature, patients with metapneumonic pleural effusion, when compared with patients without this complication, have similar mortality rate. Adequate approach and treatment of these patients, can explain such evidence.

Key words: *Pneumonia. Metapneumonic pleural effusion. Mortality.*

CO 019. CHARACTERIZATION OF PATIENTS WITH ACOS. APPLICATION OF GINA/GOLD QUESTIONNAIRE VS SEPAR CRITERIA

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Introduction: The asthma-COPD Overlap Syndrome (ACOS) has assumed increasing relevance and has been recently recognized as a specific clinical entity. In 2012, the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR) published a consensus document which considered ACOS a COPD phenotype with asthma characteristics and with defined clinical and analytical diagnostic criteria. In 2014, the joint initiative GINA/GOLD released for the first time guidelines addressed to this entity, classifying it as a syndrome that shares a similar number of characteristics of asthma and COPD. However, there is not a consensual definition and there are very few published studies to date addressing this issue.

Objective: Identification of patients with ACOS according to the GINA/GOLD and SEPAR criteria, followed in Pulmonary Outpatient Department during 2014, at Pedro Hispano Hospital, and their clinical and functional characterization.

Methods: This study included patients over 35 years old with a history of asthma/COPD and their respective functional evaluation. Patients were then identified with ACOS through the diagnostic approach suggested by GINA/GOLD guidelines and also by SEPAR (major and minor) criteria. Since this was a retrospective study, eosinophilia assessment in sputum (one of the major criteria by SEPAR) was not performed.

Results: The diagnosis of ACOS according to the GINA/GOLD standards was recognized in 34 patients (7.4%), while the SEPAR criteria made possible the identification of 11 patients (2.4%), of a total of 462. The GINA/GOLD group had a higher mean age (61.1 vs 52.4 years) and a majority of them were male (55.9% vs 36.4%). All the patients in the SEPAR group were current or previous smokers (100% vs 85.3%). A history of atopy was more frequent in the SEPAR group (54.5% vs 29.4%). The prevalence of ≥ 1 exacerbations/hospitalizations in the last year was higher in the GINA/GOLD group (35.3% vs 27.3%). In respiratory function tests, the frequency of a severe obstruction was similar in both groups (44.1% vs 45.5%). The combined inhaled therapy of ICS plus a long-acting bronchodilator was used by the majority patients on both groups (90.9% in the SEPAR group vs 94.1% in the GINA/GOLD group).

Conclusions: There was a clear discrepancy in the number of patients identified by the SEPAR vs GINA/GOLD criteria. Regarding the SEPAR criteria, a low sensitivity/specificity has been reported as well as the difficulty on its clinical application, justified by the usual unavailability of all the necessary criteria for diagnosis.

Key words: *Asthma. COPD. ACOS. SEPAR. GINA/GOLD.*

CO 020. ASTHMA AND LUNG STRUCTURAL CHANGES - THE ROLE OF COMPUTED TOMOGRAPHY

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Introduction: Asthma is characterized by chronic airway inflammation which can lead to airway remodeling. Computed tomography (CT) of the chest, especially "high-resolution CT", can detect structural changes in the airways and their effects on the lung parenchyma, and other comorbidities. The indications for performing CT are set to severe asthma, but its application in all other cases varies between centers. Recent studies have evaluated the CT's ability to detect structural changes associated with asthma and its clinical implications.

Objective: Evaluation of lung structural changes detected by CT in asthmatic patients and their clinical and functional impact.

Methods: Retrospective study of asthmatic patients followed in "Pulmonology-asthma" consultation in 2014 with thoracic CT requested by this consultation. Demographic data were collected, asthma features (evolution time, atopy, forced expiratory volume in 1 second-FEV₁, exacerbation, symptomatic control level and treatment "step" according to GINA 2015), comorbidities and indications for CT. The chest CT were analyzed qualitatively, according to the alterations found the sample was divided into 4 groups (1-"No changes"; 2-"Changes associated with asthma"; 3-"Changes associated with asthma and others"; 4-"Others changes") and performed a comparative analysis.

Results: Were analyzed 171 patients (18,2% of patients followed in the consultation), 69% women, mean age 52,4 ± 14,2 years, 12,3% smokers, 19,3% ex-smokers and documented atopy in 48%. The main comorbidities were rhinosinusitis/nasal polyps (56,1%) and obesity (39,8%). They had other respiratory diseases 35,7% of the patients (31% bronchiectasis). Regarding to treatment "step", 12,3% were in the "step 1", 5,3% in the "step 2", 43,3% in the "step 3", 34,5% in the "step 4" and 4,7% in the "step 5". The high-resolution CT was used in 95,9% of cases, and the main indication was difficult to treat/severe asthma (32,7%). They were identified direct or indirect signs of airways disease in 43,3%, consisting of bronchiectasis (31%), bronchial wall thickening (18,1%), mucoid impaction (7%), air trapping (6,4%), mosaic attenuation (2,3%) and thick linear opacities (0,6%). In 69,6% of cases there were other changes, more often nodules/micro-nodules (33,9%) and sequelae changes (32,2%). Group 1 (17,5% of cases) presented a lower age (mean 40 ± 14,2, p < 0,001), higher FEV₁ (mean 90,8 ± 16,6, p = 0,008), fewer exacerbations (mean 0,5 ± 0,7, p < 0,001) and a lower treatment "step" (p = 0,003). In Group 2 (11,7% of cases) there were no statistically significant differences. Group 3 (25,7% of cases) was associated with older age (mean 56,1 ± 12,8, p = 0,042), other respiratory disease (p < 0,001), asthma duration ≥ 10 years (p = 0,031) and lower FEV₁ (mean 73,25 ± 25,5, p = 0,001). Group 4 (45,1% of cases) was associated with higher age (mean 55,3 ± 12,8, p = 0,015).

Conclusions: CT detected structural changes related to asthma and a number of other changes, highlighting the coexistence of bronchiectasis. The exclusive presence of asthma-related changes had no impact on clinical and functional terms, although it was the least represented group. Only when co-existed other changes was found association with airflow limitation reinforcing the importance of comorbidities in the asthmatic patients approach and the role of CT in its detection.

Key words: Asthma. Computed tomography. Structural abnormalities. Pulmonary function.

CO 021. OMALIZUMAB IMPACT IN THE TREATMENT OF SEVERE ASTHMA IN OBESE PATIENTS

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Introduction: Asthma worldwide affects about 300 million individuals, representing severe asthma 5-10% of these patients. Patients with uncontrolled severe asthma have reduced therapeutic options, a high morbidity and mortality risk and are the most responsible for the expenses associated with health care due to asthma. Obesity has become a public health problem associated with the risk of asthma. The Global Initiative for Asthma (GINA) defines asthma as a chronic inflammatory airway disease, this inflammation worsens in cases of atopy. Immunoglobulin E (IgE) is

	T0	T4	T12
ACT (mean ± standard deviation)	10,5 ± 1,1	23,2 ± 4,9 (p = 0,000)	24,0 ± 4,1 (p = 0,000)
FEV ₁ (mean ± standard deviation)	53,9 ± 10,5	62,3 ± 14,8 (p = 0,022)	65,6 ± 10,1 (p = 0,001)
Equivalent budesonide daily (µg) (mean ± standard deviation)	1509,5 ± 699,7	1132,6 ± 728,2 (p = 0,011)	665,5 ± 332,9 (p = 0,002)

an important media-tor in the inflammation cascade. Omalizumab is a humanized monoclonal antibody that binds circulating IgE, inhibiting IgE mediated inflammatory cascade which is indicated for the treatment of severe allergic asthma.

Objective: Assess the impact of treatment with omalizumab, in obese patients with severe asthma, in terms of disease control, FEV₁ and inhaled corticosteroid dose daily.

Methods: Retrospective study of patients diagnosed with severe asthma, followed in a reference hospital and treated with omalizumab. Demographic variables, smoking history, comorbidities, total IgE and sensitivity pattern were assessed. The subgroup of obese patients (BMI ≥ 30 kg/m²) was analyzed in terms of: inhaled corticosteroid daily dose, forced expiratory volume in 1st second (FEV₁) and result of asthma control test (ACT), at the beginning of treatment with omalizumab (T0), 4 (T4) and 12 months (T12) of treatment. Statistical analysis performed with T-student test for paired samples.

Results: Were analyzed 34 patients, 25 women (73.5%), mean age 52 ± 10 years, body mass index (BMI) 30.1 ± 5.1 kg/m². Had smoking history 8 patients (23.5%). The most frequent comorbidity was rhinitis (26 patients [76.5%]), followed by sinusitis and nasal polyposis (both with 7 cases [20.6%]). The mean total IgE was 497.4 ± 635.3 kU/L. The sensitivity pattern was, in descending order: mites (n = 16; 47.1%), mites + appendages (n = 4; 11.8%), mites + pollens (n = 3; 8.8%), pollen (n = 2; 5.9%) and mites + pollen + appendages (n = 1; 2.9%). Six patients (17.6%) did not have atopic asthma. The mean dose of omalizumab was 426 ± 236 mg/month. Of the 34 patients, 19 were obese (mean BMI 33.4 ± 4.1 kg/m²) - Mean ACT, mean FEV₁ and equivalent daily dose of budesonide, at T0, T4 and T12, is described in the table. None of these patients experienced adverse drug reactions to omalizumab. At 12 months of treatment, obese patients have a significantly lower FEV₁ than non-obese patients (65.6 vs 82.8; p = 0.020).

Conclusions: This study demonstrates that in obese patients with severe asthma, treated with omalizumab there is a significant improvement in disease control and FEV₁. And, a significant reduction in the daily dose of inhaled corticosteroid. Thus, we can conclude that omalizumab is an effective and safe drug in the treatment of severe asthma in obese patients.

Key words: Severe asthma. Omalizumab. Obesity.

CO 022. RELATION BETWEEN EXERCISE-INDUCED BRONCHOCONSTRICTION, EXHALED NITRIC OXIDE, IGE LEVELS AND ATOPY

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Introduction: Exercise-induced bronchoconstriction (EIB) describes the acute airway narrowing after exercise. EIB may be present in

40-90% of asthmatic patients, but can also occur in non-asthmatic subjects with a prevalence of 8-20%.

Objective: To determine the relationship between levels of exhaled nitric oxide, total IgE levels and atopy and EIB in patients with clinical suspicion.

Methods: We conducted a retrospective study involving 129 patients with clinical suspicion of EIB followed in a central hospital who underwent bronchial provocation test with running (R) between January/2012 and June/2015. Sociodemographic characteristics, forced expiratory volume in 1 second (FEV1%), FEV1 and forced vital capacity ratio (FEV1/FVC), result of bronchial provocation test with methacholine (MT), exhaled nitric oxide levels (eNO), running test result, total IgE levels, atopy, eosinophilia and asthma diagnosis were recorded. A positive running test and consequently the diagnosis of EIB was defined as a decrease of FEV1 \geq 10% within 30 minutes after exercise. We compared positive running test patients (R+) with negative running test patients (R-).

Results: We included 129 patients, with a median age of 15 years (min-max 6-54 years); 55.8% females (n = 72); 89.1% non-smoking (n = 115), mean body mass index (BMI) 22.5 ± 4.3 kg/m². The confirmed diagnosis of asthma was present in 46.5% of patients (n = 60); 66.7% (n = 86) had atopy; 9.5% (n = 11) eosinophilia, IgE and eNO medians were 135 IU/ml (min-max 2-1986 IU/ml) and 29 ppb (min-max 4-124 ppb), respectively. The mean baseline FEV1 was $101 \pm 15\%$ and mean FEV1/FVC was $85 \pm 7\%$. MT was performed in 33 patients (36%) and was positive (MT+) in 12. Running test was positive in 30.2% (n = 39) of patients with FEV1 median decrease of 14% (min-max 10-34%). We did not find statistically significant differences between patients with R+ and R- respecting to age, gender, BMI, changes in lung function, MT+, eNO and IgE levels, history of atopy, confirmed asthma or eosinophilia. Within the group of patients with confirmed asthma (n = 60) 36.7% had R+. There were no statistically significant differences between asthmatic patients with R+ versus asthmatic with R- respecting the analyzed variables. Regarding patients without a confirmed diagnosis of asthma (n = 69) 24.6% had R+. The median eNO was 35 ± 28 ppb for those with R+ and 17 ± 21 ppb for those with R- (p = 0.014).

Conclusions: Globally and in the group of patients with a confirmed diagnosis of asthma we did not find any relationship between eNO levels, IgE levels and atopy and EIB. Although other studies describe higher levels of eNO in asthmatic patients with EIB, this wasn't the case in this study. In patients without a confirmed diagnosis of asthma the eNO levels were higher in those with EIB.

Key words: Exercise-induced bronchoconstriction. Asthma. Atopy.

CO 023. FORCED OSCILLATION TECHNIQUE VS PLETHYSMOGRAPHY BODY

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Introduction: The forced oscillation technique (FOT) has complementary characteristics to the classical methods of lung evaluation. It presents a high potential for diagnostic use. However it is not yet sufficiently widespread. This paper presents some examples of applications in patients with COPD, OSA, SRVAS and Asthma. The FOT can contribute to a more detailed examination and facilitate the realization of pulmonary function tests. Resistance (Raw) results from the ratio of the pressure difference in the mouth and alveolar pressure and the flow rate measured at the mouth. The airway resistance depends on the type of flow, the dimensions of the airways and the gas viscosity. In practice, the flow is determined directly by measuring the difference pneumotachography mouth pressure and the pressure in the alveoli

is inferred from pressure changes in the plethysmography chamber. Another technique used is the Forced Oscillation (FOT), which does not use the respiratory muscles as a source of strength, but an external sound generator, which produces flow fluctuations to spontaneous breathing, to analyze, then, the resulting pressure response. This method has a high potential for diagnostic use. Both methods have the advantage of not requiring the same level of cooperation requiring the forced expiratory maneuvers.

Objective: To compare the measurement results of Raw by plethysmography and FOT to confirm reliability.

Methods: A retrospective non-randomized study and 20 patients who had body plethysmography and TOF in the Pulmonary NCEA service in August 2015. In order to study their exams were consulted.

Results: Of the 20 subjects, 13% were male and 7% female. The study population had a mean age of 63.1 years. The value obtained by FOT is in accordance with the pathophysiological principles involved. The resistance was presented with higher values in patients with pathology than in healthy patients. Another important finding obtained by TOF was the expiratory flow limitation, which had a direct bearing on the forced expiratory volume at 1 second (FEV1) obtained by plethysmography.

Conclusions: The FOT has shown great potential in the pulmonary mechanics of patients. It is a simple to perform examination and noninvasive which makes this technique useful in children and the elderly as a complement to traditional exams. Yet it is still used in research environment.

Key words: Plethysmography. Forced oscillation technique. Diagnostics. Respiratory Pathophysiology.

CO 024. CONTINUOUS POSITIVE AIRWAY PRESSURE TREATMENT ADHERENCE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME

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Introduction: Continuous positive airway pressure (CPAP) is the treatment of choice for patients with moderate to severe obstructive sleep apnea syndrome (OSAS). Poor adherence to CPAP is widely recognized as a significant limiting factor in treating OSAS. **Objective:** To evaluate CPAP treatment adherence in a group of patients with moderate or severe OSAS, one year after the beginning of therapy.

Methods: Retrospective study in which clinical and sleep study data were obtained from 126 consecutive adult patients, who attended the Sleep Unit of Pneumology Department by suspicion of OSAS and were diagnosed with moderate or severe OSAS [Apnea-Hypopnea Index (AHI) > 15] between October/2012 and January/2014. The diagnosis of OSAS was made either by polysomnography (PSG) or polygraphy (PG). The presence of symptoms, comorbidities and pharmacotherapy at the time of diagnosis were evaluated. The degree of sleepiness was assessed using the Epworth Sleepiness Scale (ESS), and somnolence was defined as ESS \geq 10. We excluded patients (n = 26) with other sleep disorders, chronic respiratory failure and absence of Epworth Sleepiness Scale (ESS) data. Data from follow up visit (approximately one year after) was collected, including the treatment adherence, clinical situation (with regard to main complaints before treatment), secondary effects and changes in the equipment. Compliance to CPAP (reading CPAP's card download) was defined as time use greater than 4h/night, the mean value of at least 70% of nights and patients were divided in compliant and non-compliant. We compared demographic and clinical variables between the compliant and non-compliant

patients using the Chi-square test or the Fisher's exact test for categorical variables and the Student's t-test for continuous variables.

Results: 100 patients were evaluated, 67% male, with mean (SD) age of 59,24 (13,14) years, BMI 33,29 (7,04) kg/m² and ESS 7,24 (4,07). 66 patients were assessed by PSG and 34 by PG with mean (SD) AHI of 37,42 (19,39) and 34,09 (18,16) respectively. Regarding to comorbidities, 74% of this population had cardiovascular disease (CVD), hypertension was the most common diagnosis (72%), followed by dyslipidaemia (45%), diabetes (27%), rhinitis/sinusitis (24%) and COPD/asthma (18%). Among all patients, 70 accepted and used CPAP treatment for at least one year, 43 (61%) of them with good compliance. We found a difference in the mean age of the compliant 63,58 (9,78) and non-compliant 56,44 (13,98) patients ($p < 0.05$) and we also found a relationship between the presence of somnolence and CPAP adherence ($p < 0.05$). The prevalence of hypertension was similar in both groups but among the group of compliant patients there was a higher prevalence of other CVD diagnostics (stroke, heart failure, arrhythmia, or ischaemic heart disease) ($p < 0.05$).

Conclusions: In this group of patients, compliance to CPAP therapy after one year was low. It's difficult to predict adherence based on clinical and sleep study data. The presence of somnolence was associated with higher CPAP therapy adherence.

Key words: Obstructive sleep apnea. Adherence.

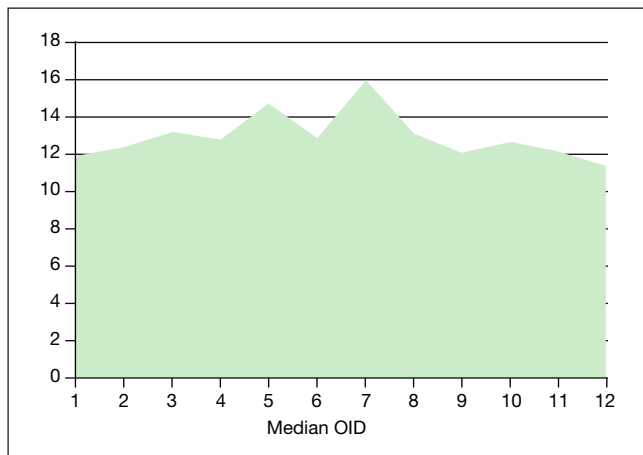
CO 025. SEASONAL IMPACT ON SLEEP APNEA. A ROLE FOR TEMPERATURE? A STUDY OF THE EUROPEAN SLEEP APNOEA DATABASE GROUP

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Introduction: In the last years there is an increasing concern in public health regarding the possible harmful impact of pollution and other environmental factors. However, the knowledge if ambient factors have any effect on sleep and sleep related breathing disorders is scarce. We analysed in a large cohort study the European sleep apnoea database (ESADA) the seasonal impact on respiratory parameters during sleep.

Methods: From the European Sleep Apnoea Database a total of 13,773 patients from 18 countries were included. To analyse the seasonal effect on sleep apnoea the apnoea/hypopnoea index (IAH and oxygen desaturation index (ODI) was calculated for each



month of the year. Furthermore we reanalysed the results dividing the sleep centres in a either northern or southern located group. All Southern countries (Portugal, Spain, Italy and Greece) used air conditioner in the sleep laboratory during summer time while most of the more northern countries did not. All results were computed by using the SPSS software version 20.

Results: Pairwise comparison demonstrated that the month July showed a significant higher AHI and ODI with a median of 21.5/h and 16.30/h, respectively (fig.). There was a clear onward trend to the hotter months with exception of May with an usual high (AHI 19.0/h) and June with a comparative low AHI (17.4/h). The number of included patients in July was slightly lower in July (6.9% of the total) compared to the other months but not significantly lower than in August (7.3%) or December (7.6%). There was no significant holiday related selection of the patients reported. The seasonal effect was more pronounced in the northern countries while in the southern only the ODI reached a statistical significant value during July.

Conclusions: We could demonstrate in a large cohort that the obstructive respiratory disturbances in sleep show a seasonal trend. Although we have no objective measurement of the ambient factors one of the possible influence to consider is the rise in temperature during the summer months. The use of air conditioner during the sleep studies used in the south might be considered a confounding factor and requires further analysis.

Key words: Apnea. Ambient factors. Sleep.

CO 026. FATIGUE IMPACT IN OSAS PATIENTS

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Introduction: The Obstructive Sleep Apnea Syndrome (OSAS) is associated with excessive daytime sleepiness, decreased quality of life and, in many cases, intense fatigue. Goal: Assess the impact of fatigue in patients with OSAS.

Methods: Patients referred to sleep polygraphy between April and December 2014 were invited to complete the Modified Fatigue Impact Scale (MFIS). Anthropometric and demographic data, comorbidities, Apnea-Hypopnea Index and Epworth Sleepiness Scale were evaluated. Statistical analysis was performed using SPSS 17. The study was approved by the Ethics Committee.

Results: We studied 260 patients, 153 were male (59%) and 107 females (41%) with a mean age of 54.8 years. The Body Mass Index (BMI) was significantly higher in females, which showed a mean value of 38.08 kg/m² vs of 31.14 kg/m² in men. Sixty-three percent of patients were obese. There was a high prevalence of comorbidities (74.6% of subjects had at least one comorbidity), being the most common: hypertension (67.5%), other heart disease (18%), diabetes mellitus (27%) and respiratory disease (23%). The Epworth Sleepiness Scale showed significant scores in 102 patients (39%), without significant differences between genders. We observed a significant fatigue score in 44% of subjects and higher values in females with an average score of 42, compared to males who averaged 31. There was an AHI > 5 events/hour in 76% of patients, with a mean AHI higher in males (21 vs 12/hour). We found that patients with higher scores of sleepiness had higher values of fatigue. There was, however, no correlation between these scores and the presence of comorbidities, BMI or AHI.

Conclusions: In our sample, there was a high prevalence of fatigue assessed by Modified Fatigue Impact Scale. There was a positive correlation between fatigue and sleepiness without relation with AHI, BMI or comorbidities. The authors conclude that further tools are needed to assess patients with sleep disorder breathing disorder.

Key words: *Fatigue. Sleep apnea obstructive syndrome. Sleepiness.*

CO 027. POLYSOMNOGRAPHY IN CHILDREN - THE EXPERIENCE OF A SLEEP LABORATORY

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Introduction: Most common sleep respiratory disturbances in children are primary snoring, upper airway resistance syndrome and obstructive sleep apnoea syndrome (OSAS). OSAS in children is characterized by prolonged partial upper airway obstruction and/or intermittent complete obstruction that disrupts normal ventilation and sleep patterns. The estimated prevalence is 1 to 5%, many children being between 2 and 6 years old. The symptoms depend on the child's age. If younger than five, snoring is most common. Other symptoms are paradoxical rib-cage movement, diaphoresis, neck hyperextension, frequent awakenings and enuresis. Growth abnormalities, neurologic disorders and cor pulmonale are severe complications that can occur. Polysomnography (PSG) is the gold standard for the diagnosis. However, there are few sleep laboratories available with paediatric expertise.

Objective: To describe our clinical experience in PSG performed in children.

Methods: Retrospective study of children (< 18 years) who underwent PSG between 2007 and 2014. Scoring of respiratory events was made in accordance with the recommended criteria of the American Academy of Sleep Medicine. Subjects with an apnoea/hypopnoea index (AHI) ≥ 1 were defined to have OSAS.

Results: One hundred and twenty two subjects were identified: 80 boys (65.6%), mean age of 7.5 years old (minimum 2, maximum 17). Children were referenced by: Pediatrics in 45% of cases, Otorhinolaryngology in 21.3%, Child Psychiatry in 11.5% and General Practice in 10.7%. Specialities from another hospital referenced the remaining cases. PSG was performed for suspected OSAS (82%), exclusion of OSAS in children with suspected attention deficit hyperactivity disorder (ADHD) and with epilepsy (9% and 1.6%, respectively), study of insomnia (0.8%), suspicion of parasomnias (5.7%) and suspicion of restless legs syndrome (0.8%). Snoring was documented in 85.2% of cases. Four children did not collaborate and in the remaining 118 exams performed with success the sleep efficiency was $84.8 \pm 11.2\%$. Thirty nine children (32%) presented an AHI ≥ 1 , confirming OSAS. The mean SpO₂ was 97%. The minimal SpO₂ was < 90% in 56% of children with OSAS, with the average time with a SpO₂ < 90% being 8.5 minutes. All OSAS patients presented snoring, neck hyperextension was documented in 28% of cases and diaphoresis in 18%. Also, 13% of children were previously diagnosed with ADHD. Regarding the severity, 67% had an AHI of 1-4.9, 20% of 5-9.9 and 13% ≥ 10 , corresponding to mild, moderate and severe OSAS, respectively, according many authors. Intermediate to severe nasal airflow limitation was documented in 17.8% of children not diagnosed with OSAS.

Conclusions: OSAS has deleterious consequences if left untreated. Early identification and treatment is desirable to prevent sequelae. Since almost all children with OSAS snore, asking about snoring is a sensitive screening measure. Studies have suggested that 25% of children with ADHD may actually have symptoms of OSA. Adenotonsillectomy is the first line treatment, with a success rate of 70-90%. If the child does not have adenotonsillar hypertrophy, the surgery is contraindicated or has failed, continuous positive airway pressure is the treatment of choice. Intranasal corticosteroids are an option for mild OSAS following surgery or if it is contraindicated.

Key words: *OSAS. Children. Polysomnography.*

CO 028. SLEEP BRUXISM ASSOCIATED WITH OBSTRUCTIVE SLEEP APNEA SYNDROME- A PILOT STUDY USING A NEW PORTABLE DEVICE

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Introduction: Sleep bruxism (SB) and obstructive sleep apnoea syndrome (OSAS) share common pathophysiologic pathways.

Objective: We aimed to study the presence and relationship of SB in a population of OSAS.

Methods: Patients referred with OSAS suspicion and concomitant SB complains were evaluated using a specific questionnaire, orofacial evaluation and cardio-respiratory polygraphy that could also monitor audio and EMG of the masseter muscles (Nox-T3, ResMed). This device has specialized software (Nox Medical's Noxturnal Software Version 3.1.1) that has been specifically configured to analyze both the SB index and respiratory events.

Results: From 11 patients studied 9 had OSAS. 55.6% were Male, Age was 46.3 ± 11.3 years, BMI 28.0 ± 4.4 , Epworth Sleepiness Scale 9.1 ± 5.5 , Apnea Hypopnea index of $11.1 \pm 5.7/h$. Through specific questionnaire 55.6% had SB criteria. Orofacial examination (only feasible in 3) confirmed tooth wear in all. 77.8% had polygraphic SB criteria (SB index > 2/h). Mean SB index was $5.12 \pm 3.6/h$, Phasic events predominated (72,7%) with an index of $3.7 \pm 3,0/h$. Concerning tooth grinding episodes, we found a mean of $10.7 \pm 9,2$ per night. All OSAS patients except two (77,8%) had more than two audible tooth-grinding episodes confirmed with audio analysis. These two patients were the ones with the lowest SB index (1,0 and 1,4 per hour). Only in one patient we could not detect tooth grinding episodes. There was a statistically significant positive correlation between tooth grinding episodes and SB index and phasic event index (R = 0.755, p = 0.019 and R = 0,737, p = 0.023 respectively, Pearson Correlation). All patients with mild polygraphic bruxism criteria did not have subjective bruxism criteria, but 80% of patients with severe polygraphic bruxism also had subjective bruxism criteria. Mean apnoea to bruxism index was 0.4/h, meaning that only a minority of SB events were not secondary to OSAS. We could not find any positive correlation between AHI and Bruxism index or Phasic Bruxism index (R = -0.632 and R = -0.611, p > 0.05, Pearson Correlation).

Conclusions: This pilot study shows that SB is a very common phenomenon in a group of mild OSAS, probably being secondary to it in the majority of cases. The new portable device used may add diagnostic accuracy and help to tailor therapy in this setting.

Key words: *Bruxism. Obstructive sleep apnoea syndrome. EMG. Masseter.*

CO 029. NEW GENERATION CARDIAC PACEMAKERS IN SLEEP APNEA DIAGNOSIS

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Introduction: Sleep apnea syndrome (SAS) is associated with increased cardiovascular morbidity and mortality. Some studies found that patients with cardiac pacemakers (PMs) have a high prevalence of SAS, but it is often undiagnosed. The gold standard for the diagnosis of SAS is an overnight laboratory-based polysomnography, which is expensive. Meanwhile, newly developed PMs are able to identify sleep respiratory events and therefore they may have a role in the SAS diagnosis.

Objective: To compare the respiratory disturbance index (RDI) evaluated by PMs (RDI-PM) with the RDI of gold-standard polysomnography (RDI-PSG).

Methods: Prospective study enrolling patients with clinical indication for PM(Reply 200). Demographic, anthropometric and clinical data were collected. All patients underwent PSG. We evaluated the correlation between RDI-PSG and RDI-PM obtained in the same night. The level of agreement (kappa) between PSG and PM regarding SAS diagnosis and severity was evaluated.

Results: 16 patients were included (69% men; mean age: 78 ± 5 years; BMI: 28 ± 4 Kg/m²). PSG diagnosed obstructive sleep apnea syndrome in 75% of patients (38% severe, 12% moderate, 25% mild). All patients with SAS had arterial hypertension, 75% had snoring, 42% witnessed sleep apnea, 17% restless sleep and 8% excessive daytime sleepiness (Epworth scale > 10/24). Mean RDI-PM was 49 ± 24 /h and mean RDI-PSG was 57 ± 22 /h. There was no significant correlation between RDI-PM and RDI-PSG ($r = 0.245$, $p = 0.361$). The level of agreement between PM and PSG in SAS diagnosis was fair ($k = 0.333$). In 19% of patients, PMs indicated an RDI compatible with SAS, which was not confirmed by PSG. Nevertheless, PMs detected all patients with SAS diagnosed by PSG. Regarding SAS severity, PM and PSG had also a fair level of agreement ($k = 0.227$). In 45% of cases, there was no agreement between methods with respect to disease severity.

Conclusions: We found a high prevalence of SAS (75%) in patients with PMs. Most were asymptomatic or had few symptoms, supporting a low level of SAS suspicion, which could delay the diagnosis. All patients with confirmed SAS were identified by PMs, thus they may be useful for screening of SAS in patients with PMs. However, at this moment, PMs could overdiagnose SAS, so the diagnosis should always be confirmed with PSG.

Key words: Sleep apnea. Pacemakers. Diagnosis.

CO 030. NEXT GENERATION SEQUENCING (NGS) OF CIRCULATING FREE DNA (CFDNA) IN LUNG CANCER PATIENTS

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Introduction: Lung cancer advanced stage therapy is based in molecularly driven options. There is an urgent need of a non-invasive, quick, affordable and accurate strategy that allows simultaneous detection of multiple molecular abnormalities. Tumour derived circulating free DNA (cfDNA) is originated mainly from apoptotic and necrotic tumour cells. The identification of genetic alterations expressed in cfDNA from plasma is an opportunity to understand the molecular landscape of lung cancer, representing a true liquid-biopsy. In this study, a strategy of profiling lung cancer patient's plasma cfDNA and tumour DNA (tDNA) is being evaluated with Ion Ampliseq Next Generation Sequencing method.

Methods: A design targeted panel of hotspots and regions of 22 genes implicated in lung and colon cancer used for Next Generation Sequencing (NGS) Ion Torrent technology was applied to cfDNA obtained from plasma samples collected at the diagnosis and during disease's evolution of patients with stage IIIB/IV adenocarcinoma. cfDNA genetic alterations were compared with tumour alterations (tDNA) determined by Ampliseq and standard mutation analysis. Main molecular alterations were considered and cfDNA changes along disease evolution were analysed.

Results: Twenty seven patients were included, 16 (59%), mean age 67,8 years, $sd = 12.1$. Six patients had an EGFR mutation detected

by Sanger sequencing and 5 ALK translocation by FISH. Nineteen patients with tumour genetic abnormalities (tDNA) detected by NGS were selected for cfDNA plasma analysis. Sixty samples were analysed (27 tumour and 33 plasma samples). Tumour derived genetic alterations could be identified in as little as 10ng of cfDNA with allelic frequencies as low as 0.1% and were equivalent to those of tDNA. Mutations identified in tDNA of the 19 patients were also present in cfDNA of 12 cases (63%). Among 5 patients with EGFR mutations detected on tDNA, 3 (60%) had the same alterations in cfDNA, no T790M mutation was detected. Four cases with plasma follow-up were analysed. One patient with ALK translocation had no cfDNA detected and has stable disease with chemotherapy, in one patient with exon 19 del, the mutation was detected only in the first plasma sample and is still on follow-up, two cases (1 EGFR and 1 ALK) levels of cfDNA increased with disease progression and before death.

Conclusions: Profiling cfDNA with Ion Torrent NGS technology is feasible, allowing the detection of a variety of molecular alterations, some associated with targeted therapy and other valuable for disease's monitoring. There was a good correlation between cfDNA alterations and molecular abnormalities found in the primary tumour, meaning that cfDNA can work as a "liquid biopsy". The application of NGS to tumour and plasma samples hold a large spectrum of potentialities and will change the future of lung cancer care.

Key words: Circulating free DNA. Next sequencing generation. Lung cancer. Mutations.

CO 031. IMMATURE MYELOID ANTIGEN PRESENTING CELLS IN LUNG ADENOCARCINOMA LYMPH NODES ASSESSED BY ENDOBRONCHIAL ULTRASOUND

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Introduction: In lung cancer, the immune cell compartment of tumor-draining lymph nodes (TDLN) undergoes profound modifications. The immunological response is predominantly dictated by antigen presenting cells (APCs) that capture antigens and migrate to the lymph nodes. If properly matured, APCs may prime anti-tumour specific T-cell populations. However, the role of APCs infiltrated in TDLN from lung cancer patients is poorly understood.

Objective: Study myeloid APCs (mAPC) in TDLN from lung adenocarcinoma patients and compare them with lymph nodes from patients with non-malignant diseases, using minimally invasive sampling methods.

Methods: Mediastinal lymph nodes were assessed by endobronchial ultrasound-transbronchial needle aspiration (EBUS-TBNA). Cell numbers, maturation and co-stimulatory profile were evaluated by flow cytometry and cytokine expression by quantitative polymerase chain reaction. The association with clinical parameters was assessed.

Results: TDLN from lung adenocarcinoma patients ($n = 24$) showed a reduced immune cell compartment and larger epithelial compartment when compared with control lymph nodes ($n = 17$). TDLN presented higher levels of infiltrating monocytic cells, including mAPCs. A decreased expression of co-stimulatory maturation molecules with lower levels of TNF- α and IL-12, and increased levels of immunosuppressive cytokines TGF- β and IL-10 was also observed. The IL-12 expression was inversely correlated with the percentage of tumor cells infiltrated in TDLN while IL-

10 was directly correlated. Patients with lower expression of IL-12 in TDLN and peripheral blood mAPCs with lower expression of CD80/86 had a worse overall survival.

Conclusions: mAPCs within adenocarcinoma TDLN are more immature compared to non-malignant lymph nodes. The cytokine profile suggests that they are biased toward a tolerance-inducing phenotype. EBUS-TBNA allows the collection of viable specimens that may provide a better insight of the immunological parameters within TDLN.

Key words: Antigen presenting cells. Lymph node. Non-small-cell lung cancer. Endobronchial ultrasound. Metastasis.

CO 032. RARE LUNG TUMORS: A REVIEW OF SIX YEARS OF EXPERIENCE OF AN INTERVENTIONAL PULMONOLOGY UNIT

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Introduction: Adenocarcinoma, squamous cell carcinoma, large cell carcinoma and small cell carcinoma account for 99% of primary lung tumors. Epidemiologically, a tumor is considered rare if its prevalence is less than 1%. These tumors can be malignant or benign and originated from multiple tissues (epithelial, mesenchymal, lymphoid, neurogenic or vascular).

Methods: Review of symptoms, radiological and endobronchial presentation of the rare lung tumors diagnosed at an interventional pulmonology unit from 2009 to 2014. Fifty-seven cases were identified. Diagnosis was made through videobronchoscopy or rigid bronchoscopy in 53 patients and through transthoracic needle aspiration in 4 patients.

Results: The malignant tumors identified were typical carcinoid (TC) (n = 18), atypical carcinoid (AC) (n = 10), Kaposi sarcoma (KS) (n = 5), synovial sarcoma (SS) (n = 5), diffuse large B cell lymphoma (DLBCL) (n = 4), bronchus-associated lymphoid tissue (BALT) lymphoma (n = 2), sarcomatoid carcinoma (SC) (n = 1), giant cell carcinoma (GCC) (n = 1), spindle cell carcinoma (SCC) (n = 1), Epithelioid haemangioendothelioma (EHE) (n = 1), nuclear protein of the testis (NUT) midline carcinoma (NMC) (n = 1) and cellular schwannoma (CSW) (n = 1). Hamartoma (n = 4), fibroma (n = 1), fibrolipoma (n = 1) and tracheal papilloma (TPP) (n = 1) were the benign tumors found. Cough was the most frequently reported symptom (n = 25). Dyspnea, recurrent respiratory infections and hemoptyses were more usual among patients with endobronchial tumor (11 vs 2; 7 vs 0; 6 vs 1). Data on radiology was available in 53 patients. Thoracic CT was normal in 2 patients, 28 presented with central lesions, 13 with peripheral lesions, 6 with endobronchial lesions and 4 with diffuse lesions. A solitary nodule was the most common manifestation of TC (n = 7) and hamartomas (n = 2). A mass was the most frequent in AC (n = 3), SS (n = 4), LDGCB (n = 3) and it was the presenting lesion of the cases of GCC, SCC, SC, EHE, NMC and CSW. One case of BALT lymphoma manifested as a solid nodule and the other as a consolidation. Most cases of KS (n = 3) presented centrilobular micronodules. Fifty-three patients underwent bronchoscopy. Thirty-three had endobronchial tumor, 12 had mucosal lesions and 8 exams were normal. An endobronchial tumor was present in 40-100% of the cases of TC, AC, KS, SS, BALT, SCC, hamartomas, fibroma, fibrolipoma and TPP. A smooth surface mass was the most frequent lesion of TC (n = 15, 78,9%), SS (n = 3, 75%), SCC, fibrolipoma and hamartomas (n = 2, 50%). The other cases of hamartoma and the TPP had polypoid lesions. Fibroma presented with a white, irregular mass, KS with red and purple lesions of the mucosa (n = 3, 60%) and BALT lymphoma with polypoid, friable lesions (n = 1, 50%). The cases of GCC, SC and MNC presented mucosal irregularities and one case of DLBCL showed bronchial narrowing due to external causes. The case of EHE had

a normal exam. In 41 (77,3%) patients, the diagnosis was obtained by bronchial biopsies and in 12 patients (22,6%) by transbronchial biopsies.

Conclusions: As it is described in the literature, the analysis of our unit experience confirms that, although not specific, some aspects of the clinical, radiological and endoscopic appearance can be suggestive of these unusual lung tumors.

Key words: Rare lung tumors. Radiological presentation. Endobronchial presentation.

CO 033. THE SURPLUS VALUE OF PROCALCITONIN IN THE INFECTED CANCER PATIENT APPROACH

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Introduction: Infections are frequent in lung cancer patients and contribute for their morbimortality so, the timely start of empirical antibiotherapy is extremely important. If C-reactive protein (CRP) is an important inflammation marker, the procalcitonin (PCT) is a useful biomarker for early diagnosis of bacterial or fungal infections. However, its role in cancer patients has raised doubts. The aim of this study was to evaluate the procalcitonin utility as a biomarker of bacterial infection in the lung cancer patient with increased inflammatory parameters, namely in the antibiotherapy use.

Methods: Retrospective study of a sample of selected patients from the HUC-CHUC Clinical Pathology Laboratory database that, during the year 2014, had serum procalcitonin assay. Only patients with histological diagnosis of primary lung cancer were included and were classified as infected if at least two of the following criteria were present: fever, purulent sputum, leucocytosis, pulmonary infiltrate, good response to antibiotherapy. Microbiological studies (sputum, blood and urine culture) were also taken into account. Many clinical and analytical parameters obtained from clinical charts were registered in a database and consequently processed by appropriate statistical methods and by using the software SPSS®, version 19.0 (SPSS, Inc., Chicago, IL). P-values < 0.05 were considered significant.

Results: 85 patients were included, who were distributed by main histological types (51.8% adenocarcinomas, 22.4% squamous-cell e 11.8% small-cell), 21.2% of which were infected. The median concentration of CRP for infected and non infected patients was 25.7 mg/dL [19.06-35.23] vs 11.7 mg/dL [7.11- 22.08] and that of PCT was 1.37 mg/dL [0.88-8.36] vs 0.19 mg/dL [0.11-0.37]. These values were significantly higher in infected patients (p < 0.001), but with no statistical difference between different histological types. Both CRP and PCT were significant predictors of infection, the PCT with a higher AUROC (0.965 vs 0.798, p < 0.001). We also calculated PCT sensitivity and specificity, 100% and 88.1% respectively, for a threshold of 0.54 mg/dL. In the sub-analysis of histological groups of non-infected patients we found that there was no significant difference in the value of the PCT in different groups, but CRP was significantly higher in small cell carcinomas relative to adenocarcinomas (p = 0.009) or squamous cell carcinomas (p = 0.014). Retrospectively analysing the therapeutic strategy in these patients we found a significant concordance, although weak, between infection and use of antibiotics (kappa = 0.154, p = 0.016). This was due to the existence of 65.7% non infected patients subject to antibiotherapy.

Conclusions: Although recent studies question the specificity of the PCT as a biomarker of bacterial infection in lung cancer patients, in our studied population we found a significant increase of its value in infected patients, stronger than CRP assay, showing high sensitivity and specificity values. Therefore we can assume its surplus value in the lung cancer patient approach with elevation of inflammatory

parameters, namely in antibiotherapy use, which may reduce its improper use in these population.

Key words: Lung cancer. PCT. CRP. Infection. Antibiotherapy.

CO 034. SURGERY IN THE TREATMENT OF LUNG CANCER IN THE ELDERLY: ANALYSIS OF THE EXPERIENCE OF ONE CENTER

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Introduction: Surgery has an essential role in the treatment of lung cancer. The aging of the population leads to an inevitable rise in the diagnosis of this disease in the elderly, eventually with a rise in the incidence of co-morbidities and surgical risk that might question the efficacy of the surgical procedure. It is our goal to present the experience of one center in patients over 70 years who were submitted to surgery for lung cancer with curative intent.

Methods: In this retrospective study we evaluated pre-operative co-morbidities, surgical procedure, post-operative complications and survival in patients over 70 years old. We included every patient submitted to lung resection surgery for primary lung cancer in the period between July 2012 and July 2015. The identification of irresectable disease during surgery was an exclusion criterion.

Results: In the study period, 55 patients were submitted to surgery, including 8 (14,5%) older than 80 years old, with approximately 20% females. 44 patients were submitted to anatomical lung resections with complete lymphadenectomy and 11 to minor resections. 42% of the patients were submitted to minimally invasive surgery. The average Charlson co-morbidity score was 4. Four patients had complications with need for surgical intervention. Mortality rate at 30 days was 0%, and at the end of an average follow-up period of 17,0 (\pm 10,4) months, 95% are alive.

Conclusions: Our results showed oncological results identical to the younger population, as well as acceptable morbimortality rates in this age group. These patients should be offered the best possible care available, including surgery, with a careful selection based on biological and functional criteria, and age should not be a contraindication by itself.

Key words: Thoracic surgery. Cancer. Lung. Elderly.

CO 035. PATIENTS WITH EARLY STAGE NON-SMALL CELL LUNG CANCER (NSCLC) - A 3 YEAR RETROSPECTIVE ANALYSIS

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Introduction: Lung cancer is one of the most frequent and constitutes the main oncology death cause worldwide. It's early stage detection is crucial for the patient prognosis. The surgical excision of the tumour is the best therapeutic option, being associated with a better survival and even to the cure. However, for the overwhelming majority of the patients, surgical treatment is not an option, due to the unresectability of the lesion, the existence of co-morbidities or the non compliance of the patient, being necessary to do other types of treatment.

Objective: Characterize a group of patients with early stage NSCLC and analyse its clinical evolution.

Methods: Out of a total of 423 patients, followed in Lung Oncology consultation at the Centro Hospitalar de São João (CHSJ) and newly

diagnosed with lung cancer over a period of 3 years (2012-2014), patients with NSCLC stage I, II and IIIa (in this stage only the one's being submitted to surgery) were selected.

Results: A total of 103 (24.3%) patients met the inclusion criteria. There was a male predominance (n = 75 (72.9%)) and a median age of 67.0 years. The great majority (n = 80 (78%)) presented a history of tobacco addiction and a good performance status (PS - 0 or 1 - n = 96 (96%)). The most frequent type of initial presentation was under the form of peripheral nodule (n = 71 (68.7%)) and on the upper lobes (RSL - n = 30 (29.3%) e LSL - n = 28 (27.3%)). The most common histological type was the adenocarcinoma (n = 71 (68.7%)), followed by the squamous cell carcinoma (n = 21 (20.2%)). The Ia (n = 44 (42.4%)) and Ib (n = 29 (28.3%)) stages were the most observed, with 8 patients on the IIIa stage. Regarding the first line of treatment, the surgical excision alone (n = 44 (42.4%)) or in combination with radiotherapy and/or chemotherapy (n = 36 (38.4%)) were the most common options. Until the end of study period (June 2015) a high percentage of patients remained free of disease (n = 69 (66.7%)) after the first line of therapy. The relapse was more frequently seen in patients with IIb stage (71.4% (n = 76)), with NSCLC non otherwise specified (66,7% (n = 69)), squamous cell carcinoma (40% (n = 41)) and with tumours localized on the middle lobe (37,5% (n = 39)). After a follow-up period of 42 months, 89 patients (85.9%) were still alive. The median survival was not possible to determine at this stage. In an attempt to correlate independent clinical or demographic factors and its influence on survival, statistically significant associations were achieved regarding the smoking history and the histological type (adenocarcinoma versus squamous cell carcinoma). Other associations regarding the location and the tumour dimension were not found.

Conclusions: Around one quarter of the patients, followed in the Lung Oncology consultation and diagnosed with lung cancer, have an early stage at diagnosis. In the majority of these patients, a surgical approach was possible with good results.

Key words: Lung cancer. Early stage.

CO 036. ENDOSCOPIC YIELD IN DIAGNOSIS OF LUNG CANCER

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Introduction: Lung cancer (LC) is the leading cause of all cancer associated deaths in Western countries. The diagnosis and staging are fundamental. Fiberoptic bronchoscopy (FB) is probably the most used technique for the diagnosis of LC. According to the unfavorable prognostic reality of LC, early diagnosis is thus an important ally in favor of increased survival of patients. The FB allows the visualization of the tracheobronchial tree and the collection of material for cytological and histological analysis. The diagnostic yield depends on the location and distribution of the tumor, the experience of the operator, the patient cooperation, the presence of hemoptysis, the number of biopsies, knowledge of the lesion by CT and processing/interpretation of the samples.

Objective: Description and analyze the diagnostic yield of FB held inpatients suspected to have a LC in Respiratory Endoscopy Sector of Egas Moniz Hospital from June 2014 to May 2015 (12 months).

Methods: Retrospective review of reports and analytic results of patients undergoing FB. The authors analyzed: demographics, provenance of patients, endoscopic findings, diagnostic yield, histological type, and complications.

Results: 146 FB were done; of which 110 (75.3%) were male patients. The average age was 70 (minimum age 33, maximum age 90). The majority of FB was requested by pulmonology. The most frequent endoscopic findings were: mucosal infiltration 37

(25.3%), endobronchial mass 30 (20.5%), reduction of bronchial diameter 25 (17.1%) and signals due to extrinsic compression 18 (12.3%). The diagnosis of cancer was made in 56 (38.4%) patients, from which 51 corresponds to LC and 6 correspond to metastasis of cancer from another location (stomach, colon, breast, blood). The histological types of LC were: 38 Non-small cell carcinoma - 27 adenocarcinoma, 11 squamous carcinoma and 10 small cell carcinoma - 9 small cell carcinoma and 1 neuroendocrine small cell carcinoma 1. The cytology of bronchial washings identified 23 NSCC (12 adenocarcinomas, 2 squamous carcinomas) and 3 SCC. Lung biopsy allowed the identification of: 34 NSCC (24 adenocarcinomas, 10 squamous carcinomas) and 9 SCC. Were performed 29 bronchial brushings, of which 9 have identified a cancer. Of the 30 patients with endobronchial mass FB confirmed the diagnosis in 20, reaching a diagnosis yield of 66.7%, and being the bronchial biopsy positive in 18 cases. Of the 50 patients in whom the FB was normal, we obtained a diagnosis in only 4 (8%). We only registered complications in 5 patients (3.4%): an episode of chest pain and tachycardia (interruption of the procedure), two episodes of bronchospasm, 1 hypertensive crisis and one episode of desaturation with hypertensive crisis.

Conclusions: FB is a fundamental test in the diagnosis of pulmonary masses suspected to be a pulmonary or extrapulmonary malignancy. The combination of cytology and histopathology increases the diagnostic yield of FB as a diagnostic method for LC. The existence of an endobronchial mass was the most important predictive factor for the histological diagnosis of LC.

Key words: Lung cancer. Fiberoptic bronchoscopy. Diagnostic yield.

CO 037. IS MALIGNANT PLEURAL MESOTHELIOMA IN SOUTHERN PORTUGAL INCREASING?

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Introduction: Malignant pleural mesothelioma (MPM) was a rare disease until the mid of last century. Its incidence is increasing especially in recent decades, accounting for about 1,500-2,000 deaths annually worldwide. Closely linked to asbestos exposure as in mining, manufacturing and dismantling of materials containing the mineral. The production and import of asbestos is forbidden since 2005 in the European Union. It's estimated, however, that the peak incidence of MM in Western Europe will occur in 2015-2020 due to the long latency period evidenced by this neoplasia. This work has as main objective to assess trends in the incidence of pleural mesothelioma in the south of Portugal in the last decade (2004-2013), simultaneously analyzing the changing demographic characteristics of the affected population, occupational exposure, smoking, time to diagnosis, diagnosis tests, histological subtype, initial staging, performance status (PS) and therapeutic held.

Methods: A retrospective cohort study enrolled patients with the diagnosis of MM identified by the Regional Cancer Registries (ROR) between 1 January 2004 and 31 December 2013. Initially 248 cases of mesothelioma were identified, 96 were excluded because they correspond to extra thoracic mesotheliomas, or their medical process was inaccessible ROR's data was completed through consultation of patient medical records in their hospital on

demographic, epidemiological and data relating to diagnosis and treatment. Data were analyzed with SPSSv21. It was possible to collect information on 152 cases of the possible 217 cases (70%) of patients with pleural mesothelioma.

Results: Analyzing the occurrence of MPM, 2013 was the year with the largest number of cases diagnosed n = 24, and the last recent biennial represents about 30% of observed cases, however, analyzing the cases frequency curve we cannot find a sustained increase over the analyzed decade. Over the last 10 years, there isn't a statistically significant difference in the evolution of the analyzed variables. On therapy's level there was an increase in the number of surgeries performed in the past 5 years (χ^2 (1, N = 152) = 4.537, p 0.033), however this have no impact in overall survival. It is therefore concluded that there isn't a sustained rise on the number of MPM cases over the last decade.

Conclusions: Although there is an increase in the recent 5 years of the number of surgeries with curative intent, there wasn't an improvement in overall survival of patients with MPM, leading to the hypothesis of surgeries with curative intent performed in patients who had a surgical post staging not compatible with this therapeutic option. It is clear the need to perform an accurate staging in these patients.

Key words: Pleural mesothelioma. Asbestos. Occupational exposure.

CO 038. THE ROLE OF RADIOTHERAPY IN CURATIVE TREATMENT OF LUNG CANCER - A 5-YEAR EXPERIENCE OF A ONCOLOGIC PULMONOLOGY UNIT

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Introduction: The radiotherapy plays a central role in the management of lung cancer patients, and is the only non-surgical treatment with curative capacity. It can be used in patients with non-small cell lung cancer in early stages with refuse or without surgical conditions, as adjuvant or neoadjuvant of the surgery or in combination with chemotherapy in locally advanced tumors.

Objective: Evaluation of lung cancer patients submitted to radiotherapy with curative intent.

Methods: Retrospective study of patients with lung cancer followed in an Oncologic Pulmonology Unit that performed curative radiotherapy between January/2010 and December/2014. Demographic data were collected, performance status (PS) by Zubrod Scale (Eastern Cooperative Oncology Group), characteristics of oncological disease, indications for radiotherapy, dosimetric scheme, complications and outcome.

Results: Were analyzed 106 episodes of curative radiotherapy, corresponding to 50% of total radiotherapy episodes in lung cancer patients (curative, palliative and prophylactic brain irradiation). Of the 106 patients 80.2% were men, mean age 67.3 ± 10.8 years and 78.1% smokers/ex-smokers. In 89.6% of cases radiotherapy treatment was performed strictly on an outpatient. The main histological types treated were squamous cell carcinoma (42.5%), adenocarcinoma (31.1%) and small cell lung cancer (19.8%). The distribution of patients by stage was IA (9.4%), IB (10.4%), IIA (11.3%), IIB (0.9%), IIIA (28.3%) and IIIB (39.6%). The PS was < 2 in 93.4% of cases. The radiotherapy was used in combination with chemotherapy in 74.5% of cases (concurrent 59.5% and sequential 40.5%), isolated in 17.9% (for refusal or absence of surgical conditions) and in 7.5% after surgery. The mean time from the radiotherapy indication until its onset was 20.3 ± 9.1 days. It used the "conventional" method in 98.6% of cases and 1.4% have received stereotactic radiotherapy. The total average dose

performed was 56.2 ± 9 Gy, with complete treatment in 91.5% of cases. There were extra-pulmonary complications in 67% of patients, the most frequent oesophagitis (27.4%) dermatitis (22.6%) and haematological toxicity (8.5%) and pulmonary- RILD (radiation-induced lung disease) in 30.2%. The development of RILD had no statistically significant association with age, smoking history or delivered dose. The median overall survival was 14 months and overall survival at 1 and 3 years was 65% and 16% respectively. There was cancer progression in 71.1% of cases, 19.6% were stable disease and 9.3% there were no evidence of disease activity. In the group of chemo-radiotherapy, in respect to complications and survival, there were no statistically significant differences between those who made concurrent or sequential treatment.

Conclusions: In this sample, the radiotherapy has several applications in the curative treatment of lung cancer, alone and in combination with other therapies. The delay time for the treatment start was within the acceptable according to the standards of good practice. The concomitant chemo-radiotherapy compared to sequential treatment showed no statistically significant differences with respect to complications and outcome. Complications were varied, not having found risk factors for the development of RILD.

Key words: Lung cancer. Curative radiotherapy. Complications. Survival.

CO 039. PULMONARY LYMPHANGIOLEIOMYOMATOSIS: UN PROBABLE DIAGNOSIS ON ELDERLY WOMEN

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Introduction: The lymphangioleiomyomatosis (LAM) is a rare pulmonary disease. It can occur sporadically or in genetic association with Tuberous Sclerosis. It occurs predominantly on adult, pre-menopause women and rarely on men or children. Although rare, it can also occur in post-menopause women, typically in association with hormone replacement therapy or oophorectomy. The authors present three clinical cases of LAM on elderly patients.

Case reports: Case 1: eighty-six years old woman, Caucasian, non-smoker, with medical history of cardiac failure and hypothyroidism was admitted to the Respiratory Department with dyspnoea and type 2 respiratory failure. The chest X-ray showed a right basal hypertransparent area. We performed a chest computerized tomography (CT) that proved a right pneumothorax with a left mediastinal sliding. We conducted the chest drainage with resolution of pneumothorax. Follow-up chest CT shows multiple dispersed pulmonary cysts. Case 2: Eighty-eight years old woman, Caucasian, non-smoker, with medical history of cardiac failure and diabetes mellitus was admitted to the Respiratory Department with dyspnoea and type 2 respiratory failure. We conducted complementary studies, and the chest CT that showed multiple dispersed pulmonary cysts. Case 3: Seventy-two years old woman, Caucasian, non-smoker, with medical history of hypertension and dyslipidemia. She is monitored due to long-standing tiredness and weight loss. We conducted complementary studies, and the chest CT that showed multiple dispersed pulmonary cysts. Although the chest CTs from the three patients suggested a diagnosis of LAM, we have not carried out pulmonary biopsies due to the high surgical risk. Radiology physicians reviewed the CT images and, supported by international guidelines, determined that the LAM diagnosis was probable. Pulmonary cysts and respiratory failure stayed stable during the two years of follow up, suggesting clinical stability.

Discussion: LAM is a rare diagnosis on elderly patients. Its pathophysiology on this age group is unclear, and it seems unknown mechanisms. Although rare, this diagnosis should be considered on post menopause women with pulmonary cystic disease.

Key words: Lymphangioleiomyomatosis. Pneumothorax. Elderly woman.

CO 040. USUAL INTERSTITIAL PNEUMONIA IS NOT SYNONYMOUS WITH IDIOPATHIC PULMONARY FIBROSIS - REPORT OF FOUR CASES

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Introduction: The radiological pattern of usual interstitial pneumonia (UIP) is characterized by reticular opacities in the immediate subpleural lung, often associated with honeycombing and/or traction bronchiectasis with peripheral and lower lobe predominance. Although it is typically seen in idiopathic pulmonary fibrosis (IPF), it may also be present in diseases with a quite different natural history, namely connective tissue diseases. The authors describe and discuss four cases of autoimmune diseases, which have this radiological pattern, underlining the fact that, contrary to what occurs in IPF, this factor alone does not contribute to a poorer prognosis, mainly due to better response to immunosuppressive therapy.

Case reports: Case 1: A 69 year-old male, ex-smoker, diagnosed with rheumatoid arthritis two and a half years previously. He presented with dyspnea on effort and dry cough for two years and five months. High resolution chest CT (HRCT) revealed IPU. Lung function testing showed moderate restrictive syndrome and the six-minute walk test a desaturation of 94 to 88% (minimum 87%), with a distance of 376m (78% predicted). The patient is under salazopyrin, prednisolone and leflunomide, and previously was on methotrexate. He maintains clinical, functional and radiological stability, in a 2 year follow-up. Case 2: A 44 year-old female, non-smoker, diagnosed with systemic sclerosis since 39 years. She complained of moderate effort dyspnea and dry cough. HRCT showed UIP pattern and respiratory function moderate restrictive syndrome. Treatment with prednisolone, cyclophosphamide and imatinib allowed resolution of complaints and improvement of lung function. Radiologically, she remained stable during a 5 year of follow-up. Case 3: A 26 year-old woman, non-smoker, diagnosed with systemic lupus erythematosus since the age of 16. She developed dyspnea of moderate effort associated with UIP pattern on HRCT and thus the dose of corticosteroids and azathioprine was increased. She was kept under surveillance, presenting radiological stability with clinical and pulmonary function improvement. During follow-up she developed a "shrinking lung syndrome" that worsened pulmonary function, without radiological repercussions. An improvement was observed with bronchodilators and the immunosuppressive therapy with corticosteroids and mycophenolate mofetil, for a total follow-up of 6 years. Case 4: A 59 year-old female, non-smoker, with polymyositis since the age of 49. A HRCT was carried out due to dyspnea, dry cough and asthenia to moderate effort, and the radiological pattern was also UIP. Functional testing was associated with slight obstructive syndrome. Later she was put on methotrexate and azathioprine with resolution of complaints and respiratory function. Radiologically, she remained stable after 1 year.

Discussion: IPU pattern can be observed in different autoimmune diseases, in which the anti-inflammatory/immunosuppressive therapy appears to be effective. These findings suggest significant differences in the pathophysiology of idiopathic versus secondary pulmonary fibrosis. These case series aim to call attention to the importance of the exclusion of autoimmune diseases in patients with this radiological pattern and corroborate the difference in prognosis compared to IPF.

Key words: Usual interstitial pneumonia. Connective tissue disease. Idiopathic pulmonary fibrosis. Corticosteroids. Immunosuppressive therapy.

CO 041. NON-SPECIFIC INTERSTITIAL PNEUMONIA - CLINICAL ASSOCIATIONS AND EVOLUTION

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Introduction: Idiopathic interstitial pneumonias comprise a heterogeneous group of diseases, in which non-specific interstitial pneumonia (NSIP) is the second most common. This pattern is often associated with connective tissue disease (CTD), drug toxicity, hypersensitivity pneumonitis (HP), and in some cases is considered idiopathic. Although natural history of NSIP is not yet fully established and its evolution depends on the underlying etiology, NSIP is normally associated with a good prognosis.

Aims: Identification, clinical and functional characterization, as well as determination of evolution of patients with NSIP.

Materials and methods: Evaluation of patients followed at an interstitial lung disease outpatient clinic with the diagnosis of NSIP (according to ERS/ATS diagnostic criteria). A retrospective analysis of patients was performed, encompassing etiology, clinical, functional and imagiologic evaluation, in addition to evolution. SPSS was used for statistical analysis, $p < 0.05$ considered statistically significant.

Results: We included 57 patients, with a mean (\pm SD) age of 60 (\pm 12) years and 78.9% ($n = 45$) female. Regarding smoking, the majority (54.4%, $n = 31$) was non-smoking, 14% ($n = 8$) former smokers and 8.8% ($n = 5$) current smokers. Possible etiologies for the pattern of NSIP were related in most patients (61.4%, $n = 35$) with CTD and in the remaining (38.6%, $n = 22$) with drug toxicity ($n = 10$), chronic HP ($n = 10$) and considered idiopathic in 2 cases. Regarding patients with CTD, 13 had systemic sclerosis (SSc), 10 rheumatoid arthritis (RA), 4 dermatomyositis/polymyositis, 3 Sjögren's syndrome, 3 mixed connective tissue disease and 2 systemic lupus erythematosus. Drugs associated with NSIP in this patient group were statins ($n = 7$) and metformin ($n = 3$). At baseline functional assessment, there was a restrictive pattern in 23.1% ($n = 12$) and obstruction in 5.8% ($n = 3$) with a mean (\pm SD) of 97 (\pm 22.6)% for FVC, 97.3 (\pm 20.1)% for FEV₁ and 93.2 (\pm 18.4)% for TLC. The majority of patients (80.4%, $n = 41$) had decreased D_LCO (65.3 (\pm 20.2)%). Echocardiographic parameters compatible with pulmonary hypertension were present in 45% ($n = 18$). With regard to CTD, the pulmonary involvement preceded the remaining manifestations in 2 cases; in the rest, median time to diagnosis of pulmonary involvement was 4 years (maximum 28 years). Comparing between groups of CTD, there were lower values of FVC, FEV₁ and D_LCO in SSc, with significant differences only for FVC ($p = 0.016$ vs. RA and $p = 0.029$ vs. other CTD). In 47.4% ($n = 27$) of NSIP cases, immunosuppressive therapy was introduced. By Kaplan-Meier curve, the median survival of this sample of patients has not been reached yet. Only 5 patients (10.2%) died during the follow-up, and in two cases the cause of death was not related to NSIP.

Conclusions: In this series of cases NSIP was more frequent in CTD, followed by drug toxicity, and the idiopathic cases were very rare. In most cases, the major functional impairing was reflected in a decrease in D_LCO, being also considerable the proportion of patients with echocardiographic parameters compatible with pulmonary hypertension.

Key words: Non-specific interstitial pneumonia. Etiology. Evolution.

CO 042. TELOMERE LENGTH AND ITS CLINICAL IMPACT ON IDIOPATHIC PULMONARY FIBROSIS

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Introduction: Idiopathic pulmonary fibrosis (IPF) is a progressive fibrotic disease of unknown aetiology with a variable clinical course. Several biochemical and genetic markers have been studied for its role in prognosis of these patients. One of the most promising is the telomere length in the context of mutations in the telomerase enzyme. The telomeres shortening (TS) has been linked to a higher risk of developing the disease and with a worst outcome.

Objective: Analyse the telomere length in patients with IPF and its impact in terms of survival.

Methods: Patients with IPF were selected on a random basis from the Diffuse pulmonary disease outpatient clinic in the Centro Hospitalar São João. DNA samples from peripheral blood were gathered and the relative telomere length was measured by a quantitative *polymerase chain reaction* (qPCR) with SYBR[®] Green. The relative length is expressed by the ratio between the number of copies of the telomeres repeat (T) and single copy gene (S) on the samples, relatively to a reference sample (T/S ratio). Several clinical parameters were also analysed at the time of the diagnosis.

Results: A total number of 33 patients were selected, with an average age of 69.1 \pm 10.2 years and a male gender predominance (81.8%). Most of the patients presented a history of tobacco consumption (70%). In terms of blood gas values a median paO₂ of 76.1 mmHg (CI95%: 68.1-76.7mmHg) and paCO₂ of 39 mmHg (CI95%: 37.7-41.0 mmHg) were observed. The median pulmonary function parameters were the following (FVC%: 76.1% CI95%: 67.4-80.1%); (FEV₁: 83.3% CI95%: 74.7-88.5%); (DLCO: 32% CI95%: 36.9-51.5%). The average telomere length was 0.82 (CI95%: 0.82-1.4) and a telomere shortening (T/S ratio < 1) was observed in the majority of the patients (63.6%). The mortality rate was of 75.8% with a median survival of 36 months (CI95%: 20.7-51.3). The telomere shortening did not show a statistically significant impact ($p = 0.15$) on the survival of these patients.

Conclusions: This study confirms the presence of a telomere shortening in a significant number of IPF patients. Nevertheless, no clear impact in terms of survival was noticed.

Key words: Pulmonary fibrosis. Telomeres.

CO 043. NATURAL KILLER AND NATURAL KILLER T-LIKE CELLS IN BRONCHOALVEOLAR LAVAGE FLUID AND PERIPHERAL BLOOD IN DIFFERENT TYPES OF INTERSTITIAL LUNG DISEASES

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Introduction: Natural Killer (NK) cells have a cytotoxic function and capacity to secrete pro- and anti-inflammatory cytokines. Natural Killer T like (NKT) cells express features of both NK and T cells and, with their immunoregulatory functions, may be involved in the modulation of bronchoalveolar inflammation in interstitial lung diseases (ILD). Bronchoalveolar lavage fluid (BALF) lymphocyte subpopulations analysis can be a useful supplement in ILD diagnostic approach.

Objective: Analysis of frequency and distribution of NK and NKT like cells in BALF and peripheral blood (PB) of patients with different types of ILD and a lymphocytic alveolitis.

Methods: We included 202 patients followed at an ILD outpatient clinic. BALF was carried out within the diagnostic work-up of a suspected ILD and processed following recommendations of ERS Task Group. In BALF and PB samples, lymphocyte subpopulations were studied by flow cytometry. NK cells (CD3-CD16/56+) and NKT like cells (CD3+CD16/56+) were scored in percentages of lymphocytes. Non-parametric statistics was used with a p -value < 0.05 considered statistically significant.

Results: Patients included had a mean(SD) age of 46.8(15.8) years, 41.6% were male and were classified in 5 groups, based on clinical, radiology, functional and BALF data: 106 with sarcoidosis, 53 with hypersensitivity pneumonitis (HP), 25 with pulmonary involvement by connective tissue disease (CTD), 8 with idiopathic pulmonary fibrosis (IPF) and 10 with organizing pneumonia (OP). BALF subpopulations analysis was characterized by lymphocytosis, with a median (P25-75) of 41.8% (28.0-57.4), HP having significantly higher values, 53.2%(41.0-69.1), than all other groups ($p = 0.034$ for OP and $p < 0.001$ for other ILD). All groups, except sarcoidosis, had a mixed alveolitis. CD4/CD8 ratio was significantly elevated in sarcoidosis ($p < 0.05$), with a median (P25-75) of 4.3 (2.4-7.1). The relative number (%) of NK cells were significantly lower in BALF than PB in all groups ($p < 0.05$). Regarding %NKT like cells, although with higher values in the BALF no significant differences were found. In patients with HP there were higher BALF %NK cells (vs sarcoidosis and other ILD[IPF/OP/CTD], $p < 0.001$) and %NKT like cells (vs sarcoidosis, $p = 0.027$). There were no differences within groups regarding BALF NKT/NK ratio, which had a median (P25-75) of 2.3 (1.0-4.3). In the PB compartment no differences within groups were found regarding %NK cells, but %NKT like cells were higher in sarcoidosis patients (vs IPF and CTD pulmonary involvement, $p = 0.01$; vs HP, $p = 0.24$). Also in sarcoidosis, a negative correlation was found between BALF CD4/CD8 ratio and NKT/NK ratio ($r = -0.209$, $p = 0.04$).

Conclusions: Higher BALF relative numbers of NK and NKT like cells were found in hypersensitivity pneumonitis cases, results consistent with previous studies. In sarcoidosis, higher relative numbers of circulatory NKT like cells were found, comparatively to other ILD, but the same didn't occur in BALF. This finding, together with the BALF negative correlation of CD4/CD8 and NKT/NK ratios, leads us to hypothesise that a relative depletion of NKT like cells could promote, through the lack of an immunoregulatory effect, the characteristic local CD4+T cell proliferation of sarcoidosis. The functional implications of these findings needs further research, to better define the role of NKT like cells in ILD pathogenesis.

Key words: Natural Killer cells. Natural Killer T-like cells. Bronchoalveolar lavage fluid. Peripheral blood. Interstitial lung diseases.

CO 044. IDIOPATHIC PULMONARY FIBROSIS - EXPERIENCE OF A DEPARTMENT OF PULMONOLOGY

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Introduction: Idiopathic pulmonary fibrosis (IPF) is defined as a specific form of chronic, progressive fibrosing interstitial pneumonia of unknown cause, occurring primarily in older adults, and limited to the lungs. It is characterized by progressive worsening of dyspnea and lung function and is associated with a poor prognosis.

Objective: Evaluate patients with IPF actually or previously followed in the Pulmonology Department of CHVNG/E, relative to demographics, treatment and survival.

Average age at diagnosis	68 ± 11 years; min. 35 years, máx. 93 years
Gender	73% male (n = 36), 29% female (n = 14)
Smoking habits:	
Smoking	20% (n = 10)
Ex-smoker	37% (n = 18)
Non-Smoking	43% (n = 21)
Major comorbidities:	
RGE	24% (n = 12)
Gastritis	4% (n = 2)
Hiatus hernia	2% (n = 1)
Diabetes mellitus	14% (n = 7)
Cardiovascular disease	8% (n = 4)
Concomitant diagnosis of lung cancer	4% (n = 2)
Main form of diagnosis:	
Bronchoalveolar lavage + Chest CT	35% (n = 17)
Surgical lung biopsy	20% (n = 10)
Chest CT	39% (n = 19)
Cases discussed in a multidisciplinary meeting	100% (n = 49)
Prognostic indicators in the initial approach:	
GAP	Median 2
CPI	Average 42.3 ± 15.2
DuBois	Average 23 ± 13
Functional study:	
Desaturation in the march of proof	57% (n = 28)
Average value of FVC	79% ± 21
Average value of TLC	80% ± 16
Average value of DLCO	51% ± 20
Average value of pO ₂	73 ± 14 mmHg
Oxygen Therapy	51% (n = 25)
Pulmonary hypertension	33% (n = 16)
Treatment in the course of the disease:	
Corticosteroids	39% (n = 19)
Azathioprine	18% (n = 9)
Mycophenolate mofetil	8% (n = 4)
Acetylcysteine	22% (n = 11)
Pirfenidone	16% (n = 8)
Nintedanib	6% (n = 3)
Referral for transplantation	37% (n = 18)
Median survival	22 months
Mortality	55% (n = 27)

Methods: Retrospective analysis of patients with IPF followed in consultation in the Department of Pulmonology CHVNG/E since January 1, 2011 until July 31, 2015. We analyzed demographic variables, comorbidities, diagnostic method, functional characteristics, treatment and prognosis indexes. From a total of 60 patients, 11 were excluded due to incomplete data.

Results: Forty-nine patients were included. The data for these patients were (table). Of patients receiving pirfenidone 2 suspended for pulmonary toxicity, 2 died, 2 maintain therapeutic and 4 are awaiting approval by Infarmed. Three patients maintain therapy with nintedanib and 2 recently obtained approval by Infarmed.

Conclusions: According to the indices evaluated the prognosis is poor in most patients, with a short survival time. Most patients present functional changes at diagnosis. The progression of the disease and the high mortality rate highlight the importance of early diagnosis and treatment.

Key words: *IPF. Diagnosis. Treatment.*

CO 045. PIRFENIDONE IN THE TREATMENT OF IDIOPATHIC PULMONARY FIBROSIS - THE REAL LIFE SETTING

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Introduction: Idiopathic pulmonary fibrosis (IPF) is a chronic, progressive and fatal fibrotic lung disease. Although periods of transient clinical stability may be observed, the pace and magnitude of disease progression is often unpredictable. Pirfenidone is an orally administered drug with anti-fibrotic and anti-inflammatory properties. It reduces the decline in forced vital capacity (FVC) in IPF patients, which led to its approval in the treatment of mild-to-moderate disease (FVC between 50% and 80% predicted). Administration of pirfenidone is considered safe and generally well tolerated and the most common side effects are gastrointestinal and skin events.

Objective: Characterize the IPF patients treated with pirfenidone in our institution: side effects, management and patients evolution.

Methods: Historical prospective study of IPF patients treated with pirfenidone followed in our ILD outpatient clinic was conducted. Data collected: demographics, lung function tests, side effects and mortality.

Results: Nine patients were candidates for this treatment but only 8 started pirfenidone and included in this study. Four patients were women, and the mean age of the patients was 67.62 (\pm 5.33) years (max: 75; min: 61). Mean% predicted FVC of 69.81% (\pm 8.34) and mean predicted DLCO% of 33.85 (\pm 14.13). The mean six-minutes walk distance was 378 (\pm 124) meters and 6 out of 7 patients (85.7%) presented desaturation. Six patients (75%) had echocardiographic findings suggestive of pulmonary hypertension. Main side effects were weight loss (6), abdominal pain (5), anorexia (4), vomiting (4), nausea (1) and bronchospasm (1). Two patients had pulmonary embolism and 62.5% of the patients (n = 5) experience an acute exacerbation while on pirfenidone. The median time since the start of the drug and the first exacerbation was 3.96 months (max: 7.56; min: 0.96). Out of 8 patients 2 died while on pirfenidone due to acute exacerbation and other in the sequence of pulmonary embolism. Three patients interrupted treatment due to intolerable side effects (one for intense phototoxicity and the others for lung toxicity). From the 2 patients who develop lung toxicity, one had bronchospasm, clinical and functional worsening and the other experienced acute exacerbation in probable relation to pirfenidone treatment. Both patients stopped pirfenidone and experienced clinical and functional improvement. All patients who interrupted pirfenidone presented grade 2 adverse events. The median time of treatment was 5.7 months (max: 12.1; min: 2.90).

Conclusions: The multifaceted clinical course of IPF can present a number of challenges to the clinician in the real-life setting, particularity in the choice of a safe and appropriate treatment. The main side effects reported in this study were gastrointestinal related. Despite the literature available, in our small group of patients more adverse events were reported than those describe. Some were potentially life-threatening (2 patients with lung toxicity) and some intolerable for the patients (photosensitivity reaction), which lead to drug discontinuation. Pirfenidone is a generally well tolerated drug, but important adverse events can occur and long-term safety is still being evaluated. It was not

possible to evaluate the functional evolution of these patients due to the short time on pirfenidone.

Key words: *Pirfenidone. Idiopathic Pulmonary fibrosis.*

CO 046. PULMONARY HYPERTENSION IN A PATIENT WITH NEUROFIBROMATOSIS TYPE 1 AND INTERSTITIAL LUNG FINDINGS

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Introduction: Neurofibromatosis type 1 (NF1) is a disease of autosomal dominant inheritance. Pulmonary hypertension (PH) is a rare complication that occurs by a multifactorial/unknown mechanism. The authors present a pre-capillary PH case in a non-smoking female with NF1 who had an interstitial lung pattern with centrilobular ground-glass micronodules. Interstitial findings are discussed in the context of NF.

Case report: A 68-year-old female presented with progressive exertional dyspnea since a year ago. She had worked in denim industry. There was no smoke history. Physical examination showed scattered cafe au lait spots and cutaneous neurofibromas. Arterial blood gas analysis demonstrated a $paO_2 = 55$ mmHg and HRCT patchy areas of centrilobular ground-glass micronodules. The further investigation included: respiratory functional tests - reduced diffusing capacity for carbon monoxide (DLCO = 2.15 mmol/min/kPa, 43.5%); 6MWT - significant desaturation; echocardiogram - PSAP 32 mmHg, preserved global systolic function; thoracic CT angiography - no signs of pulmonary embolism; autoimmune study - normal; HIV serology- negative; BAL cytology - increased monocytes/macrophages (97%). A transthoracic biopsy was also performed but it didn't allow a definitive diagnosis. Concomitantly, the presence of cafe au lait spots, cutaneous neurofibromas, Lisch nodules and a sacroiliac schwannoma allowed NF diagnose, which was confirmed by genetic study (type 1). In the meantime, there was a progressive worsening with cor pulmonale signs. Right heart catheterization with vasodilation test was performed and confirmed pre-capillary PH (mPAP = 41 mmHg; PECP = 9 mmHg; RVP = 13.4 UWood; CI = 2,39 L/min/m²) which could fit in group 5, secondary to NF. At this time there was doubt about the presence of interstitial lung disease, so surgical lung biopsy was requested. The material obtained was reviewed by a pathologist of the Royal Brompton Hospital. There was marked thickening of the intima of arteries and some arterioles secondary to vascular disease. It was also visible accumulation of macrophage along bronchovascular bundles but also at alveolar spaces and hyperplasia of type II pneumocytes. With regard to interstitial findings, it was placed the hypothesis of RB-ILD. However, the patient had no smoke exposure history. There were also reports of the presence of interstitial abnormalities in the context of NF1. The patient was referred to a PH treatment center. She began iloprost in January 2014; Bosentan and sildenafil were added a month later; Iloprost was changed to epoprostenol IV 6 months later. There was no response to triple therapy and the patient experimented progressive deterioration culminating in death 18 months after treatment beginning.

Conclusions: PH in the NF context usually courses with a poor prognosis and specific therapy has a limited impact. The occurrence of interstitial findings associated with NF has been suggested in some series that report the presence of pulmonary cysts and centrilobular micronodules of ground-glass density, even in non-smoking patients. In most cases, investigation with lung biopsy is missing.

Key words: *Pulmonary. Hypertension. Neurofibromatosis. Interstitium. Vasculopathy.*

CO 047. THE ROLE OF ENDOBRONCHIAL ULTRASOUND-GUIDED TRANSBRONCHIAL NEEDLE ASPIRATION IN THE DIAGNOSIS OF GRANULOMATOUS LYMPHADENITIS

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Introduction: Endobronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUS-TBNA) is an important technique in the investigation of mediastinal lymphadenopathies. Recently, several studies have been published about its importance in the diagnosis of granulomatous diseases, particularly sarcoidosis. The aim of this study is to describe our experience in the diagnosis of granulomatous lymphadenitis by this technique.

Methods: Of the EBUS-TBNA performed between June 2012 and February 2015 at Hospital Beatriz Ângelo, we selected those with a cytology revealing granulomatous lymphadenitis. We analyzed diagnostic techniques and their complications, other invasive diagnostic tests performed, cytological and/or histological diagnosis and, in the case of sarcoidosis patients, demographic characteristics and radiological stages.

Results: During this period, there were 21 EBUS-TBNA with a diagnosis of granulomatous lymphadenitis, 9.6% of all EBUS-TBNA done. An average 1.95 stations were punctured and the most frequent was 7 (86% of patients) followed by 4R (48% of patients). The average size of the punctured stations was 17.2 ± 6.4 mm. Bronchial and/or distal biopsies were obtained in 5 patients (3 inconclusive and 2 diagnostic) and bronchoalveolar lavage in 12. There were no complications. Two (9.5%) patients had previous nondiagnostic biopsies from flexible bronchoscopy and 4 (19%) subsequently underwent mediastinoscopy. In 21 patients, conclusive results were obtained in 14. Sarcoidosis was diagnosed in 13 and cancer associated sarcoid-type reaction was diagnosed in the other. Of the 4 patients undergoing mediastinoscopy, 2 were diagnosed with sarcoidosis, 1 with cancer associated sarcoid-type reaction and 1 with tuberculosis. 1 patient remained without a diagnosis and the other 2 had insufficient clinical data because they attended our hospital only to perform EBUS-TBNA. Sarcoidosis patients (15) had a mean age of 54.9 ± 13.8 years, 53% were female and 87% were Caucasian. Concerning radiological stages, 53% had stage II and 47% had stage I disease.

Conclusions: EBUS-TBNA is a valuable test in mediastinal lymphadenopathies investigation and has a low complication rate. The small number of patients with previous invasive tests indicates that EBUS-TBNA is already our first option in the approach to the patient with this entity.

Key words: Endobronchial Ultrasound-guided transbronchial needle aspiration. Granulomatous lymphadenitis.

CO 048. VIDEOTHORASCOPIC LUNG BIOPSY ON PATIENT WITH INTERSTITIAL LUNG DISEASE: TEN YEARS DESCRIPTIVE STUDY

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Introduction: Interstitial lung diseases are complex and usually have limited therapeutic offer. The lung biopsy has an important role on diagnosis. Among the patients who have a suspected interstitial lung disease, the classic surgical biopsy has high morbidity. Videothoracoscopy (VATS) is a minimal invasive technique with good accuracy.

Objective: The main objective of the study was to determine the accuracy of videothoroscopic lung biopsies. The secondary objective was to characterize the patients submitted to this technique.

Methods and results: We reviewed the process of all patients who were submitted to VATS during 10 years (2005-2014). The lung biopsies were made with auto-suture (EndoGIA) or electrocautery. Fifty-seven patients had videothoracoscopy lung biopsy. The clinical suspicion was supported by symptoms, environmental or professional exposure, abnormal findings on high-resolution chest tomography and abnormal findings on plethysmography. The average age was 55 years. The majority of patients were female (54.4%) and Caucasian (91.2%). About habits, 73.7% of patients had smoke history. The average value of Tiffeneau index was 82.4% ($\sigma = 13.4$); 70.5% ($\sigma = 23.51$) of FVC; 68.4% ($\sigma = 24.0$) of FEV₁ and 85.6% ($\sigma = 22.9$) of TLC. We conducted 37 (65%) lung biopsies with auto-suture, 18 (31.5%) lung biopsies with electrocautery and in just one patient we proceeded only to pleural biopsy. The diagnosis was inconclusive in 10 patients because of the presence of high level of fibrosis on microscopic evaluation. Twenty-one percent of diagnosis was unusual interstitial pneumonia (UIP), 12.3% Extrinsic Allergic Alveolitis, and 8.7% desquamative interstitial pneumonia (DIP).

Conclusions: The accuracy of videothoroscopic lung biopsies is close to 100%. The level of inconclusive diagnosis (17.5%) can be related to long evolution of the disease at the time of diagnosis. Videothoracoscopy still have an important role in the diagnostic of patients with high level of suspicion of interstitial lung disease.

Key words: Videothoracoscopy. Lung biopsy. Interstitial lung disease.

CO 049. PATIENT SATISFACTION DURING ENDOBRONCHIAL ULTRASOUND PERFORMED UNDER SEDATION OR GENERAL ANAESTHESIA - A RANDOMIZED TRIAL

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Introduction: Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive technique that usually requires some kind of sedation but the best anaesthetic procedure is still matter of controversy. Besides EBUS-TBNA accuracy, a major concern is given to preserve patient's comfort and safety.

Objective: To evaluate patient's comfort and satisfaction during EBUS-TBNA performed under intravenous general anaesthesia (Group 1) or intravenous sedation (Group 2).

Methods: A prospective, randomized and multicentric study was performed using two different methods of anaesthesia for EBUS-TBNA. Group 1 was submitted to general anaesthesia with neuromuscular blockage and ventilation with introduction of the EBUS through a rigid bronchoscope, laryngeal mask or orotracheal tube. For Group 2, patients were submitted to intravenous sedation with spontaneous breathing and a mouthpiece was used. Anaesthetic procedures were done by anesthesiologists. Patient's demographics, anxiety, comfort, tolerance, preferences and safety were compared. The Hospital Anxiety and Depression Scale (HADS) was applied before the procedure and an EBUS-TBNA specific self-assessment questionnaire was provided to all patients before and after the procedure. Satisfaction was determined by patient's willingness to repeat the exam. Adverse events during the exam were also compared.

Results: One-hundred and fifteen patients were randomized in two groups: Group 1 - 59 (51.3%) and Group 2 - 56 (48.7%). Gender, age and education degree were similar in both groups ($p = 0.146$, $p =$

0.644 and $p = 0.883$, respectively), (Group 1: 64.4% men, mean age 60.6 ± 13.1 years; Group 2: 76.8% men, mean age 59.5 ± 12.6 years). The percentage of smokers was statistically higher in group 2 (42.9% vs 27.1%, $p = 0,015$). All patients completed the HADS scale and patient-satisfaction questionnaire. Regarding HADS scale, 13 (11.3%) patients were considered to have psychopathology and 27 (23.5%) used psychiatric drugs, but there were no differences between groups ($p = 0.763$ and $p = 0.948$, respectively). According to EBUS-TBNA specific questionnaire, the greatest fear was the result of EBUS and this was independent of the anaesthetic method. Most patients (82 - 71.3%) did not mention unpleasant moments or complaints during the exam. The most commonly reported symptom was cough (7%). One-hundred-five patients (91.3%), independently of the group, reported they would repeat EBUS-TBNA ($p = 0.460$). Among the seven patients that wouldn't repeat the exam, five (71.4%) belonged to the general anaesthesia group. Regarding haemodynamic stability, systolic and diastolic blood pressure before and after the procedure were higher in group 1 than in group 2, and the difference was statistically significant. There was no significant change in heart rate or oxygen saturation between groups, before and after the procedure. Minor adverse events occurred in 9.6% and broncho/laryngospasm was the most frequent, without statistical difference between groups ($p = 0.683$).

Conclusions: In this study, patient's satisfaction and comfort were independent of the anaesthetic method. EBUS-TBNA can be safely performed under intra-venous sedation with spontaneous breathing, without compromising patient's comfort.

Key words: EBUS-TBNA. Sedation. General anaesthesia. Satisfaction.

CO 050. FIBEROPTIC BRONCHOSCOPY - THE REFERENCE PROCEDURE IN A PULMONOLOGY DEPARTMENT

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Introduction: Fiberoptic bronchoscopy (FB) is one of the preferred diagnostic techniques in Pulmonology, with a crucial importance in the diagnosis of most diseases with pulmonary involvement and affirming the importance of the specialty within Medicine. The diagnostic yield of this technique is associated firstly with a correct clinical evaluation and correlation with imaging results and secondly, with a technical skill and accuracy of each center to interpret endoscopic findings on the one hand, and optimize crops for organic products in order to answer to the diagnostic hypotheses. The review of the experience of each center is to the authors an important exercise of reevaluation of the diagnostic yield of this procedure.

Objective: Description and analyze the diagnostic yield of FB held in Respiratory Endoscopy Sector of Egas Moniz Hospital from June 2014 to May 2015 (12 months).

Methods: Retrospective review of reports and analytic results of patients undergoing FB. The authors analyzed: demographics, provenance of patients, indications categories, endoscopic findings, diagnostic yield.

Results: 426 FB were done; of which 289 (67.8%) were male patients. The average age was 64.7 years (minimum age 18, maximum age 93). 193 procedures were requested by outpatient medical specialties, being pulmonology the most frequent (168), 6 by Emergency Department of Pulmonology, 19 by Intensive Care Units and 208 by Inpatient Departments of the Hospital (most often Pulmonology, Internal Medicine and Infectiology). The most frequent indications categories were: suspected lung cancer (34.3%), microbiological diagnosis of infectious diseases (27.7%) and research for interstitial lung diseases (12.7%). The main endoscopic

findings were: mucosal infiltration (14.5%), endobronchial mass (13%), reduction of bronchial diameter (10.1%), signals due to extrinsic compression (6.8%); 234 FB (54.9%) had no visible changes. The following procedures were performed: bronchial washings (99.1%), bronchoalveolar lavage (36.6%), bronchial biopsies (34.3%) and bronchial brushing (9.4%). The diagnosis was made in 196 (46%) patients. The diagnosis performance according to the main indications was: suspected lung cancer 72 cases (49.3%), respiratory infections 45 cases (38.5%) and interstitial lung disease 8 cases (14.8%). Only 19 FB (4.5%) had complications, considered self-limiting.

Conclusions: FB indications are very diverse, playing a crucial role in the diagnosis and follow-up of cancer, infectious lung diseases and evaluation of interstitial lung disease. The FB showed a significant diagnostic yield, especially in neoplastic research and microbiological etiology. Being an easy, safe, well tolerated procedure to perform, safe and well tolerated, with proven diagnostic yield, has emerged as one of the main diagnostic methods in the field of Pulmonology.

Key words: Respiratory endoscopy sector. Fiberoptic bronchoscopy. Diagnostic yield.

CO 051. BLIND PLEURAL BIOPSY IN THE DIAGNOSIS OF MALIGNANCY - A RETROSPECTIVE ANALYSIS.

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Introduction: The identification of malignant cells in the pleural fluid (PF) cytology or histological samples translates advanced disease and is associated with lower survival. Lung cancer is the most common cancer that metastasizes to the pleura, especially adenocarcinoma due to its location. The biochemical characteristics of malignant PF in about 95% of cases show an exudate, in which lower glucose and pH levels are associated with a worse prognosis. The profitability of the blind pleural biopsy (PB) in the diagnosis of cancer, particularly in the lung, is a controversial subject, because current data show a low profitability and it is debatable its usefulness when compared with other pleural techniques.

Objective: To analyze the characteristics of the PF and the contribution of blind PB in the diagnosis of malignant pleural involvement.

Methods: A retrospective review of all patients undergoing blind PB in the interventional techniques Unit of the Pulmonology Department of Coimbra University Hospital. Patient medical files were analyzed for the following data: demographic variables, PF features including cytology, PB results and mortality. The chi-square test was used to assess statistical differences of the PF features depending on the clinical course of patients.

Results: Blind PB was carried out in 25 patients with a mean age of 67 years, 52% female. All had exudates pleural effusion characteristics. PF cytology was diagnostic for cancer established 8 patients, of which 6 were had lung cancer (5 adenocarcinoma and one squamous cell carcinoma). PB identified 2 patients with pleural metastasis, 1 case secondary to pulmonary adenocarcinoma and the other due to an osteosarcoma. The sensitivity, specificity, positive and negative predictive value of PF cytology in the diagnosis of neoplasia was 89%, 100%, 100% and 94% respectively; blind PB was 22%, 100%, 100% and 70% respectively. Of the total of these patients, 6 died (2 with lung cancer. There was no statistically significant differences in the glucose, pH and LDH values of the PF of alive patients and those who died.

Conclusions: In this analysis, the addition of blind PB to PF cytology slightly increased the diagnostic sensitivity for cancer. These results are similar to those reported in the literature suggesting that the

diagnostic yield of blind PB in the diagnosis of cancer is low and that therefore the medical thoracoscopy is likely to have an important role in this field.

Key words: *Pleural biopsy. Malignancy.*

CO 052. BRONCHOALVEOLAR LAVAGE IN THE HAEMATOLOGICAL MALIGNANCIES: WHAT ROLE?

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Introduction: The bronchoalveolar lavage (BAL) is often used in diagnostic evaluation of lung infiltrates in hematologic malignancies (HM) and hematopoietic cell transplantation (HCT). Although the yield of BAL is well established, diagnostic utility and impact on treatment in this particular group of patients is controversial.

Objective: To assess the BAL diagnostic yield and its impact in treatment of respiratory conditions in patients with HM and/or HCT.

Methods: Retrospective study of patients with HM and/or HCT undergoing bronchoscopy (BC) with BAL within 5 years.

Results: We identified 100 patients with HM and/or HCT, with a mean age 56.6 years (SD 15.5), 60% male. The main hematologic diagnosis were 48% lymphomas, 26% acute leukemias, 11% multiple myeloma and 9% chronic leukemias. At time of BC, 41% patients were under induction/consolidation chemotherapy, 29% without treatment, 14% relapse or resistant disease, 12% autologous HCT. The mean Charlson comorbidity index was 4.7 (SD 2.5). About 72% patients were under empirical antibiotic therapy for more than 72 hours, 47% on invasive or non-invasive mechanical ventilation (MV), 11% neutropenic and 69% had bilateral/diffuse radiological changes, more frequently consolidation (48%) or ground glass (20%). The overall microbiological yield of BAL was 33%, higher in MV (46.8%). Most commonly isolated microorganisms were *Candida albicans* (12%), methicillin-resistant *Staphylococcus aureus* (8%) and *Pseudomonas aeruginosa* (4%). Only 1% evidenced malignant cells compatible with HM. Therapy was changed by only 19%.

Conclusions: BC is an attractive technique because of its diagnostic capability and easy use in critical ill patients. However, there was a small percentage of overall BAL diagnostic yield and treatment modifications. This may be due to the fact that the majority of patients were under antibiotic scheme at the time of BAL. This raises the question of BAL's indication in these particular patients and, the most appropriate time to carry out, in order to increase BAL diagnostic yield.

Key words: *Bronchoalveolar lavage. Hematologic malignancy. Hematopoietic cell transplantation.*

CO 053. THE ROLE OF PALLIATIVE RADIOTHERAPY IN LUNG CANCER - A 5-YEAR EXPERIENCE OF A ONCOLOGIC PULMONOLOGY UNIT

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Introduction: In most cases lung cancer is diagnosed at an advanced stage or progresses requiring palliative care. Palliative radiotherapy aims symptomatic control and improved quality of life. Can be used for pain control, hemoptysis, superior vena cava syndrome (SVCS), airway obstruction or other symptoms resulting from mediastinal involvement or distant disease.

Objective: Evaluation of lung cancer patients submitted to radiotherapy with palliative intent.

Methods: Retrospective study of patients with lung cancer followed in an Oncologic Pulmonology Unit that performed palliative radiotherapy between January/2010 and December/2014. Demographic data were collected, performance status (PS) by Zubrod Scale (Eastern Cooperative Oncology Group), characteristics of oncological disease, indications for radiotherapy, dosimetric scheme, complications and outcome.

Results: We analyzed 98 radiotherapy episodes in 83 patients, corresponding to 46.2% of total radiotherapy episodes in patients with lung cancer (curative, palliative and prophylactic brain irradiation). Of these patients 80.7% were men, mean age 64.2 ± 11.1 years and 83.3% smokers/ex-smokers. The treatment was performed strictly on an outpatient in 74.5% of cases. The main histological types treated were adenocarcinoma (31.6%), squamous cell carcinoma (28.6%) and small cell lung cancer (24.5%). The distribution of patients by stage was IV (91.8%), IIIB (5.1%), IIIA (2%) and IIB (1%). The PS was ≥ 2 in 68.4% of cases. The indications at thoracic level were bone metastases (24.5%), primarily to pain control, SVCS (12.2%), pleural metastasis/chest wall invasion (6.1%), hemoptysis (5.1%), tracheobronchial obstruction (1%) and esophageal compression (1%). At the extra-thoracic level was performed by metastasis on brain (28.6%), bone (14.3%), lymph node (6.1%) and eye (1%). The mean time from the radiotherapy indication until its onset was 9.2 ± 7.4 days. In 84.7% of the episodes it was achieved the planned total dose. Regarding response, there was symptomatic improvement in 44.9% of cases and a complete response in 27.6%, with no changes in 9.2% and initial worsening of the symptoms in 4.1%. There were complications in 12.1% of cases and only extra-pulmonary: dermatitis 6.1%, oesophagitis 2%, fatigue 1%, hematologic toxicity 1%, radiogenic colitis 1% and cognitive deficit 1%. The existence of complications was not statistically significant associated with age or delivered dose. The median overall survival was 10 months and overall survival at 1 and 3 years was 43.9% and 10% respectively. There were new cancer progression in 89.6% of cases and 10.4% were stable disease.

Conclusions: Radiotherapy has numerous applications in the palliation of symptoms and was effective leading to partial or complete symptomatic improvement in most cases. The delay time for the treatment start was within the acceptable according to the standards of good practice. Most treatments were performed on an outpatient and have reached the planned total dose. The occurrence of complications was reduced and exclusively at extrapulmonary level.

Key words: *Lung cancer. Palliative radiotherapy. Complications. Survival.*

CO 054. ANALYSING LUNG CANCER MOLECULAR ALTERATIONS THROUGH NEXT GENERATION SEQUENCING (NGS) IN SMALL TUMOUR BIOPSIES

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Introduction: Lung cancer is a leading cause of cancer mortality and has a dismal prognosis. At present, a strategy of molecular driven therapy implies the sequential detection of specific genetic alterations, frequently compromised by the lack of tumour sample and which is time consuming. *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. In this study, we used the Ion Torrent next-generation sequencing (NGS) technique, with a designed

panel of genes, to analyse tumour samples of patients with lung adenocarcinoma.

Methods: Patients with stage IIIB/IV lung adenocarcinoma were included. The Ion AmpliSeq Colon and Lung cancer panel was applied to tumour specimens obtained from small biopsies or cytology, to analyse hotspot and targeted regions of 22 genes implicated in colon and lung cancers by CNGS technology. Mutations were described and reviewed with focus on those clinically relevant. Results obtained by NGS were compared with those identified by standard techniques and sporadic cases confirmed by Quantitative real time PCR and digital PCR assays.

Results: Twenty seven patients were studied, 6 had an EGFR mutation by Sanger sequencing, 5 ALK translocation by FISH and the remaining were negative for both alterations. Sixteen (59%) male patients, with mean age of 67.8 years, $sd = 12.1$. Using Ion AmpliSeq, in 21 cases (78%) at least one mutation was found. TP53 in 11 (41%), KRAS in 8 (30%) and EGFR in 8 (30%) samples. Sporadic mutations found were ERBB2, NRAS, STAK11, MET, PIK3CA, SMAD4. The 6 negative samples correspond to 4 patients with wild type EGFR tumours and 2 with ALK translocations. Four were cytology samples and 2 lung core needle biopsies. Comparing with standard mutation techniques, regarding EGFR status, Ion AmpliSeq detected 5 among the 6 EGFR mutated patients (4 exon 19 deletions, 1 exon 21 point mutation p.L858R, and 1 exon 20 insertion) and 3 additional cases (1 case with 2 unknown mutations, 1 case with exon 19 (L747S) rare mutation and 1 case with p.L858R in exon 21). Among patients with ALK translocations by FISH, 1 had TP53 and KRAS mutations, 1 a KRAS mutation, 1 TP53 and in 2 cases no mutations were found.

Conclusions: NGS using the Ion AmpliSeq technique is an advantageous tool for gene mutation screening in lung adenocarcinoma small biopsies and cytological samples. It allowed the identification of unknown mutations with impact in therapeutic options and the identification of new cases candidate to targeted therapies. Also, KRAS mutations were found in two ALK translocated patients, this is a never described association, which may have prognostic impact and influence on tyrosine kinase inhibitors efficacy. These facts, all together, highlight the need of a comprehensive genomic approach of lung cancer.

Key words: Lung cancer. Next generation sequencing. Mutations.

CO 055. MALIGNANCY AFTER LUNG TRANSPLANT: RETROSPECTIVE ANALYSIS

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Introduction: Several studies have shown that solid organ transplant recipients have an approximately three to four-fold increased risk of developing cancer compared with the general population. Among the risk factors stand out immunosuppressive agents and some oncogenic viruses. In patients with lung transplant the most common are skin cancers, lymphoproliferative disorders and lung cancer. Purposes: Analyze the incidence of neoplasms in patients undergoing lung transplant in Portugal between June 2001 and June 2015.

Methods: Retrospective analysis of the medical records of transplant patients in this period. Relapses were considered as a single tumor.

Results: Among the 123 recipients of lung transplant in this period, we have identified a total of 7 malignancies (5.7%) respective for 5 patients: 3 cases of cutaneous squamous cell cancer (2.4%), 1 lymphoma (0.8%), 2 squamous lung cancers (1.6%) and 1 gastric adenocarcinoma (0.8%). The average time between lung transplant and diagnosis of the first cancer was 37.8 months. All patients

were male and the age average at the time of diagnosis was 61 years. The primary diagnosis were chronic obstructive pulmonary disease and idiopathic pulmonary fibrosis. The immunosuppressive regimen performed by patients was: tacrolimus/cyclosporine, mycophenolate mofetil/azathioprine or, less frequently, sirolimus. All patients underwent immunosuppression induction with polyclonal immunoglobulin. Two patients with skin tumors had recurrent disease and to whom was performed an excision. Two of the patients with cutaneous carcinoma would develop another cancer (lymphoma and gastric cancer) having undergone respectively, chemotherapy and surgery. The two cases of lung cancer occurred in the native lung of transplant recipients for COPD. Among the patients, three died, only two of causes directly related to cancer (lymphoma and gastric cancer).

Conclusions: We noted an increased incidence of skin tumors, in particular, squamous cell carcinomas. In over half the cases there was recurrence of the tumour. As described in other series, all the cases of lung cancer occurred in the native lung and were non-small cell cancers. We have found, however, a lower incidence of lymphoproliferative diseases than what is described in the literature and an unusual case of gastric adenocarcinoma. In these patients is essential to ensure adequate surveillance (institution of screening protocols), in order to make an early diagnosis of cancer and to initiate treatment.

Key words: Lung transplant. Cancer. Immunosuppression.

CO 056. NON-SMALL CELL LUNG CANCER STAGE III - RETROSPECTIVE ANALYSIS OF 92 CASES

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Introduction: Locally advanced disease (stage III) accounts for 30% of patients with NSCLC. The large heterogeneity of different pathological conditions that are still included in stage III makes his treatment very difficult and controversial.

Objective: Description of the epidemiological and clinical characteristics of patients with NSCLC stage III followed in Pulmonology Oncology outpatient clinic. Assessment of progression-free survival (PFS) and ascertainment of possible predictive factors for prognosis.

Methods: Retrospective analysis of patients diagnosed with lung cancer between January 2012 and December 2014 observed in Pulmonology Oncology outpatient clinic at Centro Hospitalar de São João. Of a total of 423 patients with lung cancer were selected and analyzed those with NSCLC in stage III. The date of study completion was June 30, 2015.

Results: From a total of 356 patients with NSCLC were identified 92 (25.8%) patients in stage III: 81 (88%) men; 73 (79.3%) smokers/ex-smokers; average age at diagnosis of 66.2 ± 10.7 years. The performance status, assessed by the Zubrod scale, was ranked 0-1 in 79 (85.9%) cases. Adenocarcinoma was the most common histological type ($n = 46$; 50%), followed by squamous cell carcinoma ($n = 40$; 43.5%). Concerning the first option for treatment, 48 (52.2%) patients underwent combined treatment, 30 (32.6%) chemotherapy, 7 (7.6%) radiotherapy and 7 (7.6%) only best supportive care. Of the 48 patients who underwent combined treatment, the surgical option was possible in 6 patients. The estimated median PFS was 8.9 months (95% CI: 6.2-11.5). In 25 (27.2%) patients were not objectified progression at the end of the study. Multivariate analysis of possible predictive factors for prognosis (including gender, age at

diagnosis, smoking history, performance status-Zubrod, histological type and staging) revealed that age ≥ 65 years, the performance state Zubrod ≥ 2 and squamous histology influence negatively the PFS (HR: 2.26, 95% CI 1.33-3.83, $p < 0.01$; HR: 2.34, 95% CI 1.20-4.60, $p = 0.01$; HR: 1.69, 95% CI 1.09-2.60, $p = 0.02$, respectively). **Conclusions:** About one quarter of patients with NSCLC had stage III at diagnosis, most men and with smoking history. Noteworthy the presence of a good performance status in over 85% of patients. The estimated median PFS was similar to that described in other series, being predictive factors for this outcome age, performance status and histological type.

Key words: Non-small cell lung cancer. Locally advanced disease. Progression-free survival. Predictive factors for prognosis.

CO 057. SURGERY IN LUNG CANCER - STABILIZATION OR CHANGE?

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Objective: Compare two patient groups that underwent lung neoplasia surgery.

Methods: Retrospective analysis of clinical progress in patients that underwent surgery as treatment for lung neoplasia in two distinct periods, from 2000 to 2003 (00/03) and from 2008 to 2012 (08/12). We analysed demographics, smoker status, histological type, clinical stage, surgery, presence of lymphatic embolism and pleural invasion. Statistical analysis was done using SPSS 20, using chi-squared and t-Student test for independent variables.

Results: We obtained a sample size of 128 individuals of which 68.8% were male. The average age was 67.7 ± 10.4 years, 64.1% being smokers of an average of 46.9 pack-year. The most frequent histological type was adenocarcinoma in 60.9% of cases, followed by epidermal carcinoma in 31.35. Clinical stages most frequently observed were Ib in 31.3%, Ia in 23.4% and IIIa in 22.7% with a performance status from 0 to 1 in every patient. With regards to surgeries, 67.2% were lobectomies and 18% were pneumonectomies. In all observed cases, 29.7% presented lymphatic embolism and pleural invasion was observed in 44.5% of cases. Comparative analysis of indicated periods revealed statistically significant differences ($p < 0.001$) in: the number of smokers (in 00/03 - 56.4% against 08/12-28.8%) and ex-smokers (in 00/03 - Ia and Ib in 45.5% against 08/12 de 61.6%); better performance status in 08/12 (PS 0 at 54.8%); surgery performed with the highest proportion of lobectomies in 08/12 (74.0% compared to 00/03 (58.2%); lower prevalence of lymphatic embolism (only 12% in 08/12 compared to 47.3% during 00/03) as well as pleural invasion (24% of cases in 08/12 compared to 70.9% in 00/03).

Conclusions: In the most recent period (2008-2012) we found a higher percentage of ex-smokers vs smokers, detection of a precocious clinical stage and better performance status. Consequently there was a significant percentage of lobectomies and pathological evaluation of tissue samples showed lower presence of lymphatic embolism and pleural invasion.

Key words: Lung. Cancer. Surgery.

CO 058. LUNG CANCER IN ADVANCED STAGE - RETROSPECTIVE ANALYSIS OF THREE YEARS AT A UNIVERSITY HOSPITAL

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Introduction: Lung cancer (LC) is the leading cause of cancer death worldwide. It has higher incidence in older ages and their frequency has been increasing trend. In most cases present in advanced stages, precluding curative treatment, and leads a poor prognosis.

Objective: To identify and characterize the population of patients with LC in an advanced stage.

Methods: Retrospective study of 423 patients newly diagnosed with LC performed in a central hospital of 01/01/2012 to 31/12/2014. We only analyzed patients followed in Pulmonology Oncology consultation, diagnosed with non-small cell lung cancer (NSCLC) or small cell lung carcinoma (SCLC), in III-B or IV stage.

Results: We identified 264 (62.4%) patients with LC in III-B or IV stage, 206 (78%) were males with a mean age of 66.6 years (SD 10.2). Smoking history was present in 197 (74.7%) patients. The initial presentation was as central mass in 96 (36.4%) patients, 85 (32.2%) peripheral mass, 51 (19.3%) peripheral nodule, 19 (7.2%) pleural effusion and in 9 (3.4%) atelectasis. Adenocarcinoma was identified in 144 (54.5%) patients, followed by squamous cell carcinoma in 63 (23.9%), SCLC in 41 (15.5%), NSCLC not otherwise specified in 9 (3.4%), neuroendocrine carcinoma large cell in 5 (1.9%) and sarcomatoid carcinoma in 2 (0.8%). The search for EGFR mutations and ALK translocation were recorded in 87 (33%) patients. EGFR activating mutations were found in 17 (6.4%) patients and ALK translocations in 7 (2.7%). In the initial stage, 62 (23.5%) patients were in III-B stage and 201 (76.5%) in IV, 140 (53.4%) with M1b metastasis and 54 (20.5%) M1a. In the evaluation of *performance status* (PS) to the presentation, 202 (76.5%) patients had PS 0-1, 39 (14.8%) PS 2, and 23 (8.7%) PS 3-4. First-line treatment was performed in 173 (65.5%) patients with chemotherapy alone, 40 (15.2%) with chemo-radiotherapy, 1 (0.4%) with radiotherapy alone and 5 (1.9%) with TKIs inhibitors. 39 (14.8%) patient were submitted to best supportive care (BSC). After progression, 81 (30.7%) patients were submitted to second-line chemotherapy and 18 (8.0%) to third-line. Regarding response to first-line treatment, 46 (17.6%) patients obtained a partial response, 40 (15.2%) stabilization, 1 (0.4%) complete response, and the majority ($n = 170$, 64.4%) progressed. The median progression-free survival was 5.9 months (0-42.0). During the follow-up period 176 (66.7%) patients died and 81 (36.0%) remain alive. The median survival rate was about 1.9 months in BSC group and 10.9 months in those submitted to anticancer treatment.

Conclusions: In this patient population, there is a predominance of male gender and adenocarcinoma. The majority of patients presented with stage IV with M1b distant metastasis at diagnosis, despite a good PS. It was possible to performed specific anticancer treatment in most of cases. An important number of patients performed second-line chemotherapy. The overall median survival was acceptable.

Key words: Lung cancer. Adenocarcinoma and advanced stage.

CO 059. IMPORTANCE OF A PNEUMOLOGY OUTPATIENT CLINIC DURING AN OUTBREAK OF LEGIONNAIRES' DISEASE IN VILA FRANCA DE XIRA

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Introduction: *Legionella pneumophila* is a known pathogenic agent responsible for severe pneumonia, with increasing incidence and an estimated mortality rate of 16 to 30%. On the 7th of November 2014 an outbreak of Legionella was identified in Vila Franca de Xira.

This was considered the second largest outbreak in the world, with 377 confirmed cases and a mortality rate of 3.5% (14 deaths). Most of the patients were either observed, admitted or re-evaluated at Hospital de Vila Franca de Xira (HVFX).

Objective: Descriptive analysis of the patients evaluated after the episode of pneumonia. This evaluation was carried out by the Pulmonary Unit of HVFX in the context of the outbreak, and as a means of supporting the emergency department (ED) and the Wards by ensuring a timely post-discharge follow-up.

Methods: Longitudinal retrospective study of a cohort of patients evaluated in our outpatient clinic with confirmed and probable *Legionella pneumoniae*. The epidemiological data of all patients was collected, along with comorbidities, smoking habits, clinical presentation, diagnostic methods, Unit where the patient was admitted, antibiotics prescribed, complications and follow-up. The statistical analysis was carried out using SPSS version 23.

Results: A total of 225 patients were observed and of these 162 were analyzed - 140 were confirmed cases, and 22 were identified as probable. The mean age was 59 years, 60% were male and the county most involved was Póvoa de Santa Iria. The most prevalent associated comorbidities were smoking (60%), hypertension (53%) and diabetes (26%). Only 7% of the patients had no prior history of comorbidities. Clinical presentation was as commonly described in the literature. Positive *L. pneumophila* antigenuria was present in 80% of the cases, 6% had isolation of *L. spp* in sputum culture and 6% had seroconversion. Hospital admission was necessary in 88% of the patients, 25% were admitted to the ICU and 8% needed invasive mechanical ventilation.

Conclusions: *Legionella pneumophila pneumoniae* can result in a severe clinical condition. In the context of an outbreak, the timely organization of a coordinated action protocol with a well-structured outpatient clinic can help an overloaded health system. This strategy may lead to a reduction in the number of Hospital admissions, with the confidence that patients have an adequate and timely follow-up. It may also supply data that in the future may be useful in similar situations.

Key words: *Legionella. Outbreak. Pneumonia.*

CO 060. COPD AWARENESS CAMPAIGNS: A THREE-YEAR ANALYSIS

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Introduction: Chronic obstructive pulmonary disease (COPD) is responsible for significant morbidity and mortality in Portugal, with an estimated prevalence of 10% to 14%. It constitutes a major public health problem and its early diagnosis is priority.

Objective and methods: From 2012 to 2015, the Pulmonology Department at Hospital de Braga developed awareness campaigns regarding COPD and other respiratory diseases on World COPD Day, in which participants answered a questionnaire and performed a spirometry. The main objectives of this work were to explore participants' knowledge about COPD and spirometry, to determine the prevalence of COPD risk factors, known respiratory diseases and comorbidities and to analyse the spirometric results.

Results: The sample included 489 participants (51% males, mean age 58 ± 12 years, mean BMI 27 ± 4 kg/m²), mainly with a low education level. Around a fifth of them admitted to have ever heard about COPD or spirometry and to have ever performed a spirometry. Less than half of them (41%) had a smoking history, 21% smokers and 23% former smokers, with a mean 20 ± 18 (1-92) pack-year. Around 38% referred smoking passive exposure and the majority admitted exposure to noxious particles, whether work-related (43%) or at home (48%). A quarter of the participants had a known respiratory disease and the commonest were COPD (29%), asthma (29%) and rhinosinusitis (27%); 15% stated a previous respiratory disease,

mainly tuberculosis (52%) or pneumonia (38%). The most frequent comorbidities were cardiovascular risk factors (62%), allergies (29%), depression (21%), osteoporosis (19%) and gastric pathology (15%). In respect to spirometry results, an obstructive pattern was observed in 11%, with a mean FEV₁, FVC and FEV₁/FVC of 70%, 88% and 64%, respectively.

Conclusions: Underdiagnosis of COPD is a well-known problem. These campaigns raised awareness about respiratory diseases and disclosed COPD as an important cause of morbidity and mortality.

Key words: *COPD. Diagnosis. Awareness.*

CO 061. LUNG TRANSPLANT IN PULMONARY INTERSTITIAL DISEASES: THE PORTUGUESE EXPERIENCE

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Introduction: The pulmonary interstitial diseases are a heterogeneous group of diseases with specific features, and one of the main causes of lung transplant.

Objective: The aim of this study is to characterize and evaluate the outcomes of a patients' population with pulmonary interstitial disease that were submitted to lung transplant (LT) at our Centre.

Methods: Retrospective analysis of the clinical files from patients with pulmonary interstitial diseases submitted to lung transplant between January/2008 and June/2015. We compared demographic and clinical variables using the Chi-square test or the Fisher's exact test for categorical variables and the Student's t-test for continuous variables. Absolute survival probability was estimated by the actuarial method and Cox proportional-hazard model was also employed.

Results: From a total of 101 patients, 53 (52.5%) were submitted to LT due to pulmonary interstitial diseases, with mean age (SD) 49.2 (9.5) years, in which 30 (56.6%) were male. At the time of referral, the most common diagnosis were extrinsic allergic alveolitis (EAA) (n = 17; 32.1%), idiopathic pulmonary fibrosis (IPF) (n = 15; 28.3%), other idiopathic interstitial pneumonia (IIP) (n = 7; 13.2%), pneumoconiosis (n = 6; 11.3%), sarcoidosis (n = 5; 9.4%) and others (n = 3; 5.3%). At the moment of the transplant, the mean time of disease progression was 7.6 (5.2) years, being significantly less in the group of patients with IPF 4.9 (5.2) years, when compared with the rest of our population (p < 0.05). The mean time on waiting list was 11.3 (10.6) months. The majority of patients were submitted to single lung transplant (n = 47; 88.7%). In 41 (77.4%) patients the identified histological pattern in the resected lung was exclusively usual interstitial pneumonia (UIP), in the remaining it was identified a mixed pattern between UIP and histological findings from the primary disease. The cumulative survival rates at 1, 2, 3 and 5 years was 80%, 74%, 66%, and 57%, respectively. Statistical significant differences in survival rates were not found between groups with different interstitial pulmonary diseases, and also between the group of patients with interstitial pulmonary diseases and others.

Conclusions: The interstitial pulmonary diseases were responsible for the majority of lung transplants. The IPF has an accelerated progression to terminal disease making its early referral of extreme importance. In our Centre, the survival rate in the group of patients with interstitial pulmonary disease is similar to the remaining groups.

Key words: *Lung transplant. Pulmonary interstitial diseases.*

CO 062. TRANSBRONCHIAL CRYOBIOPSY IN THE DIAGNOSIS OF DESQUAMATIVE INTERSTITIAL PNEUMONIA

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Introduction: Desquamative Interstitial Pneumonia (DIP) is a rare interstitial pneumonia related with smoke. Traditionally the diagnosis required a histology sample obtained by open lung biopsy. However the recently described transbronchial cryobiopsy seems to provide all the histologic features required for a precise diagnosis in a less invasive way.

Objective: Evaluation of patients with the DIP diagnosis obtained with transbronchial cryobiopsy, namely the diagnostic accuracy of this new endoscopic technique in this disorder.

Methods: Retrospective analysis of the patients with DIP diagnosis who performed transbronchial cryobiopsies at Centro Hospitalar São João. The patients were sedated by an anesthesiologist and intubated under a rigid bronchoscopic and a jet-ventilation was used. Endoscopic exploration of the bronchial tree was performed through the endotracheal tube using a video bronchoscope and a Fogarty catheter was introduced in the selected lobe. Subsequently, directed under fluoroscopic control the transbronchial biopsy was then performed using a cryoprobe. The cryoprobe introduced through the flexible bronchoscope work channel was a flexible probe, 2.4 mm in diameter and 900 mm in length, which was connected to the cryotherapy equipment (ErbokryoR CA, Erbe, Germany). The tissue is frozen following the Joule-Thomson principle, using gas decompression (carbon oxide) at the tip of the probe.

Results: Five patients with DIP diagnosis obtained by transbronchial cryobiopsy were included. Their mean age was 45.2 ± 8.5 years, 4 were women and all of them were active smokers. Three patients had dyspnea on exertion, one dry cough and one had no relevant respiratory symptoms. All of them had mild impairment in diffusion capacity (DLCO- $57.5 \pm 8.4\%$) and three had a moderate restrictive ventilatory pattern (CVF- $64.9 \pm 8.2\%$). All of them had ground glass pattern with predominance in the lower lobes at chest high resolution computed tomography scan. Two patients had eosinophilic alveolitis on bronchoalveolar lavage, while the other three had only higher total cell counts. Regarding to transbronchial cryobiopsy, three patients were submitted to four biopsies, one to three and the other one to only two. The biopsies were performed in different segments of the same lobe in four patients and in two lobes in one. The mean size of the samples was 5 mm (3-8 mm). One patient had a pneumothorax as a complication.

Conclusions: This group of patients confirms that the DIP diagnosis can be established by transbronchial cryobiopsy with efficacy and safety, without the requirement of a surgical lung biopsy.

Key words: Transbronchial cryobiopsy. Desquamative interstitial pneumonia.

CO 063. SINGLE PORT VIDEO ASSISTED LOBECTOMY AND MEDIASTINAL LYMPH NODE DISSECTION FOR PULMONARY CANCER SURGICAL TREATMENT - EXPERIENCE OF A SURGICAL CENTER

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Fundação Champalimaud.

Introduction: In November 2012 we performed the first single port videoassisted (SP-VATS) lobectomy and mediastinal lymph node dissection for pulmonary cancer surgical treatment. Since then, about 90% of these types of surgeries was made using this new surgical technique.

Methods: Analysis of our casuistry of lobectomy and bilobectomy, with mediastinal lymph node dissection, by SP-VATS. Retrospective review of patients undergoing lobectomy or bilobectomy using SP-VATS. Characterization by gender, age, procedure, surgical times, mediastinal nodal dissection, chest tube drainage time and pain, number of days of hospitalization.

Results: Between November 2012 and June 2015, 74 lobectomies were performed by SP-VATS. In 5 cases (6.7%) required conversion to open surgery because of tumor dimensions, absence of fissures or hemorrhagic control. Most patients were female (58%) and the mean age of was 61.7 years. The performed procedures were: lower left lobectomy (10 cases), upper left lobectomy (11 cases), right upper lobectomy (16 cases), right lower lobectomy (22 cases), middle lobectomy (4 cases), bilobectomy (upper plus middle) (6 cases). The average tumor size was $3,4 \pm 2$ cm (1 through 9,8 cm). The mean surgical time was 171 minutes and complete mediastinal nodal dissection was performed in all patients with a diagnosis of malignancy according to oncologic criteria already adopted in open surgery. The average number of explored nodal stations was 4 ± 1 (range 1-6), with a mean of 7 ± 4 (range, 1-18) lymph nodes resected. The average need for chest tube drainage was 2.8 days (2-10 days). Average need for ICU was 22 hours, with an average hospital stay of 5.3 days. Patients had a low level of pain postoperatively with an average of 1.6 in analog scale. There was no mortality or any major complication in this series.

Conclusions: A video-assisted single-port surgery is safe and feasible in the treatment of lung cancer. We found a reduced need for chest tube drainage and hospital stay, a low degree of pain and a faster functional recovery; all this without increasing the risk of the surgery or affecting the efficacy of the mediastinal lymph node dissection.

Key words: Video assisted surgery. Single port. Lobectomy.

CO 064. MALIGNANT PLEURAL MESOTHELIOMA IN SOUTHERN PORTUGAL

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Introduction: Mesothelioma has pleural origin in 80%. Asbestos exposure is the main risk factor for the occurrence of malignant pleural mesothelioma (MPM). The role of smoking and the impact of asbestos exposure duration and intensity in the disease's natural history are not definitive.

Objective: Socio demographic characterization of the population of patients with MPM in the south of Portugal in the last decade (2004-2013) and characterization of the disease. Explore factors influencing the natural history of disease and response to therapy.

Methods: A retrospective cohort study was performed, including patients diagnosed with mesothelioma enrolled in the Registo Oncológico Regional Sul (ROR Sul) between January 2004 and December 2013. We excluded patients without clinical data and without histological diagnosis of mesothelioma. The ROR Sul data were complemented with demographic, epidemiological and diagnostic and treatment information obtained by consultation of the medical records in the hospital where they were treated. Data were analyzed with SPSSv21.

Results: We identified 248 cases of mesothelioma diagnosed between 2004-2013. Of these, 68 cases were excluded based

on the criteria previously referred as well as 28 extra-thoracic mesotheliomas. We analyzed 152 cases of MPM, with male gender predominance (81%). The mean age at diagnosis was 68 ± 10 years. Ninety-two patients (60%) worked as laborers or unskilled labor. Of the 116 patients in whom it was possible to obtain data on exposure, 86 had exposure to asbestos and in 96% that exposure occurred at the workplace. In 30.6% of cases the exposure was direct and occurred mainly in males (96%). All cases of indirect exposure corresponded to the female gender. There was a mean latency of 42 ± 8 years. A current or previous history of smoking was present in 48.6%. On average, clinical manifestations began five months before diagnosis. Diagnosis was achieved in 49% of cases by thoracotomy/thoracoscopy and in 34% by closed pleural biopsy. Epithelioid type was the most common histology (74%). At the time of diagnosis, 52% were in stage IV. In 84% *Performance status* was PS-ECOG 0-1. The 1st line treatment was systemic therapy in 58% and surgery in 24%. Smoking and duration and type of exposure to asbestos did not affect the disease's presentation. There was a longer survival in patients with epithelioid histology (23.5 months vs 10.6 months, $p = 0.004$) as well as in patients with PS 0-2 (21.3 months vs 4.3 months, $p < 0, 0001$). Surgical approach with curative intent was associated with longer survival in stages I-III (41.2 months vs 13.6 months, $p < 0.0001$) but not in IV.

Conclusions: There is a higher incidence of disease in both men and undifferentiated professions. A high percentage of patients had direct exposure, unlike other recent series data. Smoking and the duration and intensity of exposure to asbestos did not affect the latency time. The epithelioid histology and an overall better state at diagnosis were associated with longer survival as described in other series. Surgical treatment in operable stages contributed to increased survival highlighting the importance of staging.

Key words: Pleural mesothelioma. Smoking. Asbestos exposure.

CO 065. OMALIZUMAB FOR SEVERE ASTHMA ASSESSMENT OF THE CLINICAL AND FUNCTIONAL IMPACT AFTER ITS WITHDRAWAL

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Introduction: Omalizumab is a monoclonal anti-IgE antibody approved for the treatment of uncontrolled severe persistent allergic asthma. Several studies have shown its effect, particularly in the reduction of exacerbations, improving symptoms and quality of life. However, there are only a few data about the optimal duration of treatment and the actual effect after its withdrawal.

Objective: To evaluate the effect of treatment with omalizumab during and after its withdrawal.

Methods: Review of medical records of patients followed in severe asthma consultation until June 2015, who have been submitted to Omalizumab treatment and that have already suspended. A current reevaluation was conducted through questionnaires of asthma control and quality of life (Mini Asthma Quality of Life Questionnaire - miniAQLQ), respiratory function tests and fractional exhaled nitric oxide (FeNO).

Results: 10 women were included, all non-smokers, with an average age of 49.5 years. Most had sensitization to 1/+ allergens ($n = 8, 80\%$) and 3 were under systemic corticosteroid therapy. The average total immunoglobulin E was 686.8 IU/L and the mean % of eosinophils in the peripheral blood was 7.787. Patients effected on average 43 months of treatment, and all had a good/excellent response in the Global Evaluation of Treatment Effectiveness scales (GETE) at 16 weeks. At the end of treatment there was

an overall improvement in asthma control [Asthma Control Test (ACT) initial average - 17.7 vs end -24], in the peak expiratory flow (PEF) (initial average 239 l/min versus 291 end l/min), the forced expiratory volume in 1 second (FEV1) (initial average 1.33 L/58.6% versus end 1.49 L/60.5%) and FeNO (initial average 34.71 versus end 28.3 ppb). There was also a reduction in exacerbations (mean/initial year - 5.3 versus final - 0.6) and a suspension of the oral corticosteroid therapy. Omalizumab was stopped in 7 patients for clinical stability, and in the other 3 for complications (1 stroke, 1 breast cancer and another for severe anemia). The median time from discontinuation of therapy was 28 months. Currently, compared to the end of treatment, there was an overall decrease in asthma control (final ACT 24 vs current 19.8), an increase in annual exacerbations (final average 0.6 versus current 2.1), worsening of PEF (end 253 versus current 291) and FeNO (end 28.3 vs current 29.03), but with overlapping FEV1 (final 1.49 L/60.5% versus current 1,45 L/60.8%). Analyzing individually, we observed a decreased asthma control, worsening of FeNO and PEF in 40% of cases, a decrease in FEV1 in 50% and in 40% an increase in exacerbations. Most of the patients currently presents a low miniAQLQ (average 4,826).

Conclusions: This data demonstrate that Omalizumab is an effective treatment in severe uncontrolled asthma. However, completing treatment, the clinical benefit does not seem to hold in all patients and the decision to suspend this therapy should always be considered and taken individually. In the future, further studies will be needed to support these findings and define the optimal duration of treatment.

Key words: Asthma. Omalizumab.

CO 066. ACUTE RHINITIS VS THERMAL SHOCK. WILL THE TEMPERATURE AND ATMOSPHERIC POLLUTION IMPACT ON SLEEP AND SLEEP DISORDERED BREATHING?

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Introduction: There are several diseases that have shown a seasonally behavior. However, there is a few scientific evidence about the impact of seasonality on sleep and sleep disordered breathing, including Obstructive Sleep Apnea (OSA).

Objective: To compare sleep and breathing disorders during sleep between a group of individuals with OSA and a group of healthy subjects in summer and winter, in a pilot study type.

Methods: A sample of 30 individuals referred to our laboratory for suspected OSA was analyzed. Individuals aged 30 to 60 years, all male, were divided into 2 groups: OSA group ($n = 15$) with apnea/hypopnea index (AHI) $\geq 15/H$ and $< 30/H$ and control group ($n = 15$) with AHI < 5 . All of them were subjected to 2 full polysomnography (one in winter and one in summer) with room temperature control and levels of air pollutants. It was considered a significance level of 95%, $p < 0.05$.

Results: In the control group the mean age was 42.4 years with a mean body mass index (BMI) of 26.6 kg/m²; In the OSA group the mean age was 45.6 years with a BMI of 28.1 kg/m². The results are presented in tables 1 and 2.

Conclusions: We found that the seasonal temperature differences and/or air pollution values influence sleep and sleep disordered breathing, leading to worsening of OSA during higher temperatures. However, these results should be confirmed with studies that have a higher number of participants.

Key words: Polysomnography. Temperature. Air pollution. Sleep disordered breathing.

Table 1 CO 066

Summer vs Winter	Lat. N1	Lat. N2	N1(%)	N2 (%)	N3 (%)	REM (%)	Índice Arousal	Efic. Sono
Control Group	z = -1,925 (p = 0,054)	z = -1,677 (p = 0,094)	z = -0,710 (p = 0,478)	z = 1,022 (p = 0,307)	z = -2,343 (p = 0,019)	z = -1,136 (p = 0,256)	z = -1,961 (p = 0,050)	z = -1,704 (p = 0,088)
SAOS Group	z = -2,615 (p = 0,009)	z = -1,763 (p = 0,078)	z = -1,989 (p = 0,040)	z = -0,227 (p = 0,820)	z = -2,708 (p = 0,007)	z = -0,568 (p = 0,570)	z = -0,739 (p = 0,460)	z = -0,284 (p = 0,776)

Lat.N1 = N1 sleep latency; Lat.N2 = N2 sleep latency; N1(%) = percentage of sleep N1; N2(%) = percentage of sleep N2; N3(%) = percentage of sleep N3; REM(%) = percentage of REM sleep; Índice arousal = arousal index; Efic. Sono = sleep efficiency

Table 2 CO 066

Summer vs Winter	IAH	IDR	Hipo	ODI	T90
Control Group	z = -1,364 (p = 0,173)	z = -1,279 (p = 0,201)	z = -1,226 (p = 0,220)	z = -1,250 (p = 0,211)	z = -1,826 (p = 0,068)
SAOS Group	z = -2,840 (p = 0,005)	z = -2,159 (p = 0,031)	z = -0,179 (p = 0,865)	z = -2,443 (p = 0,015)	z = -2,840 (p = 0,005)

IAH = apnea/hypopnea index; IDR = respiratory disturbance index; Hipo = hypopnea; ODI = oxygen desaturation index; T90 = percentage of SpO₂ < 90%

CO 067. SURGICAL APPROACH OF LUNG NODULES UNDER 2CM: ANALYSIS OF 12 CONSECUTIVE CASES

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Introduction: The early detection of small pulmonary nodules with the use of high definition CT scans is more and more frequent. This leads to the diagnosis of early stage lung cancer, pre-invasive lesions and sometimes benign lesions.

Methods: We evaluated twelve consecutive cases of pulmonary nodules under 2 cm, detected in routine exams and discussed in our multidisciplinary meeting from July 1, 2014 to July 1, 2015. The radiological analysis was performed under the Fleischner Society's criteria. The patients underwent minimally invasive thoracic surgery for diagnosis and simultaneous treatment.

Results: Our population consisted of twelve patients (nine female) with ages ranging from 39 to 66 years. Four of them were non-smokers, and two passive smokers. The pathology report of these patients showed one case of invasive adenocarcinoma, five minimally invasive adenocarcinomas, four adenocarcinoma "in situ", one adenomatous atypical hyperplasia and two benign scar lesions. One of this patients had multiple synchronous lesions and another had previously been treated for another lung cancer 6 years before. All surgeries were performed by VATS. Five were wedge resections, four anatomic segmentectomies and three lobectomies. There is no mortality in this series and the only morbidity was one case of prolonged air leak that was resolved with a conservative approach.

Conclusions: The incidence of adenocarcinoma in the patients with suspicious small nodules in high definition CT is significant. The early detection and surgical excision can have a very good prognosis. The minimally invasive approach is safe and has many advantages even when there are synchronous bilateral lesions.

Key words: Early lung cancer. VATS. Thoracic surgery.

CO 068. SOLITARY FIBROUS TUMOUR OF THE PLEURA - CLINICAL MANIFESTATIONS OF AN ENIGMATIC TUMOUR

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Introduction: Solitary fibrous tumour (SFT) is a rare tumour, of uncertain pathological behaviour, with mesenchymal origin. It represents less than 5% of pleural tumours. Frequently, it presents as a pedunculated mass, with origin on the visceral pleura, found incidentally on routine chest radiography, or on chest CT. The tumour may occur in any age group but it is more common in the 6th to 7th decades. More than half (reported 2/3 of the cases) are asymptomatic. The most frequent symptoms are chest pain, dyspnoea and cough but para-neoplastic syndromes have also been described: hypertrophic pulmonary osteoarthropathy with or without nail clubbing (Pierre-Marie-Bamberg syndrome) and hypoglycaemia (Doege-Potter syndrome). We reviewed the clinical registry of patients admitted to our Thoracic Surgery department in the past fifteen years (2000-2015) with the diagnosis of SFT of the pleura.

Objective: We analyze the clinical presentation and correlation of the location, invasion of adjacent structures and recurrence.

Results: We describe a population of 25 patients, aged between 32 and 80 years (median age 61.7), 54% male. 13 of these patients (52%) were symptomatic at time of diagnosis and 4 referred more than one complaint. The most common symptom was chest pain (53%, n = 13), followed by dyspnoea (23%, n = 13). There was one case of acute confusional state and hypoglycaemia, and one case of pulmonary hypertrophic arthropathy with nail clubbing. The average tumour size was 7.9 cm (n = 25). Regarding the symptomatic group, the average tumour size was 10 cm (versus 7 cm in the non symptomatic one), and two of these patients had invasion of adjacent structures - in one case of the diaphragm and in another, of the thoracic wall. When comparing to the asymptomatic group, there were also two cases of diaphragm invasion. 24 patients were elected to surgery. 6 of the symptomatic patients had histological criteria of malignancy (n = 14) while none of the non symptomatic showed these features (n = 8). We observed two cases of recurrence, one in a symptomatic patient that presented with chest pain, and the other in an asymptomatic patient.

Conclusions: SFT is a rare and enigmatic tumour, and besides being frequently presented as a giant mass, has a silent behaviour with paucisymptomatic clinical manifestation.

Key words: Solitary fibrous tumour. Pleura. Mass. Symptoms.

CO 069. EARLY COMPLICATIONS AFTER PNEUMONECTOMY: RETROSPECTIVE STUDY OF 62 PATIENTS

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Pneumonectomy is widely known to be associated with a high morbidity and mortality. However, in some instances, offers the only chance for a cure. We reviewed and analysed the demographic, clinical, functional, and surgical variables of 62 patients, between January 2006 and December 2014. The mean age was 57.8 ± 15.1 years, and 75.8% were male. The overall mortality and morbidity rates were 12.9% and 35.6%, respectively. The indications for pneumonectomy were adenocarcinoma in 30 patients, squamous cell carcinoma in 17, lung sarcoma in 3, lung carcinoid tumor in 4, giant cell carcinoma in 2, and 5 patients having been surgically treated for non neoplastic disease. Operative mortality analysis identified age greater than 65 years, forced expiratory volume in 1 s less than 80% and right laterality of the procedure as risk predictors of mortality. The complications after pneumonectomy were also associated with high mortality. This study provides an overview at the early outcomes of pneumonectomy in our daily practice. Although mortality rates have steadily declined over the last years, morbidity and mortality after pneumonectomy remain significant. The advanced age, FEV₁ less than 80% and right pneumonectomy were related to higher mortality in our practice.

Key words: Lung cancer. Pneumonectomy. Complications.

CO 070. LUNG VOLUME REDUCTION SURGERY - EXPERIENCE OF A THORACIC SURGERY DEPARTMENT

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Introduction: Severe pulmonary emphysema is one of the main diseases that affect quality of life in patients. In these cases, lung volume reduction surgery (LVRS) is an alternative to conservative medical treatment, and can be seen as bridge-to-transplant. It allows an increase in physical capacity and quality of life, despite the fact that some studies show no increase in survival.

Objective: This study aims to show the experience of our department in LVRS, especially in patients with major impact on quality of life.

Methods: A retrospective analysis of all patients submitted to LVRS between September 2000 and July 2015 was done. Respiratory parameters by means of preoperative and postoperative lung function tests, postoperative complications including prolonged air leak, length of stay, oxygen dependency, symptomatic relief, short and long term survival, are analyzed. Patients submitted to single lung transplantation with native lung hyperinflation, who underwent LVRS, were excluded.

Results: A total of 10 patients were submitted to LVRS, age varied between 30 and 76 years, 1 patient was female. 11 LVRS were performed. One patient underwent bilateral procedure on separate occasions. 3 patients were excluded from the study due to previous single lung transplantation. All patients (7) presented with upper lobe predominant emphysema. 4 LVRS were performed by VATS and 4 by thoracotomy. All patients were extubated in the immediate postoperative period. Progressive reduction in supplementary oxygen requirements was noted. Blood gas and clinical parameters were better when compared with preoperative data. There were no postoperative deaths. 4 out of the 8 surgical interventions had postoperative complications; prolonged air leak (3), hemothorax with reintervention (1), atrial fibrillation (1). Average length of stay

was 12 days (5-25). Preoperative and postoperative lung function tests (LFT) were evaluated. A trend toward better LFT after LVRS was noted, with an average increase in FEV₁ of 14.9%. Follow-up ranged between 1 month and 15 years, without mortality. 2 patients are currently on lung transplant waiting list.

Conclusions: Our population showed clinical and LFT improvement, as published in the literature. We conclude that LVRS in highly selective patients is beneficial.

Key words: Lung volume reduction surgery. LVRS. CODP.

CO 071. SURGERY ON PANCOAST TUMOURS - CASUISTIC OF A CARDIOTORACIC SURGERY CENTER

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Introduction: Pancoast tumours are a type of lung cancer defined by their location in the apices with associated clinical symptoms caused by local invasion. It is a rare tumor that represents only 3 to 5% of all pulmonary tumors. The surgical techniques for Pancoast tumours represent some of the most challenging procedures amongst thoracic malignancies.

Objective: Retrospective study of patients with Pancoast tumour submitted to surgery. Literature review on the subject.

Methods: Retrospective analysis including all patients diagnosed with Pancoast tumour submitted to surgery, between April 2006 and July 2015, at a Cardiothoracic Surgery Center. Data on epidemiology, symptoms, tumor characteristics, TNM-stage, therapeutic and survival, concerning the patients submitted to resection surgery with curative purpose. Statistical treatment of the data was conducted. Literature review on the subject.

Results: The sample consists of nine patients, five of which underwent diagnostic thoracoscopy and four resection surgery with curative purpose. The remaining results on this study refer to the second group. The mean age at presentation was 61.5 ± 13.5 years old, with predominance of the male gender (n = 3). The most common presenting symptom was shoulder pain irradiating to the ipsilateral arm (n = 3) and only one patient presented Horner's syndrome. The average size of the tumor was 6 ± 1.5 cm and it was more frequent on the left lung (n = 3). Stage IIIB was the most common at presentation (n = 3). Three patients underwent induction chemo-radiation (CRT) with tumor regression. All patients were submitted to superior lobectomy with *en bloc* resection of the invaded structures. The surgical approaches chosen were Darteville (n = 2) and Shawn-Paulson (n = 2). All patients survived surgery with no major operative complications. Average inpatient length was 7.75 ± 1.1 days. Only non-small cell lung carcinomas (NSCLC) were registered, and adenocarcinoma (n = 2) was the most frequent. Two mortality cases were documented before the five years follow-up.

Conclusions: The results obtained are, mostly, consistent with those registered on the literature. Less than 50% of the Pancoast tumours lesions are considered resectable at initial presentation. The remaining tumours are unresectable, commonly, due to extensive vertebral body involvement, mediastinal nodal disease, or metastatic disease. Biologically, non-small cell Pancoast tumours do not seem to qualitatively differ from NSCLC in general (opposite to what was once suggested). Nevertheless, the outcome of patients with ipsilateral supraclavicular lymph node involvement (stage N3) proved to be better than for the N2 stage. A trimodal approach with induction CRT followed by resection surgery appears to be the best therapeutic option, in most cases. Some series report an approximate 56% decrease in mortality comparatively with the patients submitted to CRT alone. The surgical procedure that the

patients on this study underwent seems to be associated with a better survival rate, according to recent literature.

Key words: Pancoast tumor. Thoracic surgery. Dartevielle approach. Neoplasm staging.

CO 072. THE ROLE OF SINGLE PORT VIDEO ASSISTED SURGERY THORACIC FOR PULMONARY METASTASES TREATMENT

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Fundação Champalimaud.

Surgical resection, driven by good results in terms of survival, has gained an increasingly important role in the approach to the patient with lung metastases. Using thoracoscopy, although less invasive and allowing a faster recovery of the patient, has been the subject of some controversy, because it doesn't allow the safe removal of very small nodules and neither allow the detection of cold nodules (undetected by image studies), a problem we think could be exceeded by using single port video assisted surgery thoracic (SP-VATS). The authors present the results of using SP-VATS in the treatment of 24 patients with lung metastases in terms of drainage and hospital time, pain, number of resected nodes, lymphadenectomy and pathological results. They also compared the number of nodes detected in image studies, preoperatively, with the number of nodes resected pathological and anatomical results. Of the 24 patients, the vast majority were female (70.8%) with a mean age of 55.2 years. Most of the metastases came from the digestive tract (75%). The average surgical time of 92 minutes. In 37.5% cases (9 patients), more nodes were detected than by CT and/or PET-scan preoperatively, and, of these, about 55% were positive in anatomical-pathological examination. The use of SP-VATS allows you to fill the gaps left by thoracoscopy in the treatment of pulmonary metastases, maintaining its advantages. It ensures a faster and less painful recovery for patients, allowing the detection of cold nodules and nodules as small as 2 mm, and a complete lymph node dissection. In our view, it should be the standard technique in treatment of this type of pathology.

Key words: Video assisted surgery. Single port. Pulmonary metastases.

CO 073. SURGERY OF THE TRACHEA AND MAIN BRONCHI: ONE CENTER'S EXPERIENCE

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Introduction: Surgery of the trachea and main bronchi is a complex area of general thoracic surgery. Its rarity and the demanding technical aspects of the bronchi anastomosis and/or tracheal suture translate into a challenge for the thoracic surgeon.

Objective: We aim to present our experience in surgery of the trachea and bronchi, with special focus on its particular technical aspects and postoperative results.

Methods: There was retrospectively analysed data from 18 patients under-going surgery of the trachea or main bronchi in our department between January 2007 and June 2015. Six patients underwent tracheal surgery: 2 patients underwent post-prolonged orotracheal intubation tracheoesophageal fistula correction, 1 patient did tracheal stenosis correction for the same reason and 3 patients underwent surgical repair of iatrogenic tracheal laceration. Surgical approach was transverse cervicotomy in 4 patients, with associated median sternotomy in 2 cases. Regarding bronchi surgery, 11 patients underwent sleeve lobectomy for endobronchial

malignancy and 1 patient underwent the same procedure for an endobronchial growing hamartoma.

Results: The median hospital stay was 13 days in tracheal surgery and 8 days in bronchial surgery. In the case of tracheal surgery, there was a mediastinitis case in a patient with a laceration caused by rigid bronchoscopy. The patient would die for aortic valve endocarditis. In another patient, who underwent excision of 3 rings due to tracheal stenosis, there was an anastomosis dehiscence requiring re-intervention. It was also registered, in a third patient, a late recurrence of a tracheoesophageal fistula, fixed with tracheal prosthesis. Concerning main bronchi surgery, complications were observed in 5 patients: prolonged air leak in 4 and repetition atelectasis in 1 patient. No operative mortality was observed; however, one patient died one month after hospital discharge. In 100% of patients included in this study a pre-discharge bronchoscopy was performed and none had bronchial stenosis or anastomotic dehiscence.

Conclusions: Tracheal and bronchial surgery remains a challenge for the thoracic surgeon. Complications of tracheal surgery are not rare but usually do not influence the final result. Most patients benefit from tracheal resection and mortality is low. The results are dependent upon meticulous technique of dissection and release of the trachea and the degree of extension of the tracheal resection. The selection of patients, adequate planning and timing, as well as a careful follow-up and a close multidisciplinary cooperation are essential for achieving the best outcomes.

Key words: Surgery. Trachea. Bronchi. Sleeve. Lobectomy.

CO 074. MAJOR PULMONARY RESECTION IN PATIENTS OVER 65 YEARS OF AGE: OLDER AGE DOES NOT EQUATE TO MORE RISK

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Introduction: The age threshold for surgery has been defined as the age when the mortality for cardiovascular disease exceeds that for lung cancer. Still a growing number of studies is questioning any difference in morbidity or mortality in patients under 80.

Objective: To analyse the impact of age on the outcome of major lung resection, considering mortality and morbidity.

Methods: Search the center's database for patients 65 or older submitted to major lung resection, from July 1st 2011, to June 31st 2014.

Results: 129 patients were included, 87 male, 42 female, with a mean age of 71 years (SD 4.6). 94 patients between 65 and 74 years, 28 between 75 and 79 years and 7 were 80 years or over. Mean FVC was 101.6% and FEV1 96.5%. There were 24 active smokers (64.94 pack-year, SD 32.9) and 20 past-smokers (50.4 pack-year, SD 29.6). The incidence of COPD was 26.4%. 113 lobectomies, 2 bilobectomies, 1 sleeve lobectomy, 9 pneumonectomies were performed. There was no 30-day mortality, 6 major and 25 minor complications. Mean hospital stay was 7.4 days (SD 5.4). Considering the age groups, there was no difference in FVC (p: 0.181), FEV1 (p: 0.991), smoking (p: 0.472), incidence of COPD (p: 0.834), T or N stage (p: 0.870, p: 0.541). No difference in the incidence of complications (p: 0.780), postoperative bleeding (p: 0.083), air leaks (p: 0.463), or in length of stay (p: 0.922).

Conclusions: Older patients did not have a worse preoperative condition. They were not at an increased operative risk and had postoperative recovery times similar to younger patients. From our experience, this is partly due to an early extubation, usually in the operating room, early mobilisation and intensive pulmonary rehabilitation program.

Key words: Major lung resection. Old age. Surgical risk.

CO 075. SURGERY FOR PRIMARY SPONTANEOUS PNEUMOTHORAX: IS IT WORTH TO PERFORM PLEURECTOMY?

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Objective: Primary spontaneous pneumothorax is a relatively common pathology with an incidence peak in young adults and a high recurrence rate. The evolution of surgery approaches allowed the surgeon, nowadays, to perform effective and safe treatments through minimally invasive approach, although the ideal surgical technique is not clear. The objective of this study was to analyse the surgical outcomes regarding the surgical technique (pleurectomy vs pleural abrasion without pleurectomy).

Methods: Between January 2005 and December 2014, 202 patients with primary spontaneous pneumothorax were submitted to surgery. There were 168 patients eligible to the study, since 34 patients

performed other surgical techniques as talc poudrage. Patients mean age was 29.9 ± 12.4 years and 21.4% were female. Right pneumothorax was more frequent (53.6%). All patients underwent apical resection and were divided into two groups according to the method of pleurodesis: pleurectomy (group A) was performed in 79.8% of the cases and pleural abrasion without pleurectomy (group B) was performed in 20.2% of the cases. The surgical outcomes were checked by reviewing medical records until December 2014.

Results: The overall morbidity rate observed was 16.7%, median length of stay was 5.0 days and recurrence rate was 7.7%. There was no statistically significant differences in the variables complications, length of stay and recurrence between the two groups.

Conclusions: In our study, pleurectomy revealed not to improve the surgery outcomes, therefore surgery for primary spontaneous pneumothorax can be performed using pleural abrasion without pleurectomy, not compromising the outcomes.

Key words: *Surgery. Pneumothorax.*