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CO 001. PARANEOPLASTIC SYNDROME IN LUNG CANCER: TWO RARE FINDINGS IN THE SAME PATIENT

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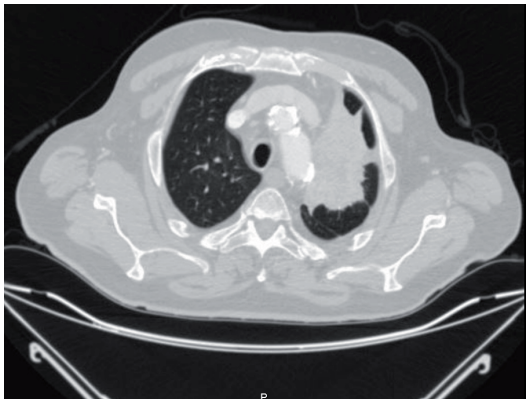
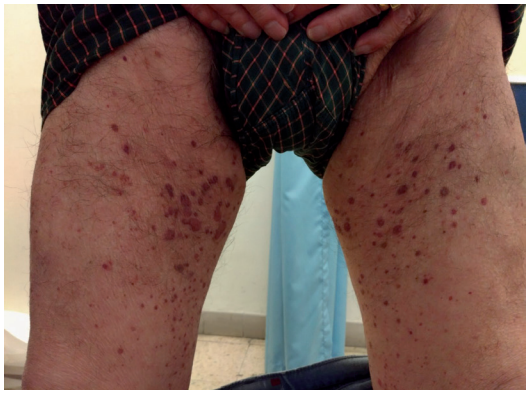
Introduction: IgA Vasculitis (IgAV), formerly called Henoch-Schönlein purpura, is a systemic vasculitis with immunoglobulins A complex deposition involving the small vessels. It is rare in adults and sometimes can be related to the existence of a solid malignancy, mainly from the lung. Although this association has been rarely described evidence suggests that there is a direct relationship between these two pathologies. Also the Nonbacterial Thrombotic Endocarditis (NBTE) is a rare condition, most commonly seen in advanced malignancy or only in autopsy. We present a rare case of a complex paraneoplastic syndrome of squamous cell carcinoma of the lung with the involvement of IgAV and NBTE.
Case report: A 78-year-old man, Caucasian, with a known history of laryngeal malignancy with laryngectomy 20 years ago and tracheostomy since then, acute myocardial infarction with angioplasty of the left anterior descending artery, paroxysmal auricular fibrillation, hypertension and chronic kidney disease stage III. Presents to emergency room with purpura of 2 weeks duration involving the internal area of his ties and lower limbs, which didn't disappear when pression was applied and also with pain in the right tibiotarsal joint. Laboratorial findings of thrombocytopenia, creatinine 1.89 mg/dL and clearance 33 mL/min. He changed dabigatran to edoxaban one month before because of low clearance. The appearance of a reaction to this new anticoagulant motivated the switch to apixaban. The symptoms' persistence motivated a dermatology consultation where the existence possibility of leucocytoclastic vasculitis with probable nephropathy to IgA was put, considering the renal function worsening, the microscopic haematuria and the proteinuria. The laboratory data showed important IgA levels increase motivating hospitalization in the nephrology department. He was submitted to a renal biopsy that revealed a proliferative endocapillary glomerulonephritis related to an IgA vasculitis and to transoesophageal echocardiography that showed an aortic valve vegetation with 9.3 × 3.6 mm. Blood cultures were negative. Because of the presence of several bilateral nodular detected by thoracic radiograph, a thoraco-abdominopelvic CT was performed revealing extensive tumour in the pulmonary left superior lobe with pleural invasion, bronchovascular compression and several bilateral nodules. The histological findings of the bronchial fibroscopy were com-





patible with squamous cell carcinoma of the lung. During the hospitalization period he was medicated with prednisolone and azathioprine, with only partial regression of cutaneous lesions. The follow-up was made by the pulmonary oncology consultation where the diagnostic of squamous cell carcinoma in stage IV was established, without signs of metastasis on brain CT, being now medicated with oral vinorelbine.
Discussion: The evaluation for solid organ malignancies, especially in the lung, should be consider in adult patients that develop IgAV without an identifiable cause. Other published data (although rare), the synchronous diagnosis in time and the uncomplete remission of the purpura, despite correct therapeutic, suggest a strong link in this association. The precise relationship between IgAV and solid malignancy is still not entirely clear. Also the NBTE contributes to increase the complexity of the described paraneoplastic syndrome. We pretend to reinforce the importance of evaluation for malignancies in similar situations.

Key words: *Cancer. Lung. Vasculitis. Paraneoplastic. Endocarditis.*

CO 002. HYPONATREMIA AS PRESENTING SIGN OF LUNG CANCER: A CASE REPORT

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Introduction: Hyponatremia (Na^+ less than 135 mEq/L) is a common disorder in the hospitalized patient. Its clinical presentation is variable, from nonspecific symptoms like nausea, vomiting and headache to severe neurological signs, but most of the time it is asymptomatic. SIADH (syndrome of inappropriate antidiuretic hormone secretion) is one of the most frequent causes of hyponatremia, and may be related to drugs, infections, central nervous system disorders or cancer diseases.
Case report: We report a case of a 65-year-old woman who presented at the emergency department due to symptoms of discomfort, nausea and vomiting. Examination was normal. Lab results shown Na^+ value of 112 mmol/L. Chest X-ray revealed left hilar lung mass. Her medical conditions at the time was hypertension, chronic pain syndrome due to osteoarticular disease and current smoking, and she was taking indapamide, ramipril, flupirtine, gabapentin, tramadol and paracetamol. The patient was admitted to the Internal Medicine ward and started correction of hyponatremia. Likely diagnosis were SIADH by drug-induced iatrogenesis or related to lung cancer. Thoracic CT scan showed 85mm mass in left upper lobe of the lung, with involvement of ipsilateral mediastinal vessels; thickening of the peribronchovascular interstitium suggesting carcinomatous lymphangitis; parenchymal nodules in the same lobe suggesting hematogenous dissemination; ipsilateral pleural effusion 3 cm; and mediastinal adenopathy. NSE (Neuron-Specific Enolase) was elevated (215 ng/mL), while other tumor markers were normal. Flexible bronchofibroscopy revealed a partially occlusive hyperemic mass of the upper left lobar bronchus. Cytological examination of the bronchial brush and bronchial secretions were negative. We could not perform biopsies due to intense cough. We assumed the diagnosis of inoperable lung cancer, stage IVA, without histological characterization. Due to worsening of her general condition, with asthenia and weight loss inducing ECOG performance status 3, it was considered the patient was not eligible for chemotherapy so she initiated palliative support therapy.
Discussion: Hyponatremia is a recognized prognosis factor in cancer disease and has also been associated to a higher risk of being diagnosed with cancer, mostly lung and head and neck cancers. Among the causes of hyponatremia, SIADH has a leading role. Despite the known association between SIADH and lung cancer, especially small cell carcinoma, hyponatremia as initial presentation of paraneoplastic SIADH is uncommon. This clinical case recalled us to the importance of a holistic approach of the patient, attending to all pathologies and risk factors. In case of SIADH and hyponatremia, we should not take into account only the most obvious etiologies, instead we must always consider other possible causes, namely neoplastic, regardless of the evolution time, and mainly if there are any risk factor. In this report, the patient was taking drugs strongly associated with hyponatremia, which could easily make us think the etiology was that. However, the absence of analytical improvement and the existence of other risk factors (as smoking) drove us to a much more catastrophic diagnosis, such as lung cancer.

Key words: *Lung cancer. Hyponatremia. SIADH. Smoking.*

CO 003. LUNG CANCER AT HOSPITAL BEATRIZ ÂNGELO: 6 YEARS AFTER

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Hospital Beatriz Ângelo.

Introduction: Lung cancer (LC) continues to be the first cause of cancer mortality around the world. Estimates of its incidence in Portugal point to 39,2 new cases/100 000 habitants. Considering the importance of the disease we intended to characterize the population followed in consult of pneumoncology at a district Portuguese Hospital.
Methods: The patients followed in consult of pneumoncology at Hospital Beatriz Ângelo between May 2012 and January 2018 were retrospectively analyzed. The patients were characterized demographically, by smoking history, comorbidities, performance status (PS), clinical presentation, diagnostic method, histology and biomolecular study, therapeutic approach and outcomes.
Results: We reviewed 458 clinical records of patients with LC. About 75% of patients were men, the mean age was 66.5 ± 10.4, 79% had a smoking history, 38% of those were active smokers. Just 7% had know exposure to asbestos. The most prevalent comorbidities were cardiovascular disease (59%), chronic obstructive pulmonary disease (42%), and a second neoplastic disease 9.2%. The PS was 0-1 in 72% of patients. In terms of inicial clinical presentation 21% had a pneumonia, 17% had consumptive symptoms and 14% had an unspecific imagiologic finding. The diagnostic method most employed was the bronchofibroscopy (47.4%), followed by the transthoracic pulmonary biopsy (19.9%) and the endobronchial ultrasound (8.5%). As for histological subtypes adenocarcinomas were present in 54.5%, squamous cell carcinomas in 24.9% and small cell lung cancer in 9.8% of patients. The clinical staging was based on two TNM classifications. About 56.6% of patients presented in stage IV, and 12.7% in stage I. We identified thirty patients with EGFR mutations, seven with ALK translocation and one with HER2. There was a positive T790M mutation in two patients. About 58% of patients were offered a palliative approach, 33% a curative approach (66% of which had surgery) and 9% an approach based on best supportive care. Of the patients offered a palliative approach 80% had chemotherapy as the initial treatment followed by therapeutic target in 8.3% and immunotherapy in 2.1%. The remaining patients were only subjected to palliative radiotherapy. With an average follow-up of 16.8 months, the global mortality was 69.9%, being progression of the disease (56.9%) the most common cause of death. The median global survival time was 10 months.
Conclusions: The analysis of our population demonstrates a percentage of adenocarcinomas and late stages of disease at presentation consistent with the literature. This late stages at presentation explain the low rates of curative strategies and high associated mortality. Earlier diagnostic strategies are paramount.

Key words: *Lung cancer. Staging. Overall survival.*

CO 004. BRONCHIAL-OESOPHAGEAL FISTULA: A RARE INITIAL PRESENTATION OF PULMONARY ADENOCARCINOMA

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Introduction: Lung cancer presentation is often insidious, producing no symptoms until the disease is well advanced. Although respiratory symptoms predominate, dysphagia was reported in 1-2% of the patients.
Case report: The current case discusses a 72 year-old man, exsmoker (50 pack-years), with type 2 diabetes, arterial hypertension and history of pulmonary tuberculosis when he was 26 years old. He was admitted in the Emergency room with solid dysphagia, asthenia and anorexia for the past two months. Patient performance status was 0, without alterations at physical examination. An endoscopy was performed with observation of esophagus stenosis at 25 cm from the incisor teeth, with regular mucosa. Dilation with an inflatable balloon was performed without complications. Microscopic examination of the endoscopy biopsy showed an unspecific chronic inflammatory process, no malignant cells were observed. The CT scan revealed an esophagus stricture with densification of lipid planes near the lesion and contact with a cavitary lung lesion with 18 mm in upper right lobe. The bronchoscopy had no alterations of bronchial tree and the direct exam and mycobacteriology of sputum and bronchoalveolar lavage were negative. Two months after he was readmitted in Intensive Care Unit with the diagnosis of cavitary pneumonia in the right upper lobe of the lung and acute respiratory failure that needed mechanical ventilation. Thorax CT showed an extensive pulmonary consolidation involving the right lung. The upper endoscopy showed purulent secretions in the proximal esophagus. Distal to the stenosis, it was observed an extensive cavity with necrotic material and secretions, without visualization of distal esophagus. The endoscopy biopsy showed invasion of esophagus by an adenocarcinoma of the lung. The patient was submitted to esophagus exclusion and in a second procedure to a right upper lobectomy, lung segmentectomy and esophagectomy. The histopathology exam showed a bronchial-oesophageal fistula provoked for an acinar adenocarcinoma of the lung. The patient died after the second procedure with the diagnosis of refractory septic shock.
Discussion: This case highlights an atypical presentation of pulmonary adenocarcinoma in a patient in which the only symptom was solid dysphagia. It also highlights a rare etiology of malignant bronchial-oesophageal fistula.

Key words: *Bronchial-oesophageal fistula. Pulmonary adenocarcinoma.*

CO 005. MEDIASTINAL MASS - A RARE CAUSE

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Introduction: Sclerosing mediastinitis is a rare and serious condition that manifests in young patients characterized by an extensive fibrotic reaction that involves the mediastinum and may mimic a neoplasia. Generally, the etiology is uncertain or idiopathic but the main causes are histoplasmosis and tuberculosis.
Case report: This case relates to a 34-year-old man, Brazilian, who was a sporadic smoker and an employee at an airport baggage terminal, with exposure to dust and fuel fumes, with no known personal background. He went to the hospital due to a sudden onset of cough with live-blood hemoptysies, with no other associated complaints. After clinical and radiological evaluation, which included a CT scan of the chest showing a densification of the pulmonary parenchyma in the right lower lobe, involving the apical and posterior basal segment of the peribronchial location, translating changes of infectious/inflammatory nature, the patient was discharged with the diagnosis of community acquired pneumonia medicated with Amoxicillin/clavulanic acid and azithromycin. He returned to the hospital 2 days later, with recurrence of hemoptysis, associated with a decrease of 2 grams of hemoglobin. A thorax angio CT was performed and that showed a mediastinal mass of 7 cm in the right main bronchus with infiltrative characteristics, 2 subcarinal adenopathies and a discreet right pleural effusion. In this context, a bronchofibroscopy was performed, in which an exuberant clot was removed from of the right bronchus, with conditioned atelectasis of the middle lobe and lower lobe, and a thoracentesis was performed with an exit of 660 cc of exudative fluid. No organism was isolated in the bronchial secretions, in the bronchoalveolar lavage, in the pleural fluid, and it was observed in the aspiration of the transbronchial a mass ofa predominance of lymphocytes, without neoplastic cells. After 7 days of antibiotic therapy and due to clinical and hemodynamic stability, the patient was discharged staying with an outpatient follow-up. In the context of the investigation, and because the neoplasia was still a hypothesis, thoracic surgery was performed with lung biopsy of the right upper lobe and a biopsy of the mediastinal mass. The anatomopathological examination finally revealed the diagnosis of sclerosing mediastinitis. Serologies for syphilis and histoplasmosis were negative and tuberculosis was excluded. At the end of 6 months, and only with symptomatic treatment, the patient is stable and asymptomatic.
Discussion: The pathophysiology of sclerosing mediastinitis is still controversial. It is believed that there is a pulmonary infection associated with mediastinal and hilar adenomegalies, which can, after an inflammatory process, heal and calcify. The difficult diagnosis, most of the times, leads to the patient undergoing a surgical biopsy. In this case, I underline the need to be attentive to the various differential diagnoses of the mediastinal masses, especially after several unsuccessful attempts at a diagnosis.

Key words: *Sclerosing mediastinitis. Fibrosis. Mediastinal mass. Hemoptysis.*

CO 006. "SCAR CANCER" - A CLASSIC ASSOCIATION BETWEEN TUBERCULOSIS AND LUNG CANCER THAT SHOULDN'T BE FORGOTTEN

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Introduction: The simultaneous or sequential occurrence of pulmonary tuberculosis (PT) and lung cancer in the same patient is known. The cancer can occur in the territory of tuberculosis and reactivate an old focus; carcinoma can develop by metaplasia of the epithelium of tuberculosis cavitations; the two diseases may be independent and occur simultaneously or sequentially; metastases of carcinoma may arise in a lesion of old tuberculosis or tuberculosis infection secondary to carcinoma-related immunodepression or its treatment. The development of a carcinoma from a tuberculosis scar is also another possibility.
Case report: We describe the case of a 73-year-old woman with history of PT in youth, chronic obstructive pulmonary disease/pulmonary emphysema with severe airflow obstruction, essential hypertension and previous smoking (100 number of pack years). Accompanied in consultation of Pulmonology since 2012. She had an initial CT (computed tomography) of chest with marked centrilobular emphysema and a small round calcification in the upper right upper lobe of PT. These imaging aspects remained stable until early 2017. Because of recurrent respiratory infections during the year of 2017 and due to gasimetric and clinical worsening with decreased tolerance to efforts, complementary diagnostic tests were requested, including chest CT reassessment. It revealed a solid peripheral nodule in anterior segment of right upper lobe with 7 × 5

mm, spiculated contours and with a small round peripheral calcification (previously reported). In positron emission tomography the nodule was suspicious of having malignant etiology. He underwent bronchofibroscopy with cytology compatible with lung adenocarcinoma. PT causes changes in the bronchial and alveolar mucosa that may contribute to carcinogenesis. The inflammatory process induces genetic damage and neoplastic transformation. The lung scar cancer can be confused as an old lesion, delaying the treatment initiation. It is extremely important to compare lesions with previous CT scans. Most of the lesions are less than 3 cm, located in the periphery and in the upper lobes.
Discussion: Patients with history of PT are a group of risk for the development of lung cancer. These patients should be continuously monitored and advised to avoid exposure to other carcinogens such as smoking.

Key words: *Tumor. Scar. Tuberculosis. Cancer.*

CO 007.A RARE CAUSE OF HEMOPTYSIS

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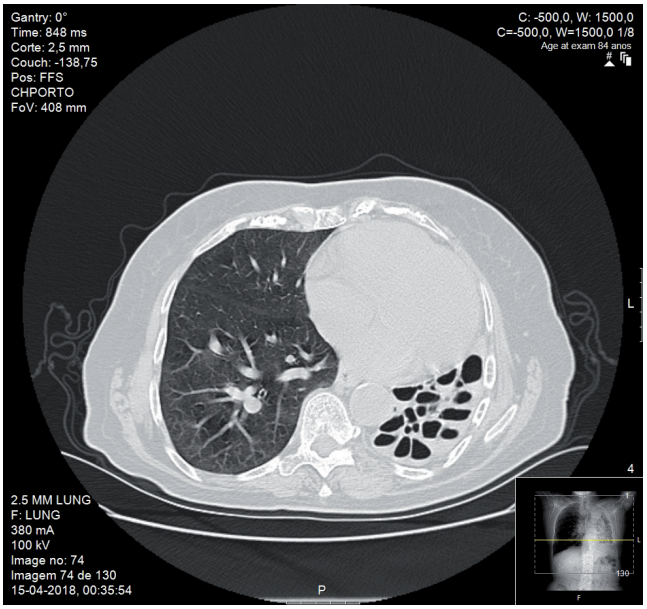
Introduction: Congenital cystic diseases of the lung are rare diseases, with an undetermined etiology. This group of disorders includes: bronchogenic cyst, cystic adenomatoid malformation, pulmonary sequestration, and congenital lobar emphysema. Nowadays, the diagnosis is usually established in the prenatal or neonatal period. In most cases, surgical treatment is indicated, in order to prevent future complications, namely infections and/or malignancies. However, in rare cases, patients remain asymptomatic during most of their lifetime. In these cases, if prenatal screening was not done, the diagnosis might only be established incidentally during adulthood.



Case report: We present the case of an 84-year-old woman with a history of frequent respiratory tract infections, with various previous episodes of hemoptysis during these periods. She was admitted to the emergency department due productive cough and hemoptysis. Pulmonary auscultation revealed diminished breath sounds on the left hemithorax with diffuse crackles. A chest X-ray showed cystic formations in the left lung. For better characterization, a pulmonary computed tomography (CT) scan was performed which revealed marked volume loss of the left lung, which is totally replaced by multiple cystic formations. In the microbiologic study of respiratory secretions there was isolation of *Pseudomonas aeruginosa*. The patient received antibiotic therapy, without recurrence of the hemoptysis.
Discussion: These imaging aspects suggest the diagnosis of congenital cystic adenomatoid malformation, currently congenital pulmonary airway malformation.
This case is an example of a atypical clinical evolution of a rare disease.

Key words: *Congenital cystic diseases. Hemoptysis.*

CO 008. PULMONARY LEIOMYOMATOSIS: A RARE DISEASE IN THE DIFFERENTIAL DIAGNOSIS OF PULMONARY NODULES

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Introduction: Benign metastatic leiomyomatosis is a rare condition and the lung is the most frequently affected organ. It is usually diagnosed in women with previous history of uterine leiomyomas and hysterectomy and it is frequently asymptomatic. Diagnosis is often made during the investigation of pulmonary nodules. Nonetheless, when pulmonary disease is of central location, patients can present with dyspnea, cough, hemoptysis, atelectasis or obstructive pneumonitis. Treatment usually relies on hormonal and, if possible, surgical therapy and the prognosis is good.
Case report: We present the case of a 47 year-old woman, with smoking habits (10 PY) which had been under hysterectomy for uterine leiomyomas 18 years before, when she was 29 years old. She was diagnosed with right inguinal hernia with surgical indication, after presenting with right inguinal mass and pain, with no other symptoms or positive findings on physical examination, with ECOG performance status of 0. When undergoing pre-operative exams in February 2017, chest X ray showed two nodular opacities, which led to a chest CT scan that demonstrated one 28 mm pulmonary nodule on the right inferior lobe, one 8 mm nodule on the left inferior lobe, one 5 mm micronodule on the left inferior lobe e a few other milimetric findings bilaterally. Patient underwent thoracic biopsy of the right inferior lobe pulmonary nodule and the histopathological result of the referred lesion revealed positivity for smooth muscle actin on immunohistochemistry, with over 70% of cells overexpressing estrogen receptors, which favors the diagnosis of leiomyoma. Histopathology blocks referring to the hysterectomy that had happened years before were reviewed and they came to the conclusion that it contained proliferative endometrium as well as two nodules suggestive of leiomyomas and cellular count increase, with no findings regarding necrosis or cellular atypia, favoring the diagnosis of mitotically active leiomyoma. Due to the existence of countless pulmonary nodules bilaterally, surgery was not indicated. Because of overexpression of estrogen receptors, the patient underwent medical hormonal therapy with gonadotropin-releasing hormone analogue. After ten months of treatment, patient is asymptomatic and disease is considered stable.
Discussion: Usually, these patients present asymptomatically, and time from initial hysterectomy to the diagnosis of pulmonary leiomyomatosis can be as long as 25 years. Similarly to what is described in the literature, this patient presented with pulmonary nodules on chest X ray 18 years after hysterectomy. Diagnosis of pulmonary leiomyomatosis was confirmed by comparison of histopathological blocks with the uterine leiomyoma previously diagnosed. This case highlights the importance of careful and complete clinical history when dealing with and asymptomatic or oligosymptomatic patient and emphasizes the value of considering extra pulmonary disease when approaching pulmonary nodules.

Key words: *Pulmonary nodules. Oncology. Differential diagnosis.*

CO 009. ULTRASOUND SCREENING OF POST-TRANSBRONCHIAL CRIOBIOPSY PNEUMOTHORAX

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Introduction: Pulmonary transbronchial criobiopsy has played a central role in the diagnostic approach to diffuse pulmonary diseases. The most frequent complication is pneumothorax, which is routinely screened for with chest X-ray (CXR) 2 hours after the procedure. Thoracic ultrasound (TUS) has been shown to have a diagnostic power superior to CXR in the diagnosis of pneumothorax in previous series.
Objectives: This study aimed to evaluate the diagnostic accuracy of TUS and agreement with CXR in the diagnosis of pneumothorax after pulmonary criobiopsy.
Methods: Patients who underwent pulmonary criobiopsy were submitted to TUS within 30 minutes and TUS and CXR at 2 hours after the procedure. Ultrasound and CXR evaluations were independent. There have been 33 evaluations to date.
Results: Patients submitted to the protocol had a median age of 61 years (44-80 years), with 54.5% (n = 18) males. The majority (n = 22, 66.7%) had biopsy performed in only 1 lobe and predominantly in the right lung (n = 16). The agreement between the TUS and CXR evaluation was 0.94 ($p < 0.01$). Of the pneumothorax diagnosed by TUS (n = 14), most were detected at the 30 minute evaluation (n = 10, 71.4%) with 4 being immediately subjected to chest tube drainage. Detection of pneumothorax by TUS had a sensitivity and specificity of 93.3% and 100%, respectively. RXT achieved a sensitivity and specificity of 86.7% and 100%, respectively. There was 1 pneumothorax that was only detected after the 2 hours in protocol. There was a need for thoracic drainage in 6 cases (18.2%).
Conclusions: Because of its accessibility (patient's bedside), harmlessness (without radiation) and low cost, ET to detect pneumothorax may become common practice. Despite the small sample size, the results show that ET may replace RXT in the evaluation of iatrogenic pneumothorax.

***Key words**: Thoracic ultrasound. Pneumothorax. Criobiopsy.*

CO 010. THE IMPORTANCE OF INTRAPLEURAL FIBRINOLYTICS IN THE MANAGEMENT OF COMPLICATED PLEURAL EFFUSIONS

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Hospital Prof. Doutor Fernando Fonseca.

Introduction: Empyema and parapneumonic effusion are relatively common complications of bacterial pneumonia accounting for a mortality rate in the order of 10-20%. Despite the correct initial approach (placement of thoracic drainage and broad-spectrum antibiotic therapy), 1/3 of the cases require surgical approach. Intrapleural instillation of fibrinolytics has been shown to reduce the need for surgical intervention as well as length of hospital stay.
Objectives: Analysis of cases of parapneumonic pleural effusion and empyema that required the instillation of intrapleural fibrinolytics occurred in Hospital Prof. Doctor Fernando Fonseca from January 2014 to May 2018, in particular, regarding antibiotics used, evidence of loculation CT, pH and pleural fluid mascroscopic appearance, imagiologic improvement after fibrinolytics, side effects after instillation of the same, mean time of hospitalization, need for thoracoscopy and deaths.
Methods: Retrospective study of the clinical processes of patients with parapneumonic pleural effusion or empyema requiring instillation of intrapleural fibrinolytics (Alteplase 10 mg + DNAse 5 mg, following a protocol of administration every 12 hours for 3 days in a total of 6 administrations or less, if unwanted side effects) hospitalized at the Hospital Prof. Doctor Fernando Fonseca from January 2014 to May 2018. Statistical analysis was performed with Microsoft Excel 2013®.
Results: The total number of cases in the period from January 2014 to May 2018 was 12, being 10 (16.7%) male. The mean age of patients was 53.3 years (minimum age: 41; maximum age: 71). 7 (58.3%) were active smokers, 1 former smoker and the remaining non-smokers. One patient had HIV, two patients a history of alcohol abuse and two had pulmonary tuberculosis sequelae. The most used antibiotics were the combination of piperacillin/tazobactam + clindamycin (n = 7; 58.3%), ceftriaxone + clindamycin (n = 3; 25%) and meropenem (n = 3; 25%). Regarding the characteristics of the effusion, CT showed evidence of loculation in all cases analyzed (n = 12), and the average pH of pleural fluid was 6.8. The macroscopic aspect of the pleural fluid was purulent in 33.3% (n = 4) of the cases, sero-fibrinous in 50% (n = 6) and serohematic in the remaining (n = 2, 16.7%). The mean number of administrations of fibrinolytics per patient was 3.7, partly due to the resulting side effects, namely evidence of hematic fluid (n = 9; 75%), pain (n = 7, 58.3%), and fever (n = 4, 33.3%). There was evidence of frank imagiologic improvement after administration of fibrinolytics in 10 (83.3%) of the cases, and only 2 patients (16.7%) required thoracoscopic intervention with decortication. The mean length of hospital stay was 18.8 days. There were no deaths.
Conclusions: Despite the small size of the sample, the instillation of intrapleural fibrinolytics appears to be a valid, safe and important therapy in the approach of complicated pleural effusions that do not have a favorable evolution under antibiotics and thoracic drainage. In fact, as we can see, the instillation of fibrinolytics led to imagiologic improvement in most cases, causing only two patients to undergo thoracoscopy.

***Key words**: Empyema. Parapneumonic effusion. Intrapleural fibrinolytics. Thoracoscopy.*

CO 011. PRIMARY SPONTANEOUS PNEUMOTHORAX AND MEDICAL THORACOSCOPY: EXPERIENCE VS. GUIDELINES

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Introduction: Primary spontaneous pneumothorax affects mostly young male adults, presenting a significant recurrence rate: between 17% and 54%. According to literature, initial approach in the first episode is the intercostal tube drainage. Pleurodesis is nowadays the recommended procedure when drainage treatment fails or in recurrent cases. Nevertheless, guidelines do not specify which is the best pleurodesis approach or the chemical agent to use. Pleurodesis performed by medical thoracoscopy is a simple and minimally invasive procedure.
Objectives: The aim of this study is to present the experience of a pulmonology department regarding the use of medical thoracoscopy in the management of primary spontaneous pneumothorax.
Methods: Medical thoracoscopy is executed under general anaesthesia using two trocars (5 and 7 mm). This is a rectrospective cohort study including the individuals that performed chemical pleurodesis by medical thoracoscopy due to primary spontaneous pneumothorax in the period between September 2016 and July 2018. During this period, 57 medical thoracoscopy procedures were done. From the total 58, 14 procedures (13 patients) were intended to treat primary spontaneous pneumothorax, using chemical pleurodesis with *steritalc*. The mean age of patients was 24.21 years ($\sigma = 5.05$) with median age of 23.50 years, 100% males. All procedures had no immediate complications. 7 were recurrent cases. The remain 7 were first episodes: 3 with persisting air leak

for more than 3 days of drainage, 3 were sportsmen and the other was a commercial airline pilot. Until now only one of these patients presented recurrence, however it was contralateral.
Conclusions: Nowadays literature recommends intercostal tube drainage as first line treatment for the first episode of primary spontaneous pneumothorax. Pleurodesis is used for the management of complications: recurrent cases, persisting air leak for more than 3-5 days, haemopneumothorax and bilateral pneumothorax. Pleurodesis achieved by medical thoracoscopy is a safe procedure, showing good results on a long-term basis, presenting a recurrence rate of 5% approximately. Future research is required about high risk population subgroups, which may have a higher risk of recurrence and also find out which cases should be treated with pleurodesis in the first episode. Medical thoracoscopy may play a relevant role in the definitive treatment of these patients.

Key words: *Pneumothorax. Thoracoscopy. Pleurodesis. Talc.*

CO 012. MALIGNANT PLEURAL EFFUSION APPROACHED BY MEDICAL THORACOSCOPY AND TALC *POUDRAGE* EFFECTIVENESS STUDY

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Introduction: Medical thoracoscopy (MT) is a universal technique used for investigation of pleural effusions of undetermined etiology. In suspicion malignant pleural effusions, MT is indicated for diagnosis and therapeutic accomplishment of talc pleurodesis to avoid pleural effusion recurrence. The possible impact of pH value and pleurodesis effectiveness has been a conflicting point in the literature with some studies showing a less successful pleurodesis in malignant pleural effusions with acidotic pH, probably reflecting a more diffuse pleural infiltration.
Methods: Characterization of all malignant pleural effusions approached by MT in the last 8 years. Evaluation of pleurodesis effectiveness based on a 30-day recurrence and correlation study between talc *poudrage* efficacy and pleural fluid pH.
Results: Of all 140 patients approached by MT, 61 patients presented malignant pleural effusions. Their mean age was 69.8 years and the prevalence was higher in females than males (52.5% *versus* 47.5%). In the initial approach 83.6% were observed as free pleural effusions. Mean pleural fluid pH was 7.44. There was a clear mononuclear prevalence with a mean 81.4% lymphocyte predominance. At thoracoscopical evaluation 85.2% of cases had nodulation/implants. The most common histological diagnosis obtained was metastatic lung cancer in 59.0% followed by metastatic breast cancer in 16.4% and mesothelioma in 13.1%. Pleurodesis by talc *poudrage* was performed in 55.7% (n = 34) of the patients. In those that had radiological control at 30 days, 81.8% didn't have recurrence of pleural effusion. There was recurrence in 18.2% of patients. In 20.6% of the patients that underwent pleurodesis there wasn´t radiological control at 30 days and 14.7% of patients died before radiological control at 30 days. Of all patients, only 8.2% presented with acidotic pleural fluid (pH < 7.2). No recurrent pleural effusions was seen in this cases after. The mean fluid pH of patients without recurrence of pleural effusion was 7.41 *versus* 7.36 in the failed pleurodesis subgroup, respectively. This difference was statistically significant (p = 0.04).
Conclusions: Performing pleurodesis in a timely manner by a high efficacy modality in malignant pleural effusions is of paramount importance to a well succeed palliation of dyspnea in these patients. Thoracoscopy, besides having a high diagnostic yield can enable this simultaneous therapeutic intervention. In the present study we concluded for an overall effectiveness of pleurodesis by talc *poudrage* of 81.8%, after 30 days. This study also concluded that the pleural fluid pH value can influence the pleurodesis effectiveness. The subgroup of patients without effectiveness of pleurodesis, presented with a lower mean pH. Despite the reduced number of patients with acidotic pleural fluid that underwent pleurodesis, no recurrences were documented.

Key words: *Malignant pleural effusion. Medical thoracoscopy. Pleurodesis.*

CO 013. THE EFFICACY OF PLEURODESIS IN MALIGNANT PLEURAL EFFUSION

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Introduction: Malignant pleural effusion often has a very relevant negative impact on the quality of life of the patient with cancer. In most cases it has little response to treatment of the underlying neoplastic disease and pleurodesis may be an asset in the symptomatic control and palliation of these patients.
Objectives: To describe the results of chemical pleurodesis by talc *slurry* (QP) performed in recurrent malignant pleural effusion (MPE) and to test the association between its success and the degree of pulmonary expansion and the amount of pleural fluid (PF) previously drained.
Methods: Review of the clinical processes of patients with MPE undergoing QP trough thoracic chest drain (TD) in the period of 2014-2017. Patients with primary pleural neoplasms were excluded. Fisher's exact test was used to test the association between pleural effusion recurrence and 1) the absence of complete lung expansion on chest radiography and 2) the presence of daily PF rates of more than 150 ml. The success of pleurodesis was defined as the absence of relapse of the MPE or the absence of symptoms related to it.
Results: We selected 31 patients with the diagnosis of MPE undergoing QP in the period mentioned. The mean age was 68 years and 64.5% (n = 20) were females; 41.9% (n = 13) had previous or current history of smoking. At the time of TD placement the majority of patients (74.2%, n = 23) had performance status (PS) of 1, 19.4% (n = 6) had PS 2 and 6.5% (n = 2) had PS 3. In 41.9% (n = 13) of the cases pleural effusion was present at the time of diagnosis, whereas in the remainder it represented a progression of already known neoplastic disease. As for tumor histology, 48.4% were lung primary (13 adenocarcinomas, 1 small cell carcinoma and 1 squamous cell carcinoma), 22.6% (n = 7) of the breast, 6.5% (n = 2) of the ovary and 6.5% (n = 2) corresponded to gastric neoplasms. There was a recurrence of MPE in 32.2% of the cases (n = 10), which corresponded to a pleurodesis success of 74.2% (n = 23). In more than half of the patients (54.8%, n = 17) pleurodesis was performed despite consistently maintaining daily rates of PF > 150 ml. However, the statistical analysis of the data revealed that this factor was independent of the relapse of the MPE. In 8 patients (25.8%), pleurodesis was performed despite of only partial pulmonary expansion on chest radiography. Recurrence of MPE was observed in 3 of these patients and there was no statistically association between absence of complete lung expansion and recurrence of MPE. In patients with relapse of MPE, this occurred on average 222 days after QP (minimum 23, maximum 653). Only 1 patient had a complication of the procedure (empyema post pleurodesis).
Conclusions: Notwithstanding international recommendations, it is not always possible to meet the ideal conditions for pleurodesis. The results of this retrospective analysis show that even in these particular situations that could predict the failure of pleurodesis, it can maintain its efficacy, to the benefit of the patient.

Key words: *Pleurodesis. Malignant pleural effusion.*

CO 014. MANAGEMENT OF MALIGNANT PLEURAL EFFUSION: WITH OR WITHOUT ULTRASOUND?

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Introduction: The use of thoracic ultrasound (US) to mark the site of thoracocentesis (TC) and pleural biopsy (PB) is performed to reduce de incidence of complicated procedures.
Objectives: To evaluate de contribution of ultrasound (US) marking of thoracocentesis (TC) and pleural biopsy (PB) site for the reduction of complicated procedures and increase in the diagnostic rates of malignant pleural effusions.
Methods: Retrospective unicenter study that includes all patients diagnosed with malignant pleural effusion and that were submitted to TC and PB together from January 2015 to December 2017. Ramel needle was used for the biopsies. Data related to the pathologic diagnosis, as well as, technical aspects and complications associated with the procedures were collected. Two groups were compared: those that used US mark and those that did not.
Results: 98 procedures were selected. US site marking was performed in 41 (41.8%). The 6th intercostal space was the most frequent site used. It was chosen in 75.4% (n = 43) of the procedures without US and in 54.7% (n = 22) of the procedures in which US marking was performed. The use of this space was significantly lower in those procedures with US support (p = 0.007). The cytological analysis of the pleural fluid was positive in 64.3% of the cases (n = 63%) and the biopsy was diagnostic in 62.2% (n = 61). The combination of TC with PB increased the diagnostic rate to 82.7% (n = 81). In the other 17.3% cases, the malignant etiology was defined after a new TC and PB or after thoracoscopy. The use of US was not associated with a significant increase in the diagnostic rate when considering only TC (63.4% *versus* 64.9%; p = 0.879), only PB (68.3% *versus* 57.9%; p = 0.295) or using both (87.5% *versus* 78.9%; *p* = 0.253). The following diagnoses were observed: 14 (14.3%) cases of mesothelioma, 52 (53.1%) cases of secondary pleural involvement after lung cancer and 32 (32.7%) cases of pleural involvement after cancers from other origins. Complications were observed after 7 procedures (7.1%). Pneumothorax was the most frequent one with 6 (6.1%) cases [5 requiring drainage (5.2%)], followed by significant local hemorrhage (n = 1). In the US group, complications were present after 2 procedures (2.1%) and they were all pneumothorax.
Conclusions: Similarly to what is seen in the literature, the use of US to mark the site of TC and PB was not associated with a significant reduction in the number of complicated procedures. Moreover, It also did not significantly increase the diagnostic rates. However, is important to highlight that the use of ultrasound is well established and is advisable, since it allows choosing the safest site and reduces the number of unnecessary procedures.

***Key words**: Ultrasound. Thoracocentesis. Pleural biopsy. Malignant pleural effusion.*

CO 015. CASUISTIC REVIEW OF TRACHEAL STENOSES AFTER INTUBATION IN AN INTERVENTION BRONCHOLOGY UNIT

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Introduction: Tracheal stenosis is the most frequent cause of post-intubation and post-tracheostomy lesions. The most recent prospective studies show an incidence of tracheal stenosis after intubation of 10% to 19%, with significant stenosis occuring in 1% of patients. Faced with a patient that has a history of tracheal intubation with symptoms of airway obstruction, the hypothesis of tracheal stenosis should be investigated. Bronchoscopy is the diagnostic method selected. Among the endoscopic procedures there are: mechanical dilatation, electrocauterization, laser photoresurgy, argon plasma coagulation and prosthesis placement at the area of the lesion.
Methods: All patients with post-intubation tracheal stenosis who underwent rigid and flexible bronchoscopy for this reason between 01/01/2013 and 05/31/2018 were reviewed. The treatment and its results were analyzed.
Results: Twenty-two patients were included. The mean age was 59 years. 61% were female. The most frequent location was the upper third of the trachea (82%). Twelve patients had simple stenosis and ten had complex stenosis. The median severity of obstruction was 50% while the median was 42%. The mean number of procedures performed per patient was 6.2 and the average follow up time was 32 months. From the twenty-two patients undergoing bronchoscopy, one patient was only observed. One patient was treated only with mechanical dilatation. Four patients were treated with mechanical dilatation and laser photocoagulation. The tracheal prosthesis was placed in sixteen patients. Nine out of these sixteen patients were only treated with mechanical dilatation while in seven patients, besides mechanical dilation, laser photocoagulation was also performed. The mean of mechanical dilation required was 2.14 and the median was 2 mechanical dilation. The most common complications were the occurrence of granulomas (8 patients) and migration of the prosthesis (3 patients). The tracheal prosthesis was removed in six patients. From these, none recurred until the date of data collection.
Conclusions: The number of patients with tracheal stenosis after intubation has been increasing. Patients with respiratory symptoms such as stridor and with history of tracheal intubation are mandatory for bronchoscopy. Endoscopic treatment options allow immediate effect with relief of symptoms. Rigid bronchoscopy with mechanical dilation of the tracheal stenosis associated with the laser can often be curative. However, repeat bronchoscopic interventions are required, and more than one procedure was required in most patients to treat tracheal stenoses. In less than half of the patients the tracheal prosthesis was removed.

***Key words**: Benign tracheal stenosis. Post-intubation stenosis. Bronchoscopy. Tracheal prosthesis. Mechanical dilation. Laser.*

CO 016. COMPLEMENTARY STUDY OF "HEMOPTYSIS" - CASUISTRY OF 10 YEARS!

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Introduction: In the investigation of hemoptysis it is common practice to perform high resolution computed tomography (HRCT) and -. However, it is still controversial whether bronchofibroscopy provides additional diagnostic information useful when a patient has a normal HRCT.
Objectives: To determine the performance of bronchofibroscopy in diagnostic information additional to HRCT in patients with "hemoptysis". Inquire about the endoscopic findings in patients with normal HRCT with reference to "hemoptyses".
Methods: A prospective, historical study was carried out to collect the Access® database of reports from the Bronchology sector of a single hospital for a period of 10 years, characterizing socio-demographic, clinical, imaging and endoscopic findings. Inclusion criteria were the indication for bronchofibroscopy of "hemoptysis" in patients with previous HRCT. Three groups were defined based on HRCT findings: Group I. Changes without clear evidence of malignancy; Group II. Suspected changes of neoplasia; Group III. Normal.
Results: Bronchofibroscopy was performed in 269 patients to investigate hemoptysis, with a mean age of 67.64 (± 14.46) years, 66.9% (n = 180) males, 31.6% (n = 85) with a history of smoking. 49.8% (n

= 134) of the patients had previous HRCT and were included in the study, which were subdivided: Group I. 72 patients with HRCT with changes without clear evidence of malignancy (53.7%); Group II. 44 patient with a HRCT with suspected changes of neoplasia (32.8%); Group III. 18 patients with normal HRCT (13.4%). Our sample consists mainly of men with a mean age of 68.55 (± 14.27) years, with a history related to tobacco of 37.3% (n = 40). No patient with normal HRCT had changes in bronchofibroscopy presenting this technique with a good performance (negative predictive value of 100% in our sample). Six patients (8.3%) of group I presented endoscopic alterations and were diagnosed with neoplasia. Eight patients (6.1%) presented alterations in the upper airway, namely bleeding, and no signs of endobronchial neoplasia were found. Only about 50% of patients had HRCT at the time of endoscopic examination, which limited the inclusion of a larger number of patients.
Conclusions: Bronchofibroscopy remains an important weapon in the investigation of hemoptysis in patients with HRCT changes. Upper airway abnormalities were also observed in patients with "hemoptysis", with the ORL exam presenting a role in the previous observation of these patients. Modern CT technology combined with the report of experienced and specialized radiologist hypothesize that a normal examination may be sufficient to dispense bronchofibroscopy, however further studies should be conducted to reach this conclusion.

Key words: *Hemoptysis. HRCT. Bronchofibroscopy.*

CO 017. THERAPEUTIC INTERVENTIONAL BRONCHOSCOPY IN INTENSIVE CARE PATIENTS

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Introduction: Interventional bronchoscopy in intensive care unit (ICU) patients, performed at bedside, is very risky and a time-consuming procedure. Careful patient selection and awareness of possible consequences at any moment of the procedure are of paramount importance to achieve optimal results and minimize potential life threatening complications.
Objectives: To identify the main medical conditions possibly requiring interventional therapeutic bronchoscopy in an intensive care setting and to assess its role as an adjunct treatment option.
Methods: Retrospective single-centre study of patients admitted to an ICU, over a 20-year period that needed a therapeutic bronchoscopy for complex situations. Patients needing endoscopic cleaning of secretions or tracheal intubation under bronchoscopy where excluded.
Results: 23 patients were included: 10 bronchoscopies were performed in our ICU, 11 were brought from other ICUs to our bronchoscopy suite and 2 patients required local intervention by our team. Median age was 60 years with male predominance 16/23 (70%). Main indications were: malignant central airway obstruction in 30% (7/23), airway haemorrhage in 26% (6/23), central airway fistula in 26% (6/23), benign central airway obstruction in 13% (3/23) and *in-situ* delivery of antibiotic in 1 case. In 18 cases, the patients were mechanically ventilated. Rigid bronchoscopy was performed in 18 cases and 15 stents were placed. No major complications were observed. Overall success of the procedures was 78% (18/23).
Conclusions: Bronchoscopy in the intensive care setting is challenging and risky, requiring training and planning, but with correct patient selection, equipment and staff, it can be a useful tool in the management of critically ill patients.

Key words: *Bronchoscopy. Intensive care. Mechanical ventilation.*

CO 018. SPECIFIC BACTERIAL IMMUNOTHERAPY - FROM LAB TO OFFICE

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Introduction: Specific bacterial immunotherapy (ITBE) is a relatively recent tool for the prevention of infections. In the respiratory area there has been increasing interest in its application, especially in the prevention of exacerbations of chronic obstructive pulmonary disease (COPD). However, perhaps due to the novelty, relative little experience, cost and personalization of treatment, the data are little abundant.
Objectives: To evaluate efficacy in reducing the number of exacerbations of patients with chronic respiratory disease and frequent infectious exacerbations.
Methods: Prospective study of a convenience sample of patients followed at the Consulta de Readaptação Funcional Respiratória of the Pneumology Service B of the Centro Hospitalar e Universitário de Coimbra, with frequent infectious exacerbations (3 or more) despite the best therapeutic strategies employed. ITBE was used as add-on therapy (not replacing better supportive therapy). Demographic and clinical data were analyzed, namely number of exacerbations 1 year before therapy and 1 year after.
Results: Sample comprised of 11 individuals, 45.5% male, mean age 62.5 years. Eight patients had non-cystic fibrosis bronchiectasis, 2 COPD (1 of them under long-term oxygen therapy) and 1 patient Mounier Kuhn's syndrome. Three patients were or used to be on long-term therapy with azithromycin, 1 patient was under inhaled colistin, and 2 under inhaled tobramycin (the latter colonized with *Pseudomonas aeruginosa*). Out of the 11 patients, only one (patient with bronchiectasis) presented complication (fever), which led to a suspension of therapy at the end of the first month, being excluded from the results. Of the 10 patients who completed the treatment (4.5 or 6 months, according to the manufacturer's recommendation), 4 had bacterial colonization (*Pseudomonas aeruginosa* (4) and/or *Haemophilus influenzae* (1)) and were submitted to a custom vaccine composition with a higher percentage of the colonizing agent (minimum 10% in composition) associated with at least 50% standard composition. The remaining 6 completed the standard composition. The 10 treated patients had an average of infectious exacerbations in the previous year of 3.4 (0.7 with hospitalization). In the year after therapy the mean number was 1.2 exacerbations (0.2 with hospitalization). Three patients reported major clinical improvement with therapy.
Conclusions: Being a highly personalized treatment, comparisons may be impossible and should be made made with caution. The analysis concludes that specific bacterial immunotherapy, in addition to being generally safe, was effective in reducing infectious exacerbations of the patients studied. Even if it is a small sample, it is a starting point for the study of a personalized intervention, with a longer follow-up time.

Key words: *Specific bacterial immunotherapy. Exacerbations.*

CO 019. NONTUBERCULOUS MYCOBACTERIA IN SETÚBAL REGION – REVIEW OF THE LAST 5 YEARS

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Nowadays over a hundred different species of nontuberculous mycobacteria (NTM) are described. The disease caused by these agents depends on the strict interaction between exposure, host and parasite. This data refers to the cases of NTM brought to the Centro de Diagnóstico Pneumológico de Setúbal between 01/01/2013 and 31/12/2017. Twelve patients were included (3 of 2013; 2 of 2015; 1

of 2016; 6 of 2017). Recorded patients that lacked clinical, microbiologic and imagiologic diagnostic criteria were excluded. Out of the 12 patients, the mean age was 60 years old and the standard deviation was 16 years (being the minimum age 35 and maximum 86). Half were male. Most of the patients were referenced from Hospital de São Bernardo (8 from Pneumology outpatient and 2 from the Infectiology nursery). Relatively to the patients immunosuppression profiles, three of them were infected by VIH, two had oncologic diseases (including hematologic) and two of them were under immunosuppressive therapy. Regarding previous respiratory diseases, three of them were diagnosed with chronic obstructive pulmonary disease, two had pulmonary tuberculosis sequelae and three had interstitial lung disease. Concerning the habits, five patients were active smokers or ex-smokers, three had a previous history of alcoholism and three of drug consumption. Clinically, the most frequent symptoms were cough (nine patients), constitutional symptom as asthenia, anorexia or loss of weight (eight patients), fever (three patients) and aggravation of dyspnoea (two patients). All of them presented imagiological findings compatible with the diagnosis. Six of the diagnostics were given by mycobacteriological culture exam of the sputum, five by culture of bronchial lavage sample and one by both of those examinations. The isolated agents were *Mycobacterium avium complex* (eight patients), *Mycobacterium abcessus* (two patients), *Mycobacterium chelonae* (one patient) and *Mycobacterium kansasii* (one patient). The treatment used was preferably an association of rifamicin with etambutol and a macrolid. The mean duration of treatment, calculated for the seven patients that have completed it, was 406 days with a standard deviation of 67 (minimum 365 and maximum 545 days). The remaining five patients are still in therapy. There were no cases of desertion. The side effects that justified a change of drug regime were leucopenia and thrombocytopenia worsening related to rifampicin and neurotoxicity related to etambutol. The low number of patients we describe can probably be explained by the generally indolent manifestations of nontuberculous mycobacteria and because clinical, imagiological and microbiologic diagnostic criteria are needed. Aiming the augment of these diagnostic, it's probably necessary to raise our suspicion, especially in patients with structural lung disease and immunosuppression profiles.

***Key words**: Nontuberculous mycobacteria. Immunosuppression.*

CO 020. INFLUENZA AND PNEUMOCOCCAL VACCINATION – A CROSS-SECTIONAL STUDY WITHIN CHRONIC RESPIRATORY PATIENTS

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Introduction: Chronic respiratory patients are included in the target groups defined by the World Health Organization (WHO) as candidates for influenza vaccination (IV) regardless of age. As for pneumococcal vaccination (PV), the WHO position statement prioritizes high coverage of infants, but the benefits of adult PV are also highlighted. National guidelines tend to adapt these recommendations based on local epidemiological trends and social and financial circumstances. In Portugal, both IV and PV are currently recommended for a large group of chronic respiratory patients (CRP), but only IV is offered free of charge for a limited number CRP and for all inhabitants aged 65 or above (regardless of their medical condition).
Objectives: To ascertain the level of IV and PV coverage and its determinants in real world CRP and to identify the main reasons behind adherence to vaccination.
Methods: We conducted a cross-sectional study of patients admitted to our pulmonary outpatient clinic from October 2017 to mid-February 2018. The study was based on a questionnaire that included patient demographics data, smoking history, educational status, clinical diagnosis and a list of possible hindrances to or reasons for vaccination. A multivariable binary logistic regression model using forward elimination method was used to assess factors associated with IV and PV coverage.
Results: A total of 201 patients answered the questionnaire (59.7% men, 65.3 (SD = 15.3) years, 8% current smokers and 36% former smokers, 81.8% with low educational status). Major diagnosis registered were asthma (31.3%) followed by COPD (28.9%). Coverage for IV and PV was 83.5% and 41.9%, respectively. The logistic regression model revealed IV coverage was independently associated with age ($p < 0.006$): patients aged ≥ 75 or 40-75 years were more likely to have IV coverage than patients aged < 40 years (OR = 9.28; 95%CI, 2.09-41.26; p = 0.003 and OR = 6.98; 95%CI, 1.92-25.35; p = 0.003, respectively); smoking history (p = 0.002): current and former smokers were less likely to have IV coverage than non-smokers (OR = 0.08; 95%CI, 0.02-0.40; p = 0.002 and OR = 0.14; 95%CI, 0.04-0.50; p = 0.003, respectively); and sex: women were less likely to have IV coverage than men (OR = 0.28; 95%CI, 0.09-0.90; p = 0.032). For PV coverage none of the considered factors were significantly associated. Motivation towards vaccination was mainly due to previous medical recommendation (96.6% for IV and 96.1% for PV), while the chief hindrances towards vaccination were risk concerns for IV (54.3%) and economical concerns for PV (39.3%).
Conclusions: The application of the national recommendations pertaining IV and PV in our sample of CRP was found to be far from desired. Coverage for IV was higher in elder CRP (where IV tends to be free of charge regardless of the clinical condition) but both IV coverage in younger patients and overall PV coverage were considerably low. Further education on IV could be of benefit to resolve the main hindrance pointed out as the reason towards non-vaccination. Reimbursement issues should be discussed insofar PV non-vaccination.

***Key words**: Influenza vaccine. Pneumococcal vaccines. Vaccination coverage.*

CO 021. PNEUMONIA CAUSED BY MULTI-DRUG RESISTANT PATHOGENS IN THE COMMUNITY SETTING

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Introduction: The identification of pneumonia caused by a multi-drug resistant (MDR) pathogen is essential for an adequate treatment and reduction of mortality. The definition of Healthcare-associated pneumonia (HCAP) tried to predict which patients are at risk for a MDR pathogen infection in the community setting. However, it has been questioned, for its inability to predict correctly this group of patients and recommending the use of broad spectrum antibiotics for a large number of patients. Other risk factors for MDR pathogen infection have been studied to improve the efficacy of empirical treatment.
Objectives: To identify possible risk factors for MDR pathogen infection in patients with pneumonia coming from a community setting.
Methods: A retrospective study was conducted on patients admitted by pneumonia, who had specific pathogen isolation, between January/2015 and June/2017. Those who had nosocomial pneumonia were excluded to obtain a final sample (n = 92).
Results: From a total of 92 patients, 56 were male (60.9%). The mean age was 71.5 years and the mean days of admittance was 16.43. From the total, 39 had MDR pathogen pneumonia (42.4%). From the MDR pathogen group, the most frequently isolated was *MRSA* (n = 28). Other pathogens in order of frequency were *S. Pneumoniae* (n = 23), *P. aeruginosa* (n = 14) and *H. influenza* (n = 13). The most frequent empiric antibiotics used were the association of beta-lactam/macrolid and fluoroquinolones. The effectiveness of these regimens was confirmed in only 50% of cases. Most of the

times, MDR pathogen pneumonia was resistant to empirical antibiotics ($p < 0.001$). Patients with a MDR pathogen pneumonia, had more advanced ages and more days of total admittance ($p < 0.001$). It was diagnosed Community Acquired Pneumonia (CAP) in 62% and HCAP in 38%. We verified that diagnosis of HCAP had a relation with MDR pathogen infection ($p < 0.001$). In institutionalized patients (25%), there was a greater number of MDR pathogen pneumonia ($p < 0.001$). Patients with chronic tube feeding (10%), all had MDR pathogen infection. We verified a hospitalization for more than 48h within the previous year in 40% of the sample, which was associated with MDR pathogen infection ($p < 0.05$). The use of antibiotics in the previous 3 months (30%), was not associated with this risk. The presence of comorbidities was evaluated. Arterial hypertension was the most frequent (52.2%), followed by chronic respiratory disease (41.3%), heart failure (30.4%) and dementia (20.7%). Of these, only heart failure ($p < 0.05$) and dementia ($p < 0.001$) were associated with greater risk for MDR pathogen infection. Chronic therapy with a proton pump inhibitors (37%) or benzodiazepines (32.6%) correlated with MDR pathogen infection ($p < 0.05$). We verified 6 deaths during admittance, all by MDR pathogen pneumonia.
Conclusions: There is a considerable number of MDR pathogen pneumonia coming from the community. They present more resistances to empiric antibiotics and therefore higher mortality. For this sample, we identified multiple risk factors for MRD pathogen pneumonia some of which, not part of the HCAP definition. It will be necessary an individual evaluation of risk factors for MDR pathogen infection to justify broad spectrum empiric anti microbial therapy.

***Key words**: Pneumonia. Multi-drug resistant pathogen. Community.*

CO 022. ARE SCREENING TESTS FOR LATENT TUBERCULOSIS IN PATIENTS WITH CLINICAL INDICATION OF MONOCLONAL ANTIBODIES REALLY NECESSARY AND EFFICIENT FOR PREVENTION? – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: It is well known that there is a greater risk of developing tuberculosis infection in patients using monoclonal antibodies, such as anti-TNFs. Although there are recommendations for the screening of latent tuberculosis prior to the administration of biological therapy, its efficacy and ability to prevent (re) activation of the disease is still controversial.
Objectives: To evaluate the pattern of positive screening tests for latent tuberculosis prior to the initiation of biological therapy and determine whether these tests are effective in preventing disease onset in countries with high/moderate and low incidence of tuberculosis.
Methods: A comprehensive and systematic literature search was conducted in four electronic databases from its inception until October 22, 2017. The following terms were used to perform the searches: monoclonal antibodies, anti-TNF, latent tuberculosis, biological therapy, mass screening, *Mycobacterium tuberculosis*. The relevant articles were evaluated and selected, and we performed the conference procedures (eligibility) by two independent reviewers (kappa = 0.72, $p < 0.001$). For inclusion, studies should evaluate the results of screening tests for latent tuberculosis in patients on anti-TNF alpha therapy as a real need for screening tests for latent tuberculosis prior to initiation of treatment with monoclonal antibodies. The PRISMA recommendations for systematic reviews were followed: PROSPERO registration - CRD42018093837.
Results: It was observed that the studies present high methodological and clinical heterogeneity, with positive results ranging from 8 to 44%, both in low and high/moderate TB incidence countries. It was not possible to perform the analysis by diagnosis and type of medication, since there is no way to discriminate the patients selected in the samples.
Conclusions: The risk of developing active tuberculosis in patients taking anti-TNF persists even when LTBI is diagnosed and treated. Evidence suggests that LTBI should be screened before starting treatment with monoclonal antibodies, but screening and treatment schedules and strategies differ greatly across countries. The use of IGRA as the primary diagnostic method for LTBI remains controversial and not routinely recommended, and the definitions of TST still vary widely across studies. There is a need for more controlled studies, particularly in the number of patients in the sample, as well as methodologies that may be comparable.

***Key words**: Latent tuberculosis. Monoclonal antibodies. Mass screening. Systematic review. Evidence-based medicine.*

CO 023. CHARACTERIZATION OF THE HEALTH PROFESSIONALS NON-COMPLIANT WITH FOLLOW-UP AFTER OCUPATIONAL EXPOSURE TO ACTIVE TUBERCULOSIS

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Introduction: Tuberculosis is still an important biological risk factor for Health Professionals (HP) in Portugal. As a means to prevent active tuberculosis, identification and subsequent follow-up of HPs with non-protected occupational exposure to infectious patients, enables the detection and treatment of new infections. In case of incomplete follow-up, it becomes important to characterize the non-compliant in order to adequate and maximize the surveillance of these professionals.
Objectives: Clinical, professional and demographic characterization of HPs with non-protected occupational exposure to *Mycobacterium tuberculosis* (MTB) in the last 4 years, that did not comply with follow-up in the OHS.
Methods: Consultation of the registry of non-protected occupational exposures to MTB reported to the OHS-CHLN in the last 4 years. The non-compliant to the follow-up were selected. Descriptive analysis of the relevant Clinical, professional and epidemiological variables was done.
Results: 562 HP were summoned for follow-up after exposure, 25.8% of which never complied – no follow-up group – totalling 145 individuals aged 40.5 ± 10.56 years, with average seniority of 13.7 ± 9.31 years, mostly women (74.5%), homogenously distributed between nurses, doctors and operational assistants. Of 417 that complied with the initial follow-up, 181 HP (32.2%) did not return, of which, 35.7% ($n = 50$) had significant exposure, aged 38.7 ± 10.94 years, seniority 11.5 ± 8.89 years 84% women e 70.8% TT ≥ 10 mm (Tuberculin Test). Around 50% were nurses and 35.4% operational assistants. There were 343 HP with indication for second follow-up, of which 52.5% (180 did not comply. Even with significant exposure, 39 HP abandoned follow-up (37.7 ± 11.67 years, 11.4 ± 9.85 years of seniority and 90% women) – 22 nurses, 16 operational assistants and 1 doctor.
Conclusions: The non-protected exposure to tuberculosis, still seems to be undervalued, in our study, about a quarter of the HP, no matter the professional group, did not comply with adequate follow-up. Of those who complied with inital follow-up, around half did not return for further surveillance, predominantly non-medical staff.

Key words: *Health professionals. Latent tuberculosis. Non-protected exposure. Contact surveillance. Compliance with follow-up.*

CO 024. SMOKING PREVALENCE IN PREGNANCY

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Introduction: Smoking in pregnancy is associated with abortion, low birth weight, prematurity, stillbirth, sudden death syndrome, placental abruption, an increase in the number of nicotine receptors and future nicotine dependence in the newborn, as well as respiratory problems. There is evidence that smoking cessation during pregnancy improves maternal and fetal health. A smoking prevalence of 22.9% was found in a recent Portuguese study, based on a sample of 5,420 pregnant women in Porto.
Objectives: To determine the prevalence of smoking habits in first trimester pregnant women within the scope of the Prenatal Care Protocol of the Aveiro Maternal Health Coordinator Functional Unit. To characterize smoking habits of the smoking pregnant women identified.
Methods: Descriptive transversal study based on a self-administered questionnaire, which was proposed to every pregnant women that underwent the first trimester ultrasound in the Obstetrics Department of Hospital Infante D. Pedro (Aveiro) between April 2015 and April 2016. The studied variables include sociodemographic data, smoking habits, nicotine dependence, motivation for smoking cessation and partner's smoking habits. The statistical analysis was performed in SPSS®.
Results: In this period, 1,331 pregnant women undertook their first-trimester ultrasound, 1,085 of which accepted to participate in this study (81.5%). Their age varied from 13 to 43 years old (average 29.72 ± 5.63), most of them (66.1%) were married or living together with their partner and 30.1% were single; 72.1% were employed and 24.1% were unemployed; 29.9% had studied 9 years or less, 37% had studied 12 years and 31.4% had completed a university course. We found 164 smokers (15.1%). They smoked 1 to 20 cigarettes per day (average 5.26 ± 3.60), mostly (98.7%) with low nicotine dependence, measured by the Heaviness of Smoking Index (< 4). In this sample, 42.2% had smoked in previous pregnancies, 78% had a partner who was also a smoker, 44.6% had tried to quit smoking in the previous year and 66% considered to quit smoking within 1 month.
Discussion: The results point to a smoking prevalence in pregnancy in Aveiro district of 15.1% in 2015/16, lower than the one recently found in Oporto. The majority of smoking pregnant women live with a partner who is also a smoker, which highlights the importance of a family approach in this matter. The results also show that most pregnant women have a low nicotine dependence and consider quitting within 1 month, confirming the relevance of the health professionals' intervention in this family life-cycle moment.

Key words: *Smoking. Pregnancy. Prevalence. Smoking cessation.*

CO 025. IMPORTANCE AND EFFECTIVENESS OF A TRAINING SEMINAR IN SMOKING CESSATION

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Introduction: Smoking is one of the leading causes of preventable death worldwide. Healthcare professionals' major role in promoting smoking cessation has driven to enhanced learning programmes at undergraduate and postgraduate education on this subject in recent years. Nevertheless, a number of studies have found that many healthcare professionals lack knowledge and skills in available strategies and medication for smoking cessation which hinders their role in tobacco control. These gaps were also identified in a previous study carried out by the same authors among healthcare professionals of a central hospital but most subjects recognized the importance of smoking cessation and were interested in enrolling learning sessions.
Objectives: To evaluate primary care and hospital physicians' knowledge, experience, behaviour and attitudes towards smoking cessation and effectiveness of a training seminar in this subject.
Methods: We performed a one-day training seminar on smoking cessation aimed to physicians interested in this subject. A cross-sectional study was carried out among the attending physicians, using data collected from a voluntary self-report questionnaire. Physicians' behaviour and attitudes towards smoking cessation, previous training in this subject, knowledge after the seminar and its usefulness were evaluated. Descriptive statistical analysis was conducted to evaluate the sample.
Results: 69 physicians attended the seminar (mean age 32.3y; 84.1% females; 84.1% never smoked), 66.7% of which were Primary Care Physicians (PCP). Among hospital physicians (HP), 86.9% were pulmonologists. The majority of physicians from both groups were residents (58.7% of PCP and 87% of HP). Most subjects (97.1%) frequently asked patients about their smoking status considering them to be of great importance (94.2% of total participants). The majority (68.1%) had previous training in smoking cessation and 59.4% had experience in motivational interviewing on smoking cessation but few had experience in prescribing medication (31.9% of total participants). Only 53.6% had a specialized smoking cessation consultation available in their working place, which was mainly available in the hospital setting (86.9% of HP and 36.9% of PCP). The majority of physicians (85.5%) didn't practice specialized smoking cessation counselling but intended to start after the seminar (81.4%). They all found this seminar useful for their clinical practice and would recommend it to their fellows. Mean score in the post-seminar test evaluating knowledge in smoking cessation was 92.2%.
Conclusions: Regardless of smoking cessation awareness, up to one-third of physicians never had previous training in this subject, reinforcing the need for educational meetings. High scores in the post-seminar test and quality evaluation survey suggest effectiveness of this seminar. Most of specialized smoking cessation consultations were restricted to the hospital setting. PCP are corner stones in smoking cessation and are willing to take part in tobacco control, so it is crucial to enhance smoking cessation programs in primary care centres.

Key words: *Smoking cessation. Training seminar. Physicians. Knowledge. Atittudes.*

CO 026. AIRWAY MICROBIOTA DIVERSITY AND COMPOSITION CORRELATES WITH THE SEVERITY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Introduction: Chronic Obstructive Pulmonary Disease (COPD) occurrence and severity are mediated through complex interactions between the host immune system, environmental factors and microbial dysbiosis. Recent evidence suggested that the airway microbiota (the ecological community of commensal, symbiotic and pathogenic mi-

croorganisms) plays an important role in COPD severity but the clinical implications of this finding are still unclear and validated biomarkers are scarce. The airway microbiota might be however, manipulated through the use of antibiotics (e.g., azithromycin) or other strategies providing an additional prognostic and personalised therapeutic approach to COPD. Therefore, we aimed at exploring the dysbiosis of the airway microbiota in patients with COPD.
Methods: 40 patients with stable COPD (68 ± 9 years old, 6 female; FEV1pp = 32.5 ± 7.4; FVCpp = 65.1 ± 14; GOLD III-26, GOLD IV-14, 6A, 13B, 6C, 15D; Body Mass Index = 28.8 ± 7.6 Kg/m^2) were recruited from primary health care centers and hospitals. Sociodemographic, anthropometric and general clinical data (comorbidities, medication, number of exacerbations, hospitalisations in the last year, or long term oxygen dependence) were collected with a structured questionnaire. Peripheral oxygen saturation was assessed with a pulse oximeter and lung function with spirometry. Airway microbiota was collected from saliva samples and characterized by 16S rRNA sequencing.
Results: Significant differences were observed in the airway microbiota diversity and composition of patients according to the severity level of the disease and their symptoms. Specifically, a significant clustering effect by number of exacerbations and hospitalisations in the previous year was observed. Furthermore, the levels of airway obstruction (FEV1pp) and the peripheral oxygen saturation were also associated with a different microbiota composition. Consistent with increased dysbiosis, the diversity of the bacterial species present in patient's saliva, was lower in more severe patients. Ageing was also associated with loss of diversity. Though age is not directly related with the disease, older patients have taken a cumulative higher number of antibiotic courses through their lives, which should have contributed to their dysbiotic microbiotas.
Conclusions: The association between microbiota composition/diversity with disease symptoms or severity level supports a role for this trait in COPD trajectory, offering a window of opportunity for disease management. In fact, the long term goal of these studies is to guide the microbiota remodeling of patients towards healthier ensembles which is expected to have a significant positive impact on patient's clinical decline. In sum, the airway microbiota warrants further study, since it might provide a conceptual basis for novel therapeutic strategies to counteract a dysbiotic microbial community in COPD. This finding might open potential avenues for new biomarkers and personalised interventions in COPD.

Key words: *Airway microbiota. Dysbiosis. Chronic obstructive pulmonary disease. Personalized medicine. Remodelling of the microbiota.*

CO 027. THE ABCD ASSESSMENT TOOL – RELATIONSHIP WITH THE CLINICAL OUTCOMES OF PATIENTS WITH COPD

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The ABCD assessment tool for patients with chronic obstructive pulmonary disease (COPD) has recently been revised. Few studies have evaluated patients' clinical characteristics based on this classification, although it may be important to adjust interventions to patients' specific needs. This study explored the distribution of the most used clinical outcomes in patients with COPD across ABCD groups. A cross sectional study was conducted. Patients with COPD were recruited from routine pulmonology appointments and primary care centres in Portugal. Assessments included a spirometric test, quadriceps muscle strength (QMS) with handheld dynamometer, inspiratory muscle strength with the maximal inspiratory pressure (MIP), functional performance with the 1-minute sit-to-stand test (1-min STS) and health-related quality of life with the Saint George Respiratory Questionnaire (SGRQ). Patients were classified into ABCD groups based on the modified British Medical Research Council dyspnoea questionnaire and history of exacerbations in the previous year. One-way ANOVA and Bonferroni corrections for multiple comparisons were used to explore differences between groups. Three hundred and twenty-nine patients with COPD (253 (77%) male, 67 ± 10 years old, forced expiratory volume in one second 60 ± 25% of predicted, forced vital capacity 81 ± 23% of predicted, body mass index 28 ± 16 kg/m^2; 73 (22%) GOLD I, 133 (40%) GOLD II, 90 (27%) GOLD III, 33 (10%) GOLD IV) participated. Group A was the most prevalent (131; 40%), followed by groups B (95; 29%), D (70; 21%) and C (33; 10%). Patients from groups B and D, which are the most symptomatic, presented the worst results for all outcomes (Fig.). Patients from ABCD groups present different clinical characteristics. The ABCD classification appears to be important to discriminate patients with worst outcomes, hence it may be useful to

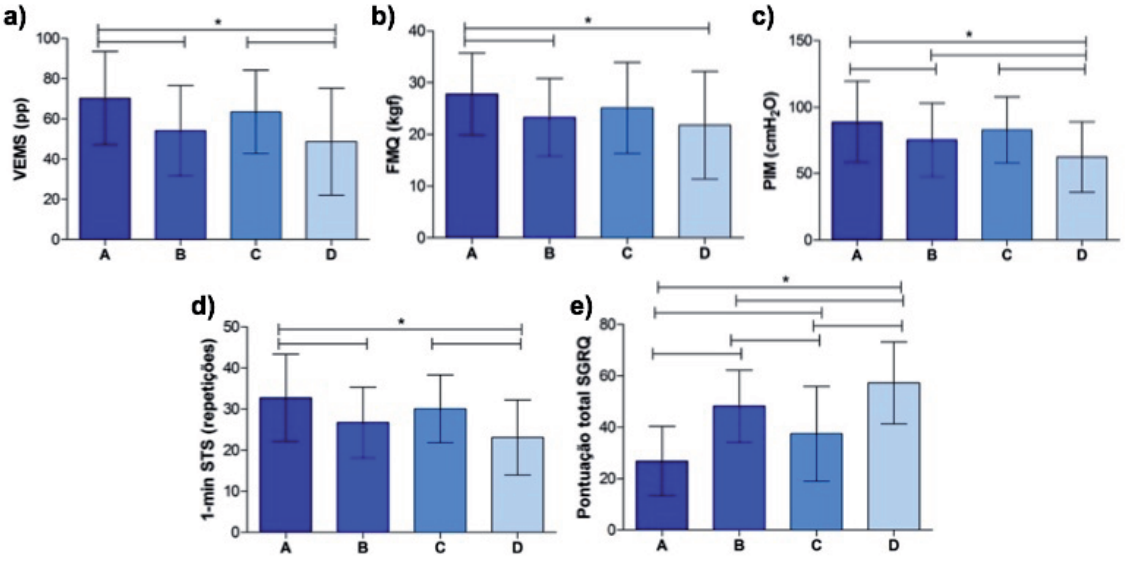

Figure CO 027. Mean and standard deviation in each group in a) Forced expiratory volume in 1 second (FEV_1 -% of predicted, pp); b) Quadriceps muscle strength (QMS – kgf); c) Maximal inspiratory pressure (MIP – cmH_2O); d) Number of repetitions at 1-minute sit-to-stand test (1-min STS); e) St. George Respiratory Questionnaire (SGRQ) total score.

personalise treatments according to patients' needs and clinical characteristics.

Key words: *COPD. ABCD assessment tool.*

CO 028. BRONCHIECTASIS IN COPD PATIENTS: MORE THAN A COMORBIDITY?

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Introduction: Bronchiectasis (BQ) in Chronic obstructive pulmonary disease (COPD) has been recognized as a potential new phenotype of COPD. The high prevalence of BQ in COPD patients has been associated to a greater symptomatic severity, more frequent chronic bronchial infection and exacerbations, and poor prognosis.
Objectives: The aim of this study was to evaluate the prevalence of BQ in COPD patients and its relationship to clinical features and outcomes.
Methods: A observational, retrospective study was conducted included COPD patients admitted in Pulmonology ward, in 2016 and 2017. We compared patients with BQ identified in thorax CT with patients without BQ. Categorical variables were compared with the use of χ^2 test, and continuous variables were compared with t-student test and Mann-Whitney test.
Results: Of the 61 patients included (90% men, 10% women, mean age 68 ± 11 years), 23 patients (38%) had BQ. The BQ patients were older (73 ± 10 years vs 67 ± 11 years, p = 0.04), were slighter smokers (54 ± 33 pack year vs 75 ± 36 pack year, p = 0.04) and had more severe airflow obstruction (FEV1:32% vs 43%; p = 0.03). No differences were observed in length of stay, number of exacerbations and admissions, hypercapnia on admission and in mortality between the groups. The C Reactive Protein value was similar between the groups (10 ± 12 vs 9 ± 11 mg/dL in BQ patients vs non BQ patients, respectively). The 3 patients infected with *Pseudomonas aeruginosa* belonged to BQ group.
Conclusions: In our sample, the prevalence of BQ was similar to that reported in the literature. BQ were observed in older patients, with more severe airflow obstruction and slighter smokers. No differences were observed between two groups in length of stay, mortality and in systemic inflammatory marker.

Key words: *Bronchiectasis. COPD.*

CO 029. IN ADDITION TO BMI - BODY COMPOSITION ASSESSMENT IN COPD PATIENTS

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Introduction: Chronic obstructive pulmonary disease (COPD) has multiple systemic effects in addition to deterioration of lung function. Weight loss, predominantly due to muscle loss, is associated with worse outcomes. Evaluation of body composition is fundamental in the follow-up of these patients. Information provided by the body mass index is useful, but scarce, being important to measure lean, fat, and bone mass. Currently this determination is made in a simple way using bioimpedance scales.
Methods: Retrospective study to evaluate the impact of fat and muscle mass on the evolution of COPD patients. Data obtained from a bioimpedance scale, respiratory functional test results, 6-minute walk test (SMWT) and clinical record was collected, with emphasis on the number of moderate or severe exacerbations in the previous 12 months. Data was analyzed using SPSS v.25.
Results: Fifty-nine patients with a previous COPD diagnosis were analyzed. Mean age 69 ± 9 years. Most patients were in the GOLD 2 or 3 category (37 and 47% respectively). There was a statistically significant relationship between desaturation in SMWT and GOLD stages ($p < 0.001$), being the most severely obstructed patients the ones who desaturate most. No statistical differences were identified between patient age and body composition ($p = 0.12$). Likewise, the GOLD stage did not show statistical impact on body fat ($p = 0.218$) or lean mass ($p = 0.502$). A significant positive correlation was found between muscle mass and peak expiratory flow (PEF) ($p = 0.001$, $R^2 = 0.411$) and maximal expiratory pressure (PEM) ($p = 0.001$, $R^2 = 0.415$). There was no significant differences between muscle mass and maximal inspiratory pressure (PIM) ($p = 0.064$) or forced expiratory volume in 1st second (FEV1) ($p = 0.585$). A significant negative correlation between muscle mass and the number of exacerbations ($p = 0.011$; $R^2 = 0.328$) was documented, showing that patients with greater muscle mass experienced fewer exacerbations. However, there was no statistical relationship between the amount of lean mass and the occurrence of desaturation in SMWT ($p = 0.545$). The existence of a significant relationship between fat mass and the occurrence of exacerbations ($p = 0.126$) was also excluded. We also investigated the relationship between the use of inhaled corticosteroids and the amount of bone mass, demonstrating that the distribution of bone mass is similar between patients regardless of whether or not they are under corticoid therapy.
Conclusions: Exacerbation is a limiting event and a definitive predictor of poor prognosis in patients with COPD. One of the primary objectives of follow-up of these patients is to minimize the risk of exacerbation. Despite the small sample size, data suggest that loss of lean mass is an important factor in the course of the disease and is associated with a higher number of exacerbations. The inclusion of patients with COPD in respiratory rehabilitation programs, besides allowing a symptomatic optimization with greater effort tolerance, potentiates the preservation or gain of lean mass which proved to be a protective factor, reducing the risk of exacerbation.

Key words: *COPD. BMI. Bioimpedance. Lean mass. Fat mass.*

CO 030. EDUCATIONAL INTERVENTIONS WITH INHALER REVIEW ON ELDERLY PATIENTS WITH ASTHMA OR COPD – A COST-EFFECTIVENESS STUDY AND A HEALTHCARE PERSPECTIVE IN PORTUGAL

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Introduction: Elderly patients with Asthma or COPD are particularly susceptible to exacerbations, mostly because they use inhalers incorrectly. Education programmes in adults seem to be cost-effective, but no studies have addressed interventions including inhaler technique review in elderly patients.
Objectives: To perform a cost-effectiveness analysis of education programmes in elderly patients, and estimate a theoretical scenario in Portugal.
Methods: We developed a decision tree analysis from a healthcare perspective, according to exacerbation rates and costs from a previous meta-analysis, and according to intervention costs. Sensivity analysis of worst and best-case scenarios was carried out to estimate thresholds for intervention affordable limits, as well as cost-saving estimations and ICER for a Portuguese scenario. We estimated cost-effectiveness thresholds applicable in all settings and performed a sensitivity analysis of a theoretical intervention model with all patients, including inhaler technique review at an annual appointment with a Doctor and a Nurse.
Results: In the best-case scenario, the intervention affordable budget could be up to almost €1.800 per patient per year. Mean intervention-associated savings in Portugal would be €311.88 per patient

per year, representing annual savings up to 300 million € for the whole health system. ICER for Portugal vary between €93.73 and €437.43 per exacerbation avoided.
Conclusions: Intervention programmes with inhaler technique review in elderly patients are cost-effective and can generate significant savings.

Key words: *Cost-effectiveness. Inhaler. Asthma. Chronic obstructive pulmonary disease. Elderly. Economics.*

CO 031. BLOOD EOSINOPHILIA IN PATIENTS WITH COPD

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Introduction: The impact of blood eosinophilia (BE) in COPD remains controversial.
Objectives: The aim of this study was to evaluate the prevalence of persistent high level of BE (PBE) (≥300 cells/uL) and its relationship to clinical features, outcomes and a predictor of response to inhaled corticosteroids (ICS) in clinical practice.
Methods: We determined BE over 1 year (at least 3 evaluations) in COPD pts followed as outpatient in our hospital, between 2016 and 2017. Our evaluation included: smoking habits, symptoms (mMRC), FEV1, GOLD classification, exacerbation history, hospitalization and pharmacologic treatment. We compared pts with PBE with pts that had low BE levels (LBE) in all evaluations. Categorical variables were compared with the use of chi-square test.
Results: Of the 134 pts followed, 16% had PBE at all 3 evaluations, 19% had counts that oscillated above and below the cut-off point, while 65% had LBE. 109 pts were included (PBE group: 82% men, mean age 71 ± 12 years and LBE group: 84% men, mean age 72 ± 9 years). Smoking habits and FEV1 were similar in both groups. In the group with PBE, 41% were GOLD B and 32% were GOLD D, whereas in group LBE 29% were GOLD B and 33% were GOLD D. Pharmacologic treatment included ICS in 59% of pts with PBE and 64% in LBE pts. Exacerbation rates and frequency of exacerbations that needed hospitalization did not differ in pts with and without persistent BE (41% vs 47% and 27% vs 38%).
Conclusions: In our sample, the prevalence of COPD pts with PBE is similar to that reported in the literature. No increased risk of moderate-severe exacerbations was found in pts with PBE. The treatment of 59% pts in PBE group and almost 64% pts in LBE group included an ICS suggest that BE is not used as a predictor of response to ICS.

Key words: *COPD. Eosinophils.*

CO 033. COPD CONSULTATION - A FUTURE REALITY?

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Introduction: Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable public health problem. Given the underdiagnosis present in Portugal, especially at primary health care, the National Program for Respiratory Diseases aims to double the number of patients diagnosed with COPD by spirometry in 2020 by increasing the diagnostic capacity of family doctors. One of the biggest problems is the coding error, changing the prevalence of diagnosis in the Health Unit (HU), which, according to the latest estimate, is around 14% nationally.
Objectives: To determine the prevalence of COPD and Chronic Bronchitis (CB) in the HU, to verify if the diagnosis is in accordance with spirometric criteria, to evaluate the treatment instituted and the records made, in order to register a consultation directed to COPD.
Methods: Observational, descriptive and cross-sectional study. Population: all HU patients diagnosed with COPD (R95), CB (R79) and asthma (R96), according to ICPC-2. Sample of convenience: patients with COPD and CB, exclusion criteria being the diagnosis of asthma alone. Variables: gender, age, spirometry and outcome, treatment performed, FEV1 record, smoking, profession and vaccination recorded on the patient record. The data were collected from the SClinico® program and treated in Excel® between April and June of 2018.
Results: The population coincided with 735 patients, of whom 104 had both COPD and/or CB and/or asthma. The sample included 206 patients with COPD and 178 patients with CB. In the COPD group: there was a male predominance (57%), mean age of 72.5 years, 70% had spirometry, and only 58% showed obstruction, 31% were treated with ICS-LABA, 27% did not undergo treatment and 6% had double therapy with LABA-LAMA. Only 28% had registered FEV1, 17% were smokers, 12% registered profession and 56% updated anti-influenza vaccine. In the CB group: female predominance (53%), mean age of 70.5 years, 38% underwent spirometry, showing obstruction in 41% of cases, 58% did not perform treatment and 25% had ICS-LABA. In this group, the FEV1, smoking and occupation registers are negligible and 43% presented updated vaccination.
Conclusions: In the HU, with around 14,000 patients, the prevalence of COPD is around 2%, which is clearly below the national level. There is a great difficulty in making the diagnosis, since only 41% (n = 206) of patients coded as COPD had spirometric criteria and 16% (n = 178) as CB patients should be coded as well as COPD. Another major fault lies in the recording of FEV1, given the failure to perform spirometry, which questions the existence of a spirometry network in the region in question. Limitations of the study: registry variability among professionals and lack/error in coding. The first step in initiating a targeted consultation will be to correct and confirm existing diagnoses using portable spirometers and to establish a protocol for proper spirometry recording.

Key words: *Diagnosis. Chronic obstructive pulmonary disease. Chronic bronchitis.*

CO 035. CFTR GENOTYPE AND LUNG FUNCTION IN CYSTIC FIBROSIS

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CHUC.

Introduction: Cystic fibrosis lung disease is generally described as an obstructive disorder with forced expiratory volume in one second (FEV1), usually used as a marker of disease severity and progression. However, other lung function patterns may occur, being the restrictive pattern present in advanced stages of disease due to fibrosis and lung destruction. Authors aim to characterize lung function in cystic fibrosis patients in "Hospitais da Universidade de Coimbra (HUC)" and evaluate possible genotype-phenotype associations.
Methods: Retrospective study analysing the clinical files of the 34 patients with cystic fibrosis in HUC during the year of 2017. Four patients were excluded since they had received lung transplant. Demographic data, best 2017 lung function data, microbiological results and hospitalizations from 2017 were analysed. CFTR mutations were grouped according to expected CFTR protein function: Group 1) patients carrying 2 mutations associated with null protein (FN/FN) and Group 2) patients with 1 or 2 mutations associated with residual function (FR/FR or FR/FN) Statistical analysis was made through SPSS, non-parametric tests were used due to the small sample size and the considered *p* value was 0,05.

Results: 30 patients were included, the majority (50%) reported obstructive lung pattern; 2 patients (6.7%) reported restrictive pattern, 5 (16.7%) a mixed pattern and 8 (26.7%) had no lung function alterations. 16 patients (53.3%) were included in Group 1 and 14 patients (46.7%) in Group 2. The mean age was 26.8 years in Group 1 and 41.29 years in Group 2, this difference was statistically significant. There was a statistically significant association between obstructive lung pattern, *P. aeruginosa* isolation and the total number of isolated microorganisms. Also, with statistical significance, hospitalization rate was higher in patients with restrictive lung pattern.
Conclusions: As described in the literature, the authors found that obstructive lung pattern is associated with a higher percentage of microorganism's colonization, in particular *P. aeruginosa*. No statistically significant differences were found between the groups created based on CFTR protein function, however, since Group 2 patients were significantly older, it may be a reflection of a less severe form of disease due to some CFTR protein function.

***Key words**: Cystic fibrosis. Lung function. CFTR genotype.*

CO 036. CHRONIC BACTERIAL COLONIZATION OF THE AIRWAYS OF ADULT PATIENTS WITH CYSTIC FIBROSIS - EVOLUTION OF THE PROFILE IN THE LAST 18 YEARS

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The Specialized Center of Cystic Fibrosis (CF) of the Hospital Center Lisboa Norte (CHLN) emerged as a specialist consultation in Pediatrics in 1989. Since then, the advances in therapeutics have been notorious both in terms of inhaled antibiotics and in terms of targeted therapy, which has been reflected in a frank clinical improvement and increased survival. At the same time, the therapy has effects on the profile of bacterial colonization of the airways. In order to analyze the evolution of this profile, a retrospective analysis of the bacterial infections in the airways of patients with CF over the last 5 years (2013 to 2017) was carried out, and a comparison with the isolates described in 2003 Rev Port Pneumol, IX (4): 337-352 (corresponding to the years 1995 to 1999) was made. In 2017, 103 patients - 55 children and 48 adults - were followed at the CHLN CF Center. In general, there was a reduction in the rate of chronic colonization by bacteria with greater relevance in CF (due to its prevalence and impact on the course of the disease). The prevalence of chronic colonization by methicillin-sensitive *Staphylococcus aureus* (MSSA) decreased from 54% in 1999 to 49.5% in 2017, *Pseudomonas aeruginosa* (PSAE) from 59% to 36.9% and *Burkolderia cepacia* (BC) from 7% to 5.8%. In contrast, the prevalence of chronic colonization by methicillin-resistant *Staphylococcus aureus* (MRSA) increased from 7% to 12.6%. These results are probably related to the increased use of antibiotics and from an earlier age and also reflect the higher prevalence of MRSA in the general population. In the subgroup of patients over 24 years of age who, due to the progressive nature of the disease, are generally more severe patients, the results were the opposite. All colonization rates have increased in the last 18 years. MSSA from 38% to 48.4%; MRSA from 15% to 16.1%; PSAE from 54% to 64.5% and BC from 0% to 6.5%. These results are probably related to the increase in life expectancy, which is reflected in a larger number of patients in this age group, with more advanced ages, and therefore a greater probability of chronic colonization. Chronic colonization by non-tuberculous mycobacteria, not recorded in the article with which the comparison is made, has increased over the last 5 years: 0% in 2013 to 3.9% in 2017. One of the main goals in treatment is to decrease the rate of chronic colonization with *Pseudomonas aeruginosa*, starting at the pediatric age. The registration and interpretation of microbiological data in a disease in which bacterial colonization may have a major influence on the prognosis is of the utmost importance since it may determine possible adjustments in the therapeutic protocols.

***Key words**: Cystic fibrosis. Colonization. Adults. Evolution.*

CO 037. FUNGAL COLONIZATION IN PATIENTS WITH CYSTIC FIBROSIS – ASSOCIATION WITH GENOTYPE

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Introduction: In patients with cystic fibrosis many opportunistic fungi such as *Candida* and *Aspergillus* species are frequently isolated. The rate of these fungal infections increases as the life expectancy of patients improves but in contrast to bacterial respiratory infections studies assessing the pathological consequences of these types of infections are still relatively small.
Objectives: To retrospectively assess a population of adult cystic fibrosis patients to determine the prevalence of fungal colonization and correlate genotype, BMI and lung function.
Methods: 32 adult patients with cystic fibrosis from the Outpatient Clinic of Coimbra University Hospital were included. Clinical files were reviewed in order to collect the following demographic data, sputum colonization, lung function (FEV_1), nutritional status (BMI), liver and pancreatic enzyme levels and sweat chloride test. For statistical purposes the patients were divided into two groups according to whether they had fungal colonization or not. Fungal colonization was defined as two or more positive cultures more than 6-months apart.
Results: Of the 32 patients, 8 (25%) were colonized by fungi. No difference was found between fungi and no fungi groups regarding genotype (little to no CFTR or some CFRT quantity), FEV1 (69 ± 10% vs 74 ± 6%) or BMI (23 ± 1 kg/m^2), neither pancreatic function. A positive tendency was obtained between fungal colonization and altered liver enzymes (p 0.06), maintained after correction for age, sex, number of antibiotics or microbial isolations. Number of hospital admissions in the previous year were similar (0.25 vs 0.54). A positive correlations was obtained between fungal colonization and the number of bacterial isolated, manly MRSA, *Pseudomonas aeruginosa* and *Burkholderia cepacia*, 2.3 ± 0.7 vs 1.5 ± 0.2, p 0.02. None of the patients had criteria of allergic bronchopulmonary aspergillosis.
Conclusions: In this study the prevalence of fungal colonization seems to be lower than found in the literature, and without correlation with disease severity or genotype. The positive correlation obtained between fungal and number of bacterial colorizations can translate the complex pattern of microbial interaction that still requires clinical correlation. The positive tendency between fungal colonization and cystic fibrosis-liver disease is interesting and can be further explored as a phenotypic correlation.

***Key words**: Cystic fibrosis. Fungal colonization. Genotype. Phenotype. Hepatic disease.*

CO 038. IMPACT OF BRONCHIECTASIS ON THE MORBIDITY AND MORTALITY OF PATIENTS ADMITTED TO A UNIVERSITY HOSPITAL CENTER

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Introduction: Bronchiectasis is a chronic inflammatory disease of the airways that is characterized by irreversible bronchial dilatation

and inadequate secretion clearance. Its clinical manifestations include productive cough, dyspnea and infectious exacerbations, which cause quality of life deterioration, lung function decline and mortality increase. In addition, the role of comorbidities in patients with bronchiectasis has been receiving increasing attention.
Objectives: To characterize and compare hospitalized patients with and without bronchiectasis, regarding the profile of comorbidities, the use of post-discharge hospital care and survival.
Methods: Cross-sectional study including all patients with chronic respiratory disease with at least one hospitalization in 2015 (N = 760) in the Internal Medicine Wards of a University Hospital Center. 134 patients were excluded because they did not have chest computed tomography scan available. The IBM® SPSS Statistics® software was used to perform chi-square and Mann-Whitney tests, Poisson model in use of hospital care resources and survival analysis models. A level of significance (alpha) of 0.05 was considered.
Results: The majority of the 626 patients who were analyzed were men and had a median age of 75 years. 62.9% of the cases (n = 394) had previous or active smoking habits and COPD was the most frequent respiratory comorbidity (41.2%, n = 258). It was found that 31.2% (n = 195) had bronchiectasis, with a prevalence of bronchiectasis-COPD overlap syndrome equal to 45.1%. The most prevalent nonrespiratory comorbidities were heart failure, hypertension, diabetes mellitus, chronic kidney disease and dementia. No statistically significant differences were found in demographic characteristics or in the prevalence of comorbidities between patients with and without bronchiectasis. Considering the 542 survivors after hospital discharge, the reduction in the Palliative Performance Scale (comparing admission and discharge scores) was higher in patients with bronchiectasis, although that difference was not statistically significant. In the patients without and with bronchiectasis, we evaluated the rates of Emergency Department visits (7.7% vs 10.5%, respectively) and rehospitalizations due to respiratory disease in the 12 months after discharge from the hospital (2.5% vs 3.9%, respectively) – these differences are statistically significant (p = 0.001 and p = 0.004, respectively). Mean survival at 12 months post-discharge was 9.9 months in patients without bronchiectasis and 9.4 months in patients with bronchiectasis, with consistently lower cumulative survival in the latter; however, the difference was not statistically significant.
Conclusions: Patients with and without bronchiectasis are globally comparable with respect to the prevalence of major respiratory and non-respiratory co-morbidities. However, in the group of patients with bronchiectasis, the rates of Emergency Department visits and rehospitalization, as well as the mortality rate at 12 months post-discharge, are higher. Thus, despite the importance of the remaining co-morbidities, bronchiectasis seems to represent per se a predominant factor in the outcome of hospitalized patients.

Key words: *Bronchiectasis. Respiratory comorbidities. Nonrespiratory comorbidities.*

CO 039. FACTORS ASSOCIATED TO BRONCHIAL COLONIZATION IN PATIENTS WITH BRONQUIECTASIS

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Introduction: Airway colonization and exacerbations are determinant in the clinical deterioration of patients with bronchiectasis (BQ). These are subject to colonization by potentially pathogenic microorganisms that perpetuate the triad: chronic infection, bronchial inflammation and progressive pulmonary structural damage that constitutes a "vicious cycle". This study aims to evaluate the characteristics and factors associated with bronchial colonization in patients with Non-Cystic Fibrosis Bronchiectasis (NCFBQ).
Methods: Retrospective analysis of clinical, functional, microbiological and radiological data of patients with NCFBQ followed in the last 5 years in the Pulmonology Department of Hospital Santa Marta. Two groups were compared: patients with and without bronchial colonization using Chi-Square and Mann-Whitney tests.
Results: 73 patients were included, and 17 (23.3%) had bronchial colonization. The group of colonized patients had a mean age of 60 years, was predominantly male (n = 10, 58.8%), and tuberculosis was the most frequent etiology of BQ (n = 8, 47.1%). Non-colonized patients had a mean age of 70 years, 55.4% (n = 31) were males and the most common etiology was idiopathic (n = 25, 44.6%). *Pseudomonas aeruginosa* was the main colonizing microorganism (n = 14, 82.3%), with unique cases of *Haemophillus, Aspergillus* and *Mycobacterium avium*-intracellulare colonization. In this sample, the most frequent comorbidities were cardiovascular (n = 35, 47.9%), COPD (n = 23, 31.5%) and psychiatric pathology (n = 14, 19.2%), between colonized and non-colonized patients. Despite the small sample size, the comparison between the two groups revealed that bronchial colonization was significantly associated with hospitalization due to BQ exacerbation (p < 0.001), as well as the number of hospitalizations in this period (p = 0.01). From the respiratory functional point of view, there were significantly higher Residual Volume values in the group of colonized patients, with a mean of 166 ± 68.2 (p = 0.03). A BMI < 18 kg/m^2 (p = 0.03) and high FACED (p = 0.04) and BSI scores (p = 0.01) also were significantly associated with bronchial colonization.
Conclusions: Bronchial colonization in NCFBQ patients is associated with the need and number of hospitalization (s) for exacerbation of BQ, as well as increased pulmonary hyperinflation. There is also an association with BMI < 18 kg/m^2 and high FACED and BSI scores. In view of the patients with these characteristics, the active research of colonizing microorganisms of the airway is determinant in order to reduce the impact of colonization on the evolution of the disease.

Key words: *Colonisation. Bronquiectasis.*

CO 040. RELATION BETWEEN FEV1 AND DLCO WITH HEPATIC FIBROSIS IN ALPHA-1 ANTITRYPSIN DEFICIENCY

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Introduction: Alpha-1 antitrypsin (A1AT) deficiency is a genetic autosomal codominant disorder caused by mutations in SERPINA1 gene. A1AT is a glycoprotein inhibitor of neutrophil elastase, preventing the proteolytic injury that it causes in pulmonary parenchyma. It is predominantly produced in the liver and its concentration increases in response to tissue damage and local or systemic inflammation. Mutant Z alleles encode unstable A1AT proteins that tend to form polymers whose hepatocyte cannot effectively excrete. The accumulation of these polymers, by different mechanisms of hepatotoxicity, is responsible for the chronic liver injury observed in this disease. A1AT deficiency is thus an established risk factor for chronic obstructive pulmonary disease and liver fibrosis (LF).
Objectives: To evaluate whether the decrease in FEV1 or DLCO are predictors of LF in this group of patients.
Methods: A retrospective study was carried out in which all patients with A1AT deficiency with follow up in a Pulmonary consultation in the Hospitals of the University of Coimbra with a transient hepatic elastography performed were selected. Significant FH was defined as liver stiffness ≥ 7.1 kPa evaluated by transient hepatic elastography. The data were compared with the last respiratory functional tests performed by the patients, all less than 1 year apart.
Results: Sixteen patients were selected. 9 (56.3%) were male, mean age (± SD) was 53 ± 15 years. 4 (25%) patients were on A1AT replacement therapy, and the mean value (± SD) of A1AT in the remaining

patients was 0.62 ± 0.26 g/l. 3 (18.8%) patients were former smokers, the remaining non-smokers. For phenotypic characterization, 6 (37.5%) were PiZZ, 5 (31.3%) were PiSZ, 3 (18.8%) were PiSS, 1 (6.3%) was PiMZ and 1 (6.3%) was PiMS. 4 (25%) patients had LF (3 PiZZ and 1 PiMS). The mean value of liver stiffness was 5.64 ± 2.24 kPa, in the affected patients it was 8.73 ± 0.76 kPa and in the remaining patients it was 4.62 ± 1.45 kPa. The mean value of FEV1 was 94.28 ± 25.47% of predicted, in patients with LF it was 86.83 ± 33.16% and in patients without LF it was 96.77 ± 23.62% of predicted. In DLCO, the mean value was 81.00 ± 19.64% of predicted in overall patients, 83.70 ± 31.25% of predicted in patients with LF and 80.10 ± 16.01% of predicted in patients without liver disease.
Conclusions: Although the value of FEV1 is lower in patients with LF, this does not appear to be a predictive indicator of liver disease. DLCO value was slightly higher in patients without LF. Studies with more patients are needed to corroborate these results.

***Key words**: FEV1. DLCO. Alpha-1 antitrypsin deficiency. Hepatic fibrosis.*

CO 041. ESTIMATING THE PREVALENCE OF AMYOTROPHIC LATERAL SCLEROSIS (ALS) AND MOTOR NEURON DISEASE (MND) IN PORTUGAL USING A PHARMACO-EPIDEMIOLOGICAL APPROACH AND A BAYESIAN MULTIPARAMETER EVIDENCE SYNTHESIS MODEL

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Introduction: Amyotrophic lateral sclerosis (ALS) is a rare and progressive neurodegenerative disease, representing the most common and with the worse prognosis among the motor neuron diseases (MND). ALS invariably progresses to respiratory failure, which is an essential factor affecting the prognosis of this disease. Its prevalence in the world is heterogeneous and, in many countries, it is unknown, since national registers are not mandatory. In the world, the prevalence of ALS/MND is estimated between 4 and 8 cases per 100,000 inhabitants, but in Portugal the prevalence is unknown.
Methods: Because ALS/MND are rare diseases, population-based studies are very difficult to perform and in Portugal there is no systematic patient registries, we aimed to obtain the best available indirect estimates of ALS/MND prevalence in Portugal using a pharmaco-epidemiological approach. We developed a Bayesian multiparameter evidence synthesis model, based on nationwide data of riluzole consumption, a drug highly specific for ALS/MND, combined with data from a nationwide hospital administrative database, data from the national institute of statistics and data from other scientific articles focused on the ALS/MND epidemiology, in order to estimate ALS/MND prevalence in Portugal.
Results: We found an estimated prevalence of ALS/MND in Portugal steadily increasing from 6.74 per 100,000 inhabitants [(95%CI): 5.39-9.37] in 2009 to 10.32 [95%CI: 8.27-14.27] in 2016. In 2016, the estimated prevalence of ALS/MND was higher in men, 12.08 per 100,000 [9.66-17.15], than in women, 8.56 [6.84-12.32]. Regarding age groups, the estimated prevalence per 100,000 were, in 2016 for women, 1.19 [0.78-1.85] for the bellow 50 years-old group, 8.48 [6.00-12.76] for the 51-60 group, 23.47 [18.05-33.88] for the 61-70 group, 28.77 [22.02-41.31] for the 71-80 group and 14.45 [9.97-21.63] for the above 80 years-old group. For men, the prevalence estimates were 1.90 [1.32-2.84], 12.89 [9.44-19.16], 32.18 [24.91-45.74], 48.85 [38.72-71.40] and 31.27 [21.73-46.41], respectively, for each age group. We also observed a relevant variability across the country, with prevalence estimates, in 2016, of 9.31 cases per 100,000 inhabitants [7.45-12.86] in the Northern region of Portugal, 11.15 [8.9-15.34] in the Centre region, 10.74 [8.6-14.82] in the Lisbon and Alentejo region and 5.55 [4.35-7.83] in the Algarve region.
Conclusions: Although we have to account for the limitations of the indirect methods and models used for prevalence estimation, in Portugal we most probably have a very high ALS/DNM prevalence. It would be important to create registries, particularly in rare diseases, for a better organization and distribution of healthcare services and resources, namely at the level of ventilatory support.

***Key words**: Prevalence. Amyotrophic Lateral Sclerosis.*

CO 042. HOME NON INVASIVE VENTILATION FOR CHEST WALL DISORDERS: A REAL-LIFE STUDY

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Introduction: Patients with chest wall disorder (CWD) who develop chronic respiratory failure (CRF) are candidates to home non invasive ventilation (NIV) due to its benefits in improving hypoventilation symptoms, arterial blood gases and decreasing hospital admissions related to respiratory complications.
Objectives: Descriptive analysis of patients with CWD under home NIV in our outpatient department.
Methods: We analyzed retrospectively the data of patients with CWD under NIV followed up in consultation in 2017.
Results: A total of 35 patients were enrolled in this study.

Age (mean ± standard deviation (SD))	70 ± 9.4
Gender (male) - no. (%)	19 (54.3%)
Length of follow-up, months (mean ± standard deviation (SD))	76.8 ± 52.1
CWD isolated-no. (%)	16 (45.7%)
Ventilatory mode-no. (%)	
S	6 (17.1%)
ST	19 (54.3%)
ST + volume-assured pressure support	9 (25.7%)
ST + volume-assured pressure support + autoEPAP	1 (2.9%)
IPAP (median-IR)	20-5
EPAP (median-IR)	6-3
Respiratory rate (median-IR)	14-1
$PaCO_2$ prior to NIV initiation (mmHg) (mean ± SD)	65.9 ± 18.7
$PaCO_2$ in last consultation during NIV (median-IR)	45.4 ± 7.5
Pulmonary function test (PFT) prior to NIV initiation	
FVC (%) (median-IR)	42-27.5
FEV1/FVC (%) (median-IR)	73-26.1
TLC (%) (median-IR)	73-43.4
Last PFT	
FVC (%) (median-IR)	42.2-17.8
FEV1/FVC (%) (median-IR)	78.1-20.6
TLC (%) (median-IR)	69-24.9
Exacerbations (≤ 1)-no. (%)	
2017	34 (97.1%)
2016	31 (88.6%)
2015	29 (82.9%)
Mortality-no. (%)	3 (8.6%
Secondary to respiratory failure-no. (%)	1 (2.9%)
Hours of NIV (median-IR)	8-3
Compliance (%) - (median-IR)	100-4

Conclusions: The most common ventilatory mode used by our patients was ST. We verified a significant decrease in PaCO2 after beginning NIV and our patients had a good therapeutic compliance.

Key words: *Chest wall disorders. Non invasive ventilation. Chronic respiratory failure.*

CO 043. NIVS.AM – DIURNAL PRESSURE TITRATION IN CHRONIC ALVEOLAR HYPOVENTILATION SYNDROMES

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Introduction: Noninvasive ventilation pressure support (NIVS) is a therapy with recognized benefits in the treatment of sleep-disordered breathing, namely chronic respiratory failure (CRF). On the other hand, NIVS in these patients may still prevent tracheal intubation or allow its early extubation.
Objectives: Assess the effectiveness of pressure titration in the sleep laboratory, during the daytime period in 2017, in the Pulmonology department of HSO-Guimarães, in patients with stable chronic alveolar hypoventilation syndrome.
Methods: Retrospective and non-randomized study with patients who underwent ventilator session at the Sleep Laboratory of the Pulmonology Department of the HSO - Guimarães, in the year 2017. All with polysomnographic monitoring (level I) and transcutaneous capnography. For the study were consulted the clinical processes and database of the service. All patients whose profile and motive session were related to sleep apnea were excluded.
Results: Out of a total of 253 individuals, 186 patients were excluded, whose referral was by sleep apnea and included 67 patients with chronic alveolar hypoventilation. Of these, 17 were neuromuscular disease patients (NMD), 11 patients with obesity hypoventilation syndrome (OHS) and 39 with obstructive pulmonary disease with chronic hypercapnia. In the NMD group, the mean age was 57.5 (± 17.2) years, 10 (58.8%) were men and the most common pathology was amyotrophic lateral sclerosis in 41.2% of the patients. The most frequent ventilators were the hybrid types (52.9%), with two settings, one for mouthpiece use and the other for mask use, with oronasal being the most used (70.6%), although they had nasal masks or nasal pillows. Regarding the ventilatory modes, in the pressumetric modes, mean EPAP = 5.8 (± 2.4) cmH_2O and IPAP = 18.9 (± 6.2) cmH_2O were observed. Patients with volumetric modes showed a variability of the programmed volume, with a minimum of 700 mL and a maximum of 1000 mL for mask use and 900 to 1,500 mL for the mouthpiece. Mean baseline pCO_2 was 47.3 (± 8.7) mmHg and the final mean was 38.8 (± 6.6) mmHg. In the OHS group, 6 were males with mean age of 57.7 (± 13.1) years and 72.3 (± 9.4) years in the female gender. Regarding the ventilatory mode, all had modes of pressure, 10 of which were bilevel mode and oronasal interface. The mean EPAP = 10.0 (± 1.7) cmH_2O and IPAP = 25.2 (± 2.8) cmH_2O was found. The mean baseline pCO_2 was 62.4 (± 8.4) mmHg and the final mean was 43.4 (± 8.7) mmHg. In the group of patients with obstructive pulmonary disease with chronic hypercapnia, the mean age was 69.8 (± 12.7) years and 71.8% were male. Regarding the ventilatory mode, all had modes of pressure and 74.4% of patients had oronasal interface. The mean EPAP = 8.0 (± 2.5) cmH_2O and IPAP = 22.9 (± 4.7) cmH_2O was found. Mean baseline pCO_2 was 59.5 (± 8.7) mmHg and the final mean was 44.1 (± 6.6) mmHg.
Conclusions: The results evidenced a significant improvement of the pCO_2 value in the titrations carried out in the daytime period, and this could be a viable alternative to night titration in the laboratory.

Key words: *Alveolar hypoventilation. Daytime PAP titration.*

CO 044. DUCHENNE MUSCULAR DYSTROPHY - 18 YEARS OF EXPERIENCE

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Introduction: Duchenne Muscular Dystrophy (DMD) is one of the most frequent muscular dystrophies, with inherited transmission linked to the X chromosome, which affects about 1/3,500 live male births. With the progression of the disease the patient develops respiratory insufficiency secondary to respiratory muscle weakness and spinal alterations, and at the end of the second decade, heart failure develops. Without ventilatory support, patients died on average at 20 years of age due to episodes of respiratory failure.
Objectives: Characterization of a population of patients with DMD followed at the CHUC-HG Neuromuscular Respiratory Support Consultation, from 2000 to 2018. To assess the impact of Non-Invasive Ventilation (NIV) on the survival and lung function of these patients.
Methods: Retrospective analysis of the clinical processes of the patients observed in the last 18 years, with evaluation of the demographic characteristics, complications of the disease, pulmonary function parameters, NIV initiation, survival under NIV and ventilatory parameters. Access to the clinical process of the Pediatric Hospital, where all patients were previously followed and started early NIV, as soon as documented diurnal and/or nocturnal hypoventilation.
Results: A total of 29 patients were seen in consultation. Of these, 17 died during the observation period, with a mean age of 22.6 ± 3.2 years at death. Of the remainder, 10 remain in the follow-up at the moment of the present study and two have changed the place of follow-up. The mean age was 31.7 ± 7.3 years for the living group. All patients required positive pressure bi-level ventilatory support. The mean age of onset of NIV was 17.8 ± 4.17 years. Of the total patients, 51.7% were under cough assist and 17.2% under mouthpiece. Cardiopathy was identified in 72.4% of patients. Spinal fixation procedures were applied to 74% of patients and 20.7% required placement of percutaneous gastrostomy. The median survival after initiation of NIV was 88.5 ± 69.9 months, with an annual loss of Forced Vital Capacity (FVC) of 92.2 ± 97 ml prior to NIV and of 34.0 ± 43 ml after NIV, which corresponds to a decrease of 3.8 ± 4.1% and 0.9 ± 0.9% of predicted respectively before and after NIV.
Conclusions: The study highlights the importance of NIV in the evolution of respiratory function, delaying the rate of FVC decay in these patients and allowing improvements in patients' survival and quality of life. Comorbidities are present in the majority of patients, so prevention, treatment and use of appropriate techniques/procedures should also be an objective of our intervention.

Key words: *Muscular dystrophy. Duchenne. Neuromuscular. Non-invasive ventilation.*

CO 045. HOME MECHANICAL INSUFFLATION-EXSUFFLATION IN NEUROMUSCULAR PATIENTS - CLINICAL OUTCOMES AND PATTERN OF USAGE

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Introduction: Neuromuscular disease (NMD) patients frequently have impaired cough that leads to secretion encumbrance increasing the risk of respiratory tract infections. Mechanical insufflation-

exsufflation (MI-E) has been proven to be efficient in improving airway clearance, however data related to the outcome of its long-term use is lacking. The purpose of this study was to evaluate the efficacy of Home MIE according to bulbar muscle function, ventilatory dependence, MIE experience and pattern of usage.
Methods: Patients were recruited from the neuromuscular clinic of the Pulmonology Department of Hospital São João, Porto. Inclusion criteria were neuromuscular disorder diagnosis with home MI-E prescription for at least 3 months and baseline PCF < 270 l/min. Exclusion criteria were medical instability and known chronic lung disease. Patients were followed up for three months and weekly MIE generated expiratory flows (MIE-EF) as well as MIE compliance were recorded by analyzing the device memory card download. Home MIE data was correlated with ventilatory impairment, bulbar muscle function and months of experience with the technique.
Results: A total of 18 NMD patients (50% males) with a mean age of 33.3 ± 25.1 years were enrolled. Five patients (27.8%) had mild to moderate bulbar dysfunction, 5 (27.8%) had severe bulbar dysfunction, 2 (11.1%) had severe bulbar dysfunction with spasticity and 6 patients (33.3%) had a tracheostomy for a mean time of 63.4 ± 44.6 months). Nine patients (50%) were ventilated 24h/day, 5 (27.8%) were ventilated < 16h/day and 2 (11.1%) were not ventilated. The mean MI-E Insufflation/exsufflation pressures were 46 ± 8/46 ± 8 cmH_2O, respectively, mean usage was 3.22 ± 2.5 times per day and 102.2 ± 83.2 times per month in all patients. We found no correlation between MIE usage per month and bulbar muscle function or ventilatory dependence, however patients with tracheostomy use more times MIE per week (18 ± 4 versus 33.6 ± 11.9). We found no correlation between usage pattern and the difference in the MIE-EF in the 3 months. The mean MIE-EF in all patients was 167.7 ± 73.5 L/min with no significant differences according to bulbar function. Patients with tracheostomy had a significant lower MIE-EF (121.4 ± 62.7 L/min, p < 0.005) when compared to bulbar patients without spasticity. Although there were no significant differences in MIE-EF values in the 3 months of recording, patients using MI-E ≥ 3 years increased MIE-EF in 59 l/min, patients doing MI-E from 1 to 2 years increased MIE-EF in 18.6 l/min and patients doing MI-E < 1 year decreased MIE-EF in 5.5 l/min (p = 0.009). No complications related to MIE were reported during the study period.
Conclusions: Home use of MI-E is safe and effective in compliant NMD patients. The physiological and clinical outcomes of home MIE seem not to be dependent on ventilatory impairment or bulbar function, however patients with spasticity and tracheostomy have lower MIE-EF. Moreover, MIE years of experience seems to have clinical impact on the efficacy of the technique.

Key words: *Mechanical insuflattion-exsufflation. Neuromuscular. Usage pattern.*

CO 046. PULMONARY REHABILITATION IN PRIMARY HEALTH CARE: AN EFFECTIVE INTERVENTION EVEN WITH MINIMAL RESOURCES

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Introduction: Pulmonary rehabilitation (PR) is a cornerstone intervention for the management of chronic respiratory diseases however it is underutilised and highly inaccessible to patients. In Portugal, most PR programmes are outpatient, hospital-based and directed to patients with advanced disease leading to less than 1% of patients having access to it. Recognising the urgent need to increase access to this fundamental intervention, the Portuguese National Health Service has determined that until the end of 2017, all Agrupamentos de Centros de Saúde should provide access to PR (Law n. 6300/2016). This study assessed the effects of PR conducted in primary health care centres (PHCC), with minimal resources.
Methods: A quasi-experimental pre-post study was conducted. Eligible patients with chronic respiratory diseases were identified by family doctors and refereed to PR. Sociodemographic, anthropometric and clinical data were collected with a questionnaire and lung function with spirometry. The following measures were collected: dyspnoea during activities with the modified medical research council-dyspnoea scale (mMRC); peripheral muscle strength in the upper limbs with the handgrip, in the lower limbs - quadriceps muscle strength (QMS), with the handheld dynamometry and respiratory muscle strength with maximal inspiratory and expiratory pressures (MIP/MEP); functionality with 1-minute sit-to-stand (1-min STS), exercise tolerance with the six-minute walk test (6MWT), functional balance with the Brief-BESTest and quality of life with the Saint George's Respiratory Questionnaire (SGRQ). All data were collected pre/post a 12-week PR programme implemented with minimal resources (pulse oximeters, blood pressure monitors, modified Borg scales, chairs, stairs, corridors, free weights built with bottles with sand, therabands and cushions), composed of exercise training twice a week and education and psychosocial support once every other week. Pre/post differences and effect sizes (ES) were calculated. For the measures with an established minimal clinical important difference (MCID), an analysis of the number of patients improving above that value was conducted.
Results: Eighteen patients participated (68.6 ± 1.9 years old; 11(61.1%) female; BMI = 29.5 ± 4.8kg/m^2; FEV1pp = 70.2 ± 4.9; FVCpp = 88.4 ± 24.3), 6(33.3%) with chronic obstructive pulmonary disease (FEV1pp = 61.7 ± 16; FVCpp = 89 ± 30; GOLD II-5, GOLD III-1, 1A, 4B, 1D), 8(44.4%) with asthma (FEV1pp = 79.1 ± 12; FVCpp = 92 ± 20.1), 3(16.7%) with Asthma-COPD Overlap Syndrome (FEV1pp = 67.7 ± 42.3; FVCpp = 88.7 ± 28.8) and 1(5.6%) with pulmonary fibrosis (FEV1pp = 58; FVCpp = 56). After PR, significant improvements were observed in all measures (Table). Concerning the MCID, 10(55.6%) improved above the established 1 point in the mMRC, 14(77.8%) patients above the 3 repetitions in the 1min-STS; 15(83.3%) patients above the 25m in the 6MWT, 7(38.9%) patients above the 4,9 points in the Brief BESTest and 11(61.1%) patients above the 4 points in SGRQ.

Results from pulmonary rehabilitation (n = 18)

Medidas	Pré	Pós	p	ES
mMRC M [IIQ]	2 [1-2]	1 [1-2]	0.003	0.81
Handgrip (kg)	25 ± 7.7	28.8 ± 7	0.002	0.53
FMQ (kgf)	25.9 ± 8	32.4 ± 6	0.0001	0.92
PIM (cmH_2O)	66.2 ± 26.8	75.3 ± 19	0.036	0.39
PEM (cmH_2O)	99.4 ± 38.7	107.7 ± 36	0.028	0.39
1-minSTS (repetições)	24 ± 9	32 ± 12	0.001	0.78
TM6M (m)	360.5 ± 80.6	435.4 ± 89.7	0.0001	0.88
Brief BESTest	16 ± 5.3	20 ± 3.5	0.0001	0.89
SGRQ	48 ± 14.6	38.8 ± 11	0.008	0.71

Values are presented as mean ± standard deviation or median [interquartile range]. mMRC: *Modified medical research council-dyspnoea*; QMS: Quadriceps muscle strength; MIP/MEP: Maximal inspiratory and expiratory pressures; 1-minSTS: 1-minute sit to stand; 6MWT: 6 minutes' walk test; SGRQ: *Brief BESTest* and *Saint George* Respiratory Questionnaire. Significant values p < 0.05. Effects sizes (ES) small (≥ 0.2), medium (≥ 0.5) and large (≥ 0.8).

Conclusions: Even with minimal resources, PR is feasible and possible to implement in PHCC, providing similar benefits to those well-established for PR programmes carried out in hospital outpatient settings.

Key words: *Pulmonary rehabilitation. Primary health care. Minimal resources.*

CO 047. MEASURING PHYSICAL ACTIVITY IN DAILY LIFE OF CHRONIC RESPIRATORY PATIENTS: SMARTREAB AND IPAQ

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Introduction: Physical inactivity is a modifiable risk factor for ill health and a consequence of chronic diseases. Chronic Obstructive Pulmonary Disease patients have great variability of low physical patterns, being physical inactivity an independent predictor of the risk of hospitalizations and early mortality.
Objectives: To characterize baseline physical activity in daily life (PADL) of chronic respiratory patients starting Pulmonary Rehabilitation.
Methods: Cross-sectional study with voluntary convenience sample (n = 70) of chronic respiratory patients on Pulmonary Rehabilitation. PADL assessment combined the International Physical Activity Questionnaire (IPAQ) and 4 days accelerometer and oximeter telemonitoring with SMARTREAB technology, a project supported by Fundação Vodafone Portugal.
Results: Only 44.3% (n = 31) of patients answered on a direct open question as currently physically active. According to IPAQ, most patients had moderate level of PADL (45.7%; n = 32), a weekly mean amount of 2,775.2 ± 2,928.7 MET.minute/week, and mean sedentary time of 469.9 ± 434.3 min/day. Alongside, SMARTREAB telemonitoring assessed maximum MET ranging from 1.51 to 4.64 MET, with 99.4% daytime spent on activities less than 3 MET. SMARTREAB also detected 97.1% (n = 68) of patients with desaturation episodes unobserved in clinical setting, namely 6 minute walk test. According to SMARTREAB, regardless the IPAQ category or reported physical activity habits, patients spend at least 75% of daytime with less than 2 MET activities.
Conclusions: SMARTREAB telemonitoring provided additional value to subjective measurements as an objective method to characterize the PADL of chronic respiratory patients.

Key words: *Physical activity. Telemonitoring. Respiratory diseases. IPAQ. SMARTREAB.*

CO 048. BALANCE IMPAIRMENT IN CHRONIC RESPIRATORY PATIENTS – PRELIMINARY RESULTS OF A PROSPECTIVE STUDY WITHIN AN OUTPATIENT PULMONARY REHABILITATION SETTING

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Introduction: Balance integrity is critical for an individual's functional independence. Chronic respiratory patients (CRP) share risk factors that have been associated with an increased propensity for balance impairment, such as muscle weakness and consumption of multiple medications. Pulmonary rehabilitation (PR) is currently regarded as a standard of care for most CRP, but balance issues are not routinely evaluated by most PR settings.
Objectives: To evaluate balance integrity in a population of unselected CRP proposed for PR and to unveil potential factors associated with balance impairment.
Methods: We designed a prospective study that consists on the baseline recollection of demographic data, main diagnosis, results of pulmonary function tests, distance walked in the six minute walk test (6MWT), mMRC dyspnea scores and the fulfillment of three balance tests: the Time Up and Go (TUG) test, the Tinetti test and the Activities-Specific Balance Confidence (ABC) scale. All patients referred to our program were offered the possibility to voluntarily participate upon written informed consent form. The study is ongoing since September 2017. Statistical analysis was performed with the software SPSS version 24. Results are presented as medians and range for non-normally distributed continuous variables and as number/total for categorical data. Inferential statistics was performed with U-Mann-Whitney test considering a significance level of 5%.
Results: Up until the end of June 2018 we were able to enroll a total of 17 patients, mainly male (15/17) aged 67 years (35-78 years). The most frequent diagnosis was COPD in 12/17 patients, followed by diffuse lung diseases (DLD) in 5/17 patients. The FEV1 was 43.9% (19.4–121.9%) and the distance walked at the 6MWT was 409m (267-500m). The mMRC was equal or superior to 2 in 11/17 patients. The results of the balance tests revealed a median TUG of 6.66 seconds (5.63-8.82 seconds), a median Tinetti test of 26 (22-28) and a median ABC scale of 73.63% (39-94). Of total, 11/17 patients had at least one abnormal balance test. No associations were found so far concerning balance impairment and all the variables under analysis.
Conclusions: Balance impairment seems to be frequent finding within our population of CRP as assessed by simple measurement tools. However further data is required validate these preliminary results and to better understand the factors associated with that impairment.

Key words: *Pulmonary rehabilitation. Balance. Chronic respiratory patients.*

CO 049. SATISFACTION DEGREE OF PATIENTS WITH OBSTRUCTIVE SLEEP APNEA FOLLOWED AT PRIMARY CARE

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Introduction: Obstructive sleep apnea (OSA) is a highly prevalent disease, reason why hospital sleep units are already overcrowded. Because of this, Portuguese General Direction of Health implemented a new model in 2015, in order to transfer the follow-up of these patients whit OSA on continuous positive airway pressure (CPAP) and clinically stable from the Hospital to the Primary Care (PC).
Objectives: To evaluate the satisfaction degree of patients with OSA on CPAP treatment with the exchange of the follow-up, from the Hospital appointment to the PC.
Method: We analyzed the first patients who were discharged from the Sleep Disorders outpatient clinic at a central hospital, since January of 2016 till July of 2016. The study was carried out through a questionnaire filled by the own patient, with questions about the evaluation of the quality of these patient's follow-up by the pulmonologist, the general practitioner (GP) and the home respiratory care company (HRC) technician. The questionnaire had closed answers, like satisfaction scale type.
Results: From the 146 patients who were discharged of the Sleep Disorders outpatient clinic at the considered time, 143 answered the questionnaire. Most of the patients were men (85.3%), with an average age of 62.2 ± 9.9 years old. After the hospital discharge till the moment that the questionnaire was answered, these patients had a mean follow-up time in PC of 17.6 ± 1.9 months, with a mean of 2.7 ± 1.4 appointments; 9% of these patients didn't have any appointment since the discharge. Around 94.3% of the patients were satisfied/very satisfied with the general care received by the pulmonologist, being the most part of them satisfied/very satisfied with the verbal and written information, as an information flyer, provided by the pulmonologist at the hospital discharge day (88% and 84.5%, respectively). Around 94.4% of the patients considered that the HRC technician was easy to contact and 95.1% were satisfied/very satis-

fied with the assistance received by them, however, only 72.6% answered that the technician gave the CPAP report on time for the PC appointment. Only 60.9% of the patients took the CPAP report from the technician to the GP; 80.4% considered easy to arrange the PC appointment; 67.1% felt confidence about the quality of the PC follow-up and 59.5% of the patients were satisfied/very satisfied with the general care received by the GP. Only 56.7% of the patients considered that the exchange of their OSA's follow-up from Hospital to PC had simplified the prescription renewal and 67.8% answered that this exchange contributed to a benefit on saving time and traveling.
Conclusions: In a general way, patients with stable OSA on CPAP treatment were satisfied with the change of their follow-up to the PC. However, it's still crucial to rectify some points, as for example, the reduction of the number of patients without PC follow-up appointments after hospital discharge or those who don't take the treatment report to the GP appointment.

***Key words**: Obstructive sleep apnea. Primary Care. Follow-up.*

CO 050. VALIDATION OF A NOSAS SCORE AS A SCREENING TOOL FOR OBSTRUCTIVE SLEEP APNEA: ANALYSIS IN A SLEEP CLINIC

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Introduction: Screening methods have become increasingly important due to the growing number of patients suspected of having obstructive sleep apnea (OSA) being referred to sleep clinics. The Lausanne NoSAS Score test is a simple, efficient, and easily employed tool enabling identification of individuals at risk for the disease. The score ranges from 0 to 17 and the patient has a high probability of OSA if they have a NoSAS score of 8 or higher.
Objectives: To evaluate the performance of the NoSAS score in the diagnosis of OSA in a sleep centre.
Methods: Prospectively, for 12 months, all patients referred by primary care physicians to our sleep unit for clinical evaluation, and underwent in-lab polysomnography (PSG), also completed the NoSAS score (Neck circumference, Obesity, Snoring, Age, Sex). This test assigns 4 points for having a neck circumference of more than 40 cm, 3 points for having a body-mass index of 25 kg/m^2 to less than 30 kg/m^2 or 5 points for having a body-mass index of 30 kg/m^2 or more, 2 points for snoring, 4 points for being older than 55 years of age and 2 points for being male.
Results: Of the 294 patients, 70.7% were male, aged 53.48 ± 12.08 years, with a neck circumference of 41 ± 3.6 cm and a BMI of 30.8 ± 5.06 kg/m^2. OSA was present in 84% of the patients, 34.8% with moderate OSA and 36.4% severe. Using the NoSAS model for the prediction of all OSA, moderate/severe OSA and severe OSA, the area under the ROC was 0.770 (IC95%: (0.703; 0.837), p < 0.001), 0.746 (IC95%: (0.691; 0.802), p < 0.001) and 0.686 (IC95%: (0.622; 0.749), p < 0.001), respectively, thus confirming the diagnostic ability of this model. With a NoSAS score ≥8, the sensitivity and positive predictive value (PPV) were 87.4% e 88.5% for all OSA, 89.8% and 64.8% for moderate/severe OSA and 94.4% and 34.8% for severe OSA, respectively. With the same cut-off, the negative predictive value (NPV) for moderate/severe and severe OSA were 64% and 90%, respectively. As the score increased from 8 to 12, the specificity and PPV increased continuously from 40.4% to 83% and 88.5% to 94.7% for all OSA, 27.1% to 74.6% and 64.8% to 80% for moderate/severe OSA, and 22.1% to 57.8% and 34.8% to 42.7% for severe OSA, respectively. A score of 7 and 6 had a NPV for moderate to severe OSA of 67% and 72%, respectively, and a NPV of 100% for severe OSA.
Conclusions: The NoSAS score showed high sensitivity and PPV for OSA with specificity steadily increasing with higher scores. Furthermore, a low score showed high predictive value for the exclusion of moderate/severe OSA. Overall, our results suggest that this score can be a powerful tool for stratifying patients in the diagnosis of OSA. Nevertheless, more studies are needed to evaluate the efficacy of this score in younger populations, with a predominance of female and non-obese individuals.

***Key words**: Obstructive sleep apnea. NoSAS score. Screening. Diagnosis.*

CO 051. SLEEPING HABITS IN STUDENTS FROM FACULDADE DE MEDICINA DE LISBOA

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Introduction: For many students, the faculty is a critical transition time that is associated with an insufficient number of sleeping hours as well as poor sleep quality. Chronic sleep deprivation, in addition to being common among medical students, is comparatively more prevalent than in students from other areas and there are no studies in Portugal on this subject in medical students.
Objectives: To characterize and compare the sleeping habits of medical students of Faculdade de Medicina de Lisboa (FML) of every year during the academic year of 2016/2017.
Methods: An anonymous, self-rating, non refundable online survey was created and emailed to all six years students of Faculdade de Medicina de Lisboa using an online platform called Survs®.
Results: All six years students of Faculdade de Medicina de Lisboa, beside the right idea about the number of hours that they should sleep, most of them during the class period sleep only 6-7 hours per night and in the examination period the pre-clinical years (1st to 3rd) sleep less hours than the clinical years (4th to 6th) and they also had more daytime sleepiness, depression, anxiety and stress than the clinical years.
Conclusions: The pre-clinical years students revealed worst outcomes comparing with the clinical years on the number of hours slept during the examination period, daytime sleepiness, depression, anxiety and stress.

***Key words**: Sleeping habits. Medical students. Faculdade de Medicina de Lisboa.*

CO 052. DISCRIMINATION OF HYPOPNEA IN EVERYDAY PRACTICE: IS IT WORTHWHILE?

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Introduction: Discrimination of hypopneas as obstructive or central is actually recommended for the correct diagnosis of sleep apnea. The proportion of patients at risk of central disturbances is increasing (e.g., patients with cardiovascular or cerebrovascular diseases) so we have to be sure that we are correctly identifying central hypopneas. The aim of this study was to evaluate if discrimination of hypopneas in everyday practice is worthwhile.
Methods: We conducted a retrospective observational study. All the in-laboratory polysomnography (PSG) of the last 12 months and type III home sleep apnea testing (HSAT) of the last 6 months, realized for suspected sleep apnea, were analyzed. The noninvasive algorithm proposed by Randerath and the recommendations of the AASM (2018) were used for differencing central of obstructive hypopnea. Sleep apnea (AHI ≥ 5) was classified as obstructive (OSA) if < 20% of

central apnea/hypopnea (A/H) events; central (CSA) if ≥ 50% and mixed if 20-49%.
Results: 316 sleep study were analyzed: 214 (HSAT) and 102 (PSG). The mean age was 55 ± 13 with a predominance of males (66%). Most patients had comorbidity associated: 49% HTA; 38% dyslipidemia; 17% diabetes mellitus; 6% coronary disease; 4% stroke history and 4% atrial fibrillation. Sleep apnea was present in 86% patients, most of them had OSA: 95% without hypopnea classification and 84% with hypopnea classification (p = 0.000). Regarding severity of sleep apnea, 49% had mild SA, 30% moderate SA and 21% severe sleep apnea. The median proportion of central events with and without hypopnea classification was 4% vs 0.0% (p = 0.000). The prevalence of mixed sleep apnea and CSA was higher with hypopnea classification when compared without hypopnea classification (11% vs 2%, and 5% vs 2% respectively, p = 0.000). 33 (12%) patients had wrong diagnosis when hypopneas were not discriminated: 27 had diagnosis of OSA instead of mixed sleep apnea; 4 patients OSA instead of CSA and 2 patient mixed sleep apnea instead of CSA.
Conclusions: The clear discrimination of central and obstructive hypopneas is necessary in order to avoid misinterpretation and inappropriate treatment of complicated breathing patterns.

Key words: *Obstructive sleep apnea. Central sleep apnea. Hypopnea.*

CO 053. ASSOCIATION BETWEEN MONOCYTE/HDL RATIO AND OBSTRUCTIVE SLEEP APNEA SYNDROME

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Introduction: Obstructive sleep apnea syndrome (OSAS) is characterized by repetitive episodes of limitation of airflow, which result in intermittent nocturnal hypoxia and sleep fragmentation, being associated with an increase of cardiovascular diseases' risk. It has been shown its association with activation of the pro-inflammatory factors IL6, C-reactive protein, and TNF-α. Recently, novel biomarkers such as monocytes/HDL-cholesterol ratio (MHR) have been proposed as indicators of systemic inflammation. Nonetheless, there are still few studies that evaluate the association between MHR and the severity of OSAS.
Objectives: To evaluate the MHR as a new marker of the severity of OSAS.
Methods: We conducted a cross-sectional study that included male patients with mild, moderate and severe OSAS. Patients with other sleep disorders, neuromuscular pathology, renal disease, thyroid pathology, heart failure, neoplasms, chronic inflammatory diseases or prior positive airway pressure use were excluded. Clinical, polysomnographic and laboratory parameters were analyzed. It was evaluated the association of MHR with the severity of OSAS and the time with oxygen values under 90% (T90), using a binary logistic regression model, including the variables with statistically significant association in the bivariate analysis. Statistical analysis was performed using SPSS version 24 (Chicago, IL, USA).
Results: The study included 72 patients (mean age 46.4 years), of which 45 (62.5%) had mild/moderate OSAS and 27 (37.5%) had severe OSAS. HDL cholesterol was significantly lower in patients with severe OSAS comparing with mild/moderate OSAS patients (41; interquartile range (IQR) 10 vs 47; IQR 10; p = 0.004). Monocyte's serum level was higher in severe OSAS patients comparing with mild/moderate OSAS patients, though without statistical significance (470 IQR 160 vs 470 IQR 170; p = 0.055). MHR was significantly higher in the severe OSAS group, when compared with the mild/moderate OSAS (11.30 IQR 4.99 vs 9.25 IQR 3.38; p = 0.003). Considering this association we made a binary logistic regression model, in which we included possible bias (age and BMI). An association between MHR and OSAS severity was observed. For each increase of one unit in MHR, there was an increase of 22.4% of the probability of having severe OSAS (OR 1.224; 95%CI [1.038 -1.443]). No statistically significant correlation between MHR and T90 was observed.
Conclusions: Monocytes/HDL-cholesterol ratio is a novel biomarker, inexpensive and quickly measurable that could help to identify patients with severe OSAS.

Key words: *Monocyte/HDL-cholesterol ratio. Obstrutive sleep apnea syndrome.*

CO 054. SLEEP QUALITY AND RISK FOR OBSTRUCTIVE SLEEP APNEA IN A SAMPLE OF THE PORTUGUESE POPULATION

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Introduction: Sleep-related disorders, particularly obstructive sleep apnea syndrome (OSAS), influence the quality of sleep and have increased in prevalence over the last years.
Objectives: The aim of this study was to characterize the risk of OSAS and sleep quality of a sample of the Portuguese population, as well as to verify the existence of a correlation between the two variables.
Methods: Sleep quality and risk of OSAS were assessed using the Pittsburgh Sleep Quality Index (PSQI) and the STOP BANG questionnaire respectively in 272 subjects. The median age was 53 ± 17.9 years, of which 66.2% were female (n = 180) and the median body mass index was 20.6 ± 4.4 Kg/m^2.
Results: Of the sample, 34.2% (n = 93) of the individuals presented a high risk for OSAS and 20.2% (n = 55) presented a moderate risk. In the majority of the sample (64.7%, n = 176), sleep quality was poor. The mean scores for STOP BANG and PSQI were 2.5 ± 1.5 and 7.2 ± 4.6, respectively. The mean STOP BANG score was significantly higher in subjects with poor sleep quality (2.7 ± 1.6) compared to the subgroup with good sleep quality (1.8 ± 1.6, p < 0.001). A positive correlation was found between STOP BANG and PSQI (r = 0.29, p < 0.001).
Conclusions: The majority of this sample of the Portuguese population presented poor sleep quality and a mostly moderate-high risk for OSAS. It was also found that the higher the STOP BANG score, the lower the quality of sleep, confirming the negative influence of OSAS on sleep quality.

Key words: *Sleep quality. Sleep apnea.*

CO 055. *NOT AN EZ TASK*: TRANSIÇÃO COORDENADA DE ADOLESCENTES/JOVENS ADULTOS COM DOENÇA PULMONAR CRÓNICA

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Introduction: The prevalence of children with chronic lung diseases (CLD), including cystic fibrosis (CF), post-infectious bronchi-

olitis obliterans (BOPI), bronchopulmonary dysplasia (BPD), severe asthma (SA) and bronchiectasis (Br), reaching adulthood has increased significantly. These are orphan diseases and these patients should be considered as having special needs. Transition of patients from pediatrics to adult medicine should ensure coordination and continuity of care and includes patient and family preparation, extends beyond the discharge period, and focuses on the transfer of clinical information between professionals. An inadequate process of transition compromises adherence to clinical appointments and therapy and increases the rate of hospitalization, including in intensive care.

Objectives: To describe the health transition process of adolescents/young adults (AYA) with CLD and to evaluate a few indicators of success.

Methods: In 2015 the population of AYA with CKD determined the need to structure a coordinated transition process from Pediatric Pulmonology to Adult Pneumology care. In this process the teams were built, the transition was scheduled and with the approval of both Department Directors, the transition outpatient clinic was created. The flowchart included an electronic patient report, scheduling of the adult appointment, feedback, and periodic evaluation meetings. Successful adherence to the first and subsequent visits, absence of hospitalizations and maintenance of follow-up are considered short-term indicators of success.

Results: Of the 58 who reached 18 years of age with CLD for the last two-years, 18/31 (58.1%) were transferred to the Adult Transition Pneumology Clinic in the same hospital, with the remaining transfers being made according to severity for the respective residency areas (hospital and outpatient care). Of these 11 (61.1%) were males, mean age was 24.33 (± 3.55) years at the transition point. Diagnosis of BOPI in 12 (66.7%) patients, 1 BO post-transplantation of bone marrow, 2 with severe asthma, 2 with bronchiectasis and 1 has alveolar proteinosis. At the transition, mean FEV1%T was 55.43 (± 19.68); z-score -3.71 (± 1.67); FVC%T 80.11 (± 14.05); z-score -1.49 (± 1.14) and FEV1/FVC 58.79 (± 15.36). FEV1z-score values < 1.62 were found in 11 (61.1%) patients. Adhesion to the first appointment scheduled in Adult Pneumology was found in 83.3%, and 66.7% maintained adherence to the monitoring plan, 3 patients were lost to follow-up at the time of study. Structured follow-up was found in all but 2 patients. The mean number of annual consultations was 1.94 (± 0.85) and 6 (33.3%) were referred for respiratory rehabilitation. There were no admissions in these patients for the referral period.

Conclusions: This study confirms the feasibility of a coordinated model of transition from chronic respiratory patients from pediatrics to adult medicine. The short-term results confirm the maintenance of clinical stability of these patients. Subsequent studies highlighting difficulties and evaluating the satisfaction of patients and their families in the transition process are imperative.

***Key words**: Chronic lung disease. Transition. Adolescents. Young adults.*

CO 056. TRANSCUTANEOUS CO2 MONITORING DURING SIX-MINUTE WALK TEST IN COPD PATIENTS WITH CHRONIC HYPERCAPNIC RESPIRATORY FAILURE- A PILOT STUDY

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Introduction: Six-minute walk test (6MWT) is a widely used prognostic and stratification tool in chronic obstructive pulmonary disease (COPD). Dynamic hyperinflation and reduced gas exchange capabilities in advanced COPD may account for CO_2 retention during exercise. Current literature provides no data on the development of exercise-induced hypercapnia (EIH) in patients with severe COPD and chronic hypercapnic respiratory failure (CHRF) under nocturnal non-invasive ventilation (NIV).

Objectives: We aim to investigate transcutaneous PCO_2 ($TcPCO_2$) trends during 6MWT in COPD patients with CHRF under NIV.

Methods: Stable COPD patients with CHRF who were receiving supplemental oxygen therapy during exertion and nocturnal domiciliary-NIV for at least two months were prospectively recruited. All participants underwent a 6MWT (according to ATS guidelines) using supplemental oxygen set at the prescribed exertional flow. Oxygen saturation ($SatO_2$), heart rate (HR) and $TcPCO_2$ were continuously measured using a digital-monitoring system (TCM5 by Ratiometer®) carried by a well-trained health-care professional. EIH was defined as peak of $TcPCO_2$ superior to 45 mmHg. Pre and post-walk perceived dyspnea and leg fatigue were assessed using the Modified Borg Dyspnea Scale (0-10) and the Perceived Exertion Borg Scale (6-20), respectively. Data regarding demographic characteristics, anthropometric parameters and lung function tests were collected from medical records.

Results: Thirteen patients (7 males) were included: mean age 65 ± 11 years; BMI 25.1 ± 5 Kg/m^2. Lung function tests showed severe to very severe airflow limitation (mean FEV1 = 34.2 ± 9.7% pred) and static lung hyperinflation (mean RV = 229.3 ± 47.9% pred; TLC = 133.4±18.9% pred). All patients were normocapnic at rest (mean $TcPCO_2$ = 39 ± 2.2 mmHg) and the 6MWT was performed using supplemental oxygen at prescribed exertional flow (mean O2 flow = 4 ± 2 L/min). During 6MWT, most patients demonstrated preserved exercise capacity (mean 6MW distance = 366 ± 63 m; 75.7 ± 9.9% pred), exercise induced desaturation (mean ΔSatO2 = -7.5 ± 4.8%) and adequate HR response (mean ΔHR = 32 ± 10 b/min). There was an increase in $TcPCO_2$ in all patients (mean $\Delta TcPCO_2$ = 2.1 ± 1.2 mmHg). The mean peak value of $TcPCO_2$ was 41.1 ± 2.6 mmHg; one patient achieved peak $TcPCO_2$ of 45 mmHg. Patients who demonstrated $\Delta TcPCO_2 > 2$ mmHg (n = 3) had the lowest baseline FEV1, the highest elevation in HR (ΔHR > 40 b/min) and reported higher post-walk perceived dyspnea scores. EIH was not observed in our pilot patient sample.

Conclusions: In this pilot study, an increase in $TcPCO_2$ during 6MWT was observed in all recruited COPD patients with CHRF regardless of supplemental oxygen flow rate used, but not sufficient to cause EIH. NIV may have a protective effect against EIH in very severe COPD, although this subject needs further investigation.

***Key words**: COPD. 6MWT. Exercise-induced hypercapnia. Non-invasive ventilation.*

CO 057. ROLE OF EOSINOPHILS IN THE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Introduction: The role of eosinophils in Chronic Obstructive Pulmonary Disease (COPD), particularly in exacerbations, has been the subject of intense discussion. According to most studies, about 10% to 25% of patients with COPD have eosinophilic airway inflammation, and the identification of these patients and its implications in clinical practice are important aspects to consider.

Objectives: The authors retrospectively analyzed COPD exacerbations in patients who used the Emergency Department (ER) of the Centro Hospitalar Lisboa Ocidental (CHLO), in order to analyze and interpret the data regarding peripheral blood eosinophils and its role in exacerbations

Methods: A retrospective study was carried out in patients with COPD exacerbation that went to the ER of CHLO from June 2015 to

December 2016. Data on the number of eosinophils and percentage in peripheral blood at admission were analyzed, assuming a cut-off of ≥ 200/uL or ≥ 2% eosinophils according to GOLD 2017. Analyzed demographic characteristics of the patients, pO2 value (cut-off ≤ 60 mmHg) and pCO2 value (cut-off ≥ 50 mmHg) at admission, C-reactive protein (CRP) < 5 mg/dL, hospitalization rate and readmission rate at 30 days. Statistical analysis was performed using SPSS IBM v.25 and Microsoft Excel 2013.
Results: Total of 250 patients, mean age of 68.6 ± 10.7 years, 67% of males. 56 (22.4%) had ≥ 200 uL or ≥ 2% eosinophils in the peripheral blood. It was verified that in the group with eosinophils superior to the cut-off used, the majority (82.5%) had CRP < 5 mg/dl (p = 0.014) and had a higher rate of readmission to the ED in 30 days (38.1% vs 25%, p = 0.029), these differences being statistically significant compared to the other group. There were no statistically significant differences between the two groups relative to pO2 value (in the group with eosinophils higher than cut-off 32.1% presented pO2 ≤ 60 mmHg vs 38% in the other group, p = 0.39) and pCO2 value (in the group with eosinophils higher than cut-off 16% had pCO2 ≥ 50 mmHg vs 18.6% in the other group, p = 0.77) or in the hospitalization rate (17.9% in the eosinophilic group superior to the cut-off used vs 15.9%, p = 0.78).
Conclusions: More than 20% of COPD exacerbations that have relied on the US presented eosinophils superior to the cut-off used, which reinforces their importance in exacerbations. Evaluating the role of eosinophils in this group we observed that these patients present predominantly non-infectious exacerbations with CRP values below 5 mg/dL, as well as a higher readmission rate to the ED in 30 days, reinforcing the relevance of eosinophils in the patient's profile exacerbating These differences emphasize the role of anti-inflammatories in maintenance therapy and in the exacerbation of patients with COPD.

Key words: *Chronic obstrutctive pulmoanry disease. Exacerbations. Eosinophils.*

CO 058. EVALUATION OF THE IMPLEMENTATION OF SPIROMETRY NETWORK IN ALGARVE REGION

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Introduction: The prevalence of Chronic Obstructive Pulmonary Disease (COPD) in Portugal is 14.2%, according to the BOLD study. Due to the high underestimation, valued in about 86.8%, the implementation of a spirometric network appeared as essential in the diagnostic panorama of this pathology. In Algarve region, the absolute value of diagnoses of COPD confirmed by spirometry was extremely low (< 1% of the population), showing noncompliance with the Clinical Guidelines for COPD, document that supports that spirometry it's essential for diagnose. The priorities established in the Local Health Profiles are to reduce tobacco consumption and consequently, COPD morbidity and mortality from respiratory diseases. The spirometry network in primary health care aims to simplify the access to this resource, and to achieve COPD early diagnosis, improving it´s treatment and prognosis. The conditions for espirometry execution are, age 40 or above, and at least one of the following criteria: current or past history of smoking; Occupational activity of respiratory risk; Respiratory symptoms, namely cough with or without expectoration or dyspnea.
Objectives: To explore the spirometric results obtained from January 2017 to June 2018 in the Algarve region, and thus to study the prevalence of COPD and other pathological spirometric patterns in the population, and its relation with smoking, age, gender and health center.
Methods: Observational, descriptive study. Population: total of patients submitted to spirometry from January 2017 to June 2018 (inclusive). Spirometry was performed in all three clusters of health centers in the Algarve region (Sotavento, Barlavento and Central) by three different cardiopneumology technicians. Variables: spirometry result, classified as: normal, with pathological alterations (obstructive, restrictive and mixed pattern). Data collected from the Database of Cardiopneumology Technicians and analyzed with Microsoft Excel®.
Results: Of the population covered by Primary Health Care in Algarve (466,323 enrolled), 3,804 patients were submitted to spirometry. Through this project, 1,295 patients with pathological spirometric alterations were identified (34% of the total). Out of these, 864 patients had an obstructive pattern (of which 306 COPD), 331 had a restrictive pattern and 100 had a mixed pattern. A total of 131 patients of the Central clusters of health centers were diagnosed with COPD, 76 patients of Barlavento and 99 patients of Sotavento.
Conclusions: This project emphasizes the greater accessibility of patients to spirometry, wich allowed a greater number of diagnoses, especially COPD (representing 33.9% of altered spirometry), and thus an improvement of quality in Health Care. Regarding the study limitations, it should be noted that spirometry are performed by different technicians and described by different pulmonologists; also, the database it's not homogeneous among the different regions. In addition, several patients with respiratory pathology are already followed at hospital.

Key words: *Algarve Spirometry Network. Chronic obstructive pulmonary disease. Spirometry.*

CO 059. DISCORDANCES IN THE DIAGNOSIS AND TREATMENT OF PATIENTS WITH COPD WHEN USING DIFFERENT TOOLS

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Objectives: To evaluate how the criteria defining airflow limitation, the questionnaires used in symptoms evaluation and the GOLD ABCD assessment tool version can influence medical decision in COPD patients.
Methods: We conducted a post-hoc analysis of a cross-sectional study on COPD patients diagnosed according to GOLD criteria and recruited consecutively in the ambulatory pulmonary clinic of Hospital de Guimarães, between March 2016 and May 2017. Evaluation of symptoms was done using the COPD Assessment Test (CAT) and the Medical Research Council Dyspnea (mMRC) questionnaires. The number of acute exacerbations (ECOPD) referred in the previous year was evaluated. Spirometries were performed according to ERS/ATS criteria, and referenced according to the Global Lung Function Initiative prediction equations (GLI 2012). A statistical analysis was then performed with IBM SPSS Statistics for Windows.
Results: 46 (15.2%) out 303 patients had FEV_1/FVC > lower limit of normal (LLN 5%, Z-score -1.64). They were significantly less symptomatic, less frequent exacerbators and the mean FEV_1% was significantly higher. According to GOLD guideline they have a milder form of COPD, but when using the LLN criteria to define airflow limitation, COPD would be ruled out, and pharmacologic treatment could be significantly different. 207 patients (68.3%) responded to both CAT and mMRC questionnaires. In this sub-group of patients, and using the GOLD proposed cut-points to consider more breathlessness or more symptomatic impact that needs regular treatment, discordance was found in 44 (21.2%) patients, 15.9% in low-risk A and B categories and 5.3% in C and D high-risk categories. Using different validated questionnaires, some patients move between groups, deserving different pharmacologic therapy. During the period of patients' recruitment, a refinement of the ABCD assessment tool was proposed in the 2017

GOLD Report, and the distribution of patients was 23.1%, 39.6%, 2.3% and 35% from A to D groups. However, using the previous GOLD version, the distribution of patients was 16.8%, 21.8%, 7.6% and 53.8% from A to D. Discordance was obtained in 24.1% of patients, with significant differences in the proposed pharmacologic treatment algorithm and management strategies.
Conclusions: Medical decision and pharmacologic treatment can be significantly different when using different validated tools, as are standardised questionnaires or clinical guidelines.

Key words: *COPD. Tools. Medical decision.*

CO 060. HIGH-FLOW NASAL CANNULA: EXPERIENCE OF AN INTENSIVE CARE UNIT

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Introduction: High-flow nasal cannula oxygen (HFNC) is an increasingly used therapy allowing elevated flows and fractions of inspired oxygen (FiO_2) within more physiological levels of temperature and humidity, providing also a dead space wash-out and tele-expiratory positive airway pressure.
Objectives: Analysis of HFNC experience in acute respiratory failure in a respiratory intensive care unit (ICU).
Methods: Retrospective study including all patients who underwent HFNC in Centro Hospitalar Lisboa Norte - Pulido Valente Hospital ICU between January 2014 and April 2018.
Results: There were included 43 patients (70% male); mean age of 60.8 ± 19.7 years. Pneumonia was the main admission cause (58.1%), followed by pulmonary hypertension (16.3%). Interstitial lung disease (ILD), chronic heart failure and emphysema were the most common comorbidities (32.6%, 23.3% and 20.9%, respectively). Mean HFNC usage was 7.6 ± 5.9 days; mean flow 45L/min and mean FiO_2 99%. In 25 (58.1%) patients, HFNC was alternated with non-invasive ventilation (NIV). Mean paO_2/FiO_2 ratios were higher at the end of treatment (100.9 mmHg vs 120.7 mmHg), although the difference was not statistically significant (p = 0.128); a significant increase in $paCO_2$ was observed (40.7 mmHg vs 47.3 mmHg, p = 0.011). Three patients (7.0%) discontinued therapy due to discomfort. HFNC success was obtained in 68% of pneumonias (n = 17). Twelve patients (27.9%) had an established therapeutic ceiling; HFNC failure, defined as intubation and/or death, occurred in 21 (48.8%) patients, with 19 deaths (44.2%). No differences in TISS28, SOFA and APACHE scores were found among HFNC-success and failure groups.
Conclusions: In our sample, HFNC was globally well tolerated, either continuously or alternately with NIV. Its efficacy was higher in pneumonia, where intubation was avoided in most cases.

Key words: *High-flow nasal cannula oxygen. Acute respiratory failure.*

CO 061. INSTANTANEOUS AIRWAY RESISTANCE: EVALUATION AFTER WEIGHT LOSS THROUGH BARIATRIC SURGERY

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Introduction: Obesity compromises lung function, particularly lung volumes. However, it is still relatively unknown whether the impact on airway resistance (Raw) is a consequence of these changes in lung volumes or an independent pathophysiological process.
Objectives: Evaluate the effects of weight loss after bariatric surgery in the various resistances throughout the respiratory cycle.
Methods: A retrospective study which included individuals over 18 years old who underwent bariatric surgery between 2008 and 2017 and underwent lung function tests before and after weight loss. In the plethysmography, the parameters of instantaneous Raw were collected in addition to the volumetric and classic Raw parameters: maximum and mean expiratory resistance (RexMax, RexMean); maximal, mean and minimum inspiratory resistance (RinMax, RinMean, RinMin); difference between mean expiratory and inspiratory resistance (dR); area of the loop; peak-to-peak value (PtP); resistance at the maximum expiratory flow (REF); maximal inspiratory flow resistance (RIF); slope of the linear regression from start of expiration to RexMax (SBE) and from the start of inspiration to RinMax (SBI). In statistical analysis was performed the Wilcoxon non-parametric test to compare parameters before and after the weight loss.
Results: Of the 21 subjects included, the mean preoperative age was 45.24 ± 12.49 years, 16 were female, with a BMI of 41.98 ± 4.82 kg/m^2. After the intervention, the mean BMI was 34.41 ± 4.31 kg/m^2. Table 1 summarizes the lung function parameters means, before and after intervention and table 2 the parameters means related to

Table 1 CO 061

	FEV_1 (L BTPS)	VC (L BTPS)	PEF ($L.s^{-1}$ BTPS)	TLC (L BTPS)	IC (L BTPS)	ITGV (L BTPS)	ERV (L BTPS)	RV (L BTPS)	RV/TLC (%)
Pre	2.43	3.07	6.67	4.90	2.25	2.63	0.80	1.83	37.19
Pos	2.60	3.22	6.46	5.05	2.25	2.80	0.97	1.84	36.05
p value	0.016	0.006	0.651	0.054	0.808	0.130	0.063	0.862	0.244

Table 2 CO 061

	RexMax (kPa.s/L)	RexMean (kPa.s/L)	RinMax (kPa.s/L)	RinMean (kPa.s/L)	RinMin (kPa.s/L)	dR (kPa.s/L)	Area (kPa.s)	PtP (kPa.s/L)	REF (kPa.s/L)	RIF (kPa.s/L)	SBE	SBI
Pre	0.56	0.52	0.48	0.46	0.41	0.07	0.018	0.15	0.48	0.49	0.68	0.15
Pos	0.46	0.43	0.43	0.40	0.36	0.03	0.007	0.09	0.42	0.43	0.38	0.26
p value	0.082	0.085	0.357	0.289	0.204	0.020	0.025	0.113	0.255	0.266	0.305	0.958

the variation of Raw throughout the respiratory cycle. There were statistically significant differences between the evaluation before and after surgical intervention in FEV1 (p = 0.016), VC (p = 0.006), dR (p = 0.020) and area of the loop (p = 0.025). Although there was no statistically significant difference, it was observed important variations in some parameters, such as ERV (+ 21.28%), sGaw (+ 24.3%), RexMax (-22.0%), RexMean -20.35%), PtP (-61.21%), SBE (-97.4%) and SBI (+ 57.7%).

Conclusions: This sample analysis allowed to verify that after the weight loss some parameters of the intra-cycle resistance decreased significantly, indicating that the increase of the resistance in obese patients occurs due to a pathophysiological process and not only by variation of the pulmonary volumes.

Key words: *Airway resistance. Plethysmography. Obesity.*

CO 062. FETAL TISSUE MACROPHAGES AS KEY PLAYERS IN LUNG MORPHOGENESIS

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In preterm births, pulmonary immaturity is frequently associated with respiratory distress, and consequently, bronchopulmonary dysplasia. Glucocorticoids administration improves lung maturation, but several developmental impairments, as in nervous system, has been recently documented. Thus, new therapeutic approaches are required to improve health and life quality of premature newborns. In this way, it is imperative to understand the cellular and molecular mechanisms of lung differentiation and maturation. Lung development is sub-divided in five stages named embryonic, pseudoglandular, canalicular, saccular and alveolar. In the last three phases, epithelial and vascular differentiations are crucial processes in lung complete maturation to perform its main function: breath. In the last years, fetal tissue-macrophages (FTM) have been demonstrated as crucial players in morphogenesis of several organ or systems, namely in kidney, pancreas, brain, bone and vasculature. In lung, it has been described the presence of this population since the beginning of its development (embryonic day (E) 8-9). However, little is known about FTM contribution for lung morphogenesis. To assess FTM functions on lung formation, we used a tissue macrophages-deficient mouse model (*colony stimulating growth factor-1 receptor* (*Csf1r*) knockout (KO) mice). Histological and stereological analysis on HE stained lung sections showed impairment in distal lung morphology in *Csf1r* KO animals, with increased non-epithelial and decreased air space volumes during saccular stage (E18.5 and postnatal day (P) 0). Since, lung saccular stage is largely characterized by differentiation of several cell lineages (e.g. alveolar epithelial, myofibroblasts) with the continuous vascular network formation, next we evaluated distal epithelium, myofibroblasts/smooth muscle and vasculature differentiation, by transcriptional and

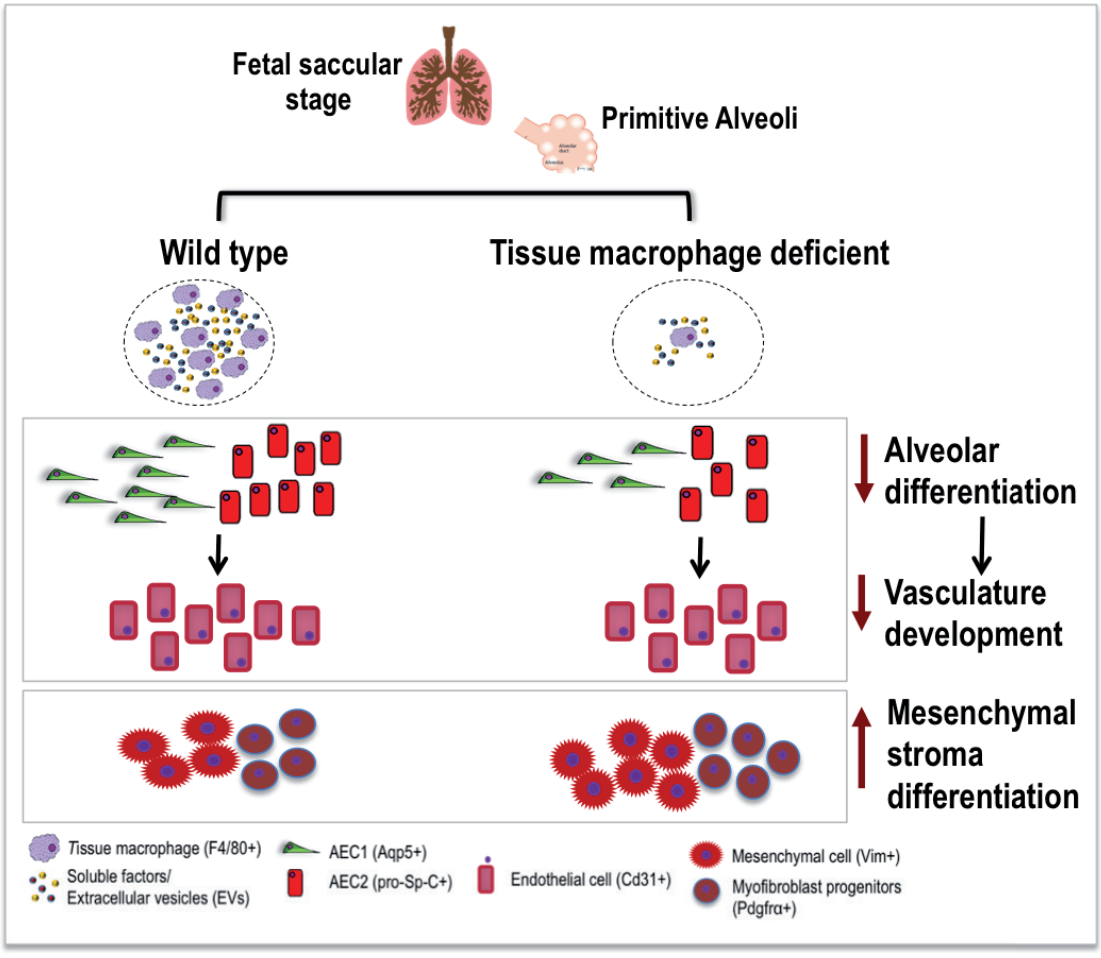

Figure CO 062

immunofluorescence analysis. In *Csf1r* KO lungs at E18.5 and P0, it was observed a decrease in epithelial differentiation of alveolar epithelial cells type I (Aquaporin-5 + cells) and II (Surfactant protein-C + cells). On the other hand, vasculature impairments were found only in late saccular stage (P0). In the mesenchymal compartment of *Csf1r* KO lungs at E18.5, it was detected an increase in expression of vimentin, a marker of mesenchymal-derived cells, and of platelet derived growth factor receptor alpha (Pdgfrα), a marker of myofibroblast progenitor cells. Flow cytometry analysis showed that *Csf1r* KO mouse lungs presented 90% reduction in FTM population. Altogether, these data suggest that fetal tissue macrophages deficiency across lung development compromises alveolar epithelial and mesenchymal/stromal differentiation, with consequent vasculature impairments. Thus, we disclose for the first time a role of fetal tissue macrophages in lung morphogenesis, which prompt us to propose them as potential candidates for new therapeutic strategies that potentiate lung maturity in preterm birth.

***Key words**: Tissue macrophages. Bronchopulmonary dysplasia. Lung development.*

CO 063. EXERCISE CAPACITY IN SARCOIDOSIS

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Introduction: Sarcoidosis is a systemic, granulomatous disease. Pulmonary involvement is the most frequent manifestation. Variable natural history, corticosteroid toxicity, discrepancy between clinical and imaging findings and pulmonary function in many situations, controversy over treatment. Cardiopulmonary Exercise Testing (CPET) seems to be useful in identifying a possible intolerance to exercise and the pathophysiological mechanism involved.
Objectives: Evaluation and characterization of a group of patients with pulmonary Sarcoidosis through CPET.
Methods: Retrospective analysis of pulmonary Sarcoidosis patients who performed incremental CPET on cycle ergometer at the Pulmonology Department of General Hospital (CHUC) from January 2008 to June 2018. Analysis included demographic and clinical data, radiologic stage, lung function tests and CPET.
Results: Thirty-five patients, 22 (62.9%) of whom were female, with a mean age 43.06 ± 12.53 years were included. Twenty-four (68.6%) were non-smokers, 9 (25.7%) had smoking habits and 2 (5.7%) were former smokers. Seven patients (20.0%) were in stage I of the disease, 13 (37.1%) in stage II, 9 (25.7%) in stage III and 6 (17.1%) in stage IV. Twelve (34.3%) were asymptomatic and 23 (65.7%) were symptomatic. Twenty-one (60%) under steroid therapy or had already completed. With no significant changes in lung function, only the decrease in residual volume (RV) (61.23% ± 19.06) in stage IV patients is noted. No change in gas exchange at rest in all patients. All of them did incremental CPET on cycle ergometer. Only 3 patients discontinued early due to hypertensive response. The exercise capacity (maximum oxygen consumption - VO2 max) was normal in 2 patients, 1 of stage I and another of stage II. The remaining 33 patients had decreased exercise capacity (VO2 max < 84% of predicted). The mean VO2 max in each stage was: I - 66.83 ± 9.83; II = 61.42 ± 8.41; III = 63.22 ± 16.70; IV - 65.83 ± 8.77 (without statistically significant difference between stages, p = 0.57). The causes of exercise limitation were: a) change in gas exchange in 4 (12.1%) (by desaturation); b) ventilatory alterations translated by dynamic hyperinflation in 6 (18.2%) patients; c) cardiovascular alterations with ventricular extrasystoles during exercise in 3 (9.1%) patients. In the other cases, exercise limitation was attributed to physical deconditioning.
Conclusions: The results of this study show the predominant role of CPET in the evaluation of patients with sarcoidosis, since it allowed to identify alterations that were not perceptible in the resting exams, suggesting that the limitation to exercise due to changes in gas, ventilatory or cardiovascular changes arises in these patients, even in the early stages of the disease.

***Key words**: Cardiopulmonary exercise testing. Pulmonary function tests. Sarcoidosis.*

CO 064. NOTIFICATION OF RISK CLINICAL SITUATIONS IN A RESPIRATORY FUNCTION LABORATORY

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Introduction: In a respiratory function laboratory, patients are evaluated in a stable phase but often with multiple co-morbidities that can be decompensated. The need arose to create an alert protocol for the technicians that perform the tests of the clinical situations that need medical evaluation. We have thus established a severity-stratified warning system based on gasometrical results and vital signs which was implemented in 2015, with records made in all of these situations.
Objectives: To evaluate the results of the respiratory function laboratory alert system.
Methods: Retrospective analysis of notifications from January 2015 to June 2018 based on consultation of clinical files.
Results: 139 clinical situations of risk were reported. Of the patients reported, 67.6% were men, with a mean age of 67.6 years (± 13). Of the reported cases, 44.6% of the patients needed to be referred for emergency department for further evaluation and 12.2% needed hospital admission.

Table 1. Co-morbidities

Co-morbidities	Frequency
Hypertension	64.7%
COPD	49.6%
Heart failure	47.5%
Diabetes mellitus	43.9%
Dyslipidemia	40.3%
Chronic renal disease	20.1%
Osa	17.3%

Table 2. Causes for notifications

Notifications	Frequency
PO2 < 54 mmHg	28.1%
sato2 < 88%	15.1%
pH < 7,33	10.8%
Lact > 4,5 mmol/L	9.4%
K > 5,5 mmol/L	7.9%
Hb < 8 g/dl	7.9%
Sistolic bp > 200 mmHg or diastolic bp > 100 Mmhg	6.5%
pH > 7,55	4.3%
hr > 130 bpm	4.3%
GLIC > 400 mg/dl	4.3%
k < 2,8 mmol/L	3.6%

Conclusions: There are clinical situations that require medical evaluation and their correct and timely identification is essential. To establish alert status recognition protocols is a good practice for any respiratory function laboratory

***Key words**: Respiratory function. Risk. Notification.*

CO 065. THE EFFECTS OF OBESITY ON RESPIRATORY FUNCTION: LOOK BEYOND SPIROMETRY

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Introduction: Obese individuals (body mass index (BMI) > 30 kg/m^2) often present with respiratory symptoms (dyspnea, wheezing) even in the absence of any known respiratory disease.
Objectives: To describe and determine the most common ventilatory pattern in a population of obese individuals and to evaluate the effects of BMI on lung volumes.
Methods: Descriptive analysis of the respiratory function tests (RFT) of obese individuals referenced to the Laboratory of Respiratory Function by the Obesity Consultation during 12 months; the statistical treatment of the data was done through the IBM® SPSS® Statistics Version 24.
Results: A total of 115 patients with a mean age of 45.3 (± 10.2) years, predominantly female (n = 94, 81.7%) and mean BMI of 42.7 (± 6.1) kg/m^2. More than half of the subjects were non-smokers (n = 68, 59.1%); no patient had known respiratory disease. In 34 patients it was not possible to perform plethysmography, having only done spirometry. The descriptive analysis of some pulmonary volumes is shown in table 1. Regarding the ventilatory patterns: there was an increase in pulmonary resistance in 72% (n = 58); decrease in ERV (%) in 62% (n = 50); obstructive pattern with predominance of small airways in 40% (n = 46); restrictive pattern in 19% (n = 15); pulmonary insufflation in 13.5% (n = 11); mixed pattern at 2.5% (n = 2). There were 24 (21%) individuals with normal RFT. A correlation analysis was performed between BMI and different lung volumes. The results are described in table 2.

Table 1. Median and minimum and maximum interval of lung volumes and pulmonary resistance

	n	Median	Min-Max
ERV (%)	81	56	9-163
FEV1/FVC (%)	115	80.1	58.6-92.4
MMEF 75/25 ((%)	115	74	20-134
TLC (%)	81	103	69-133
ITGV (%)	81	83	53-144
RV ((%)	81	97	49-185
Rtot (%)	81	154	72-318

ERV: expiratory reserve volume; FVC: forced vital capacity; FEV1: forced expiratory volume in the 1st second; MMEF: mean expiratory flow rate; TLC: total lung capacity; ITGV: intrathoracic gas volume; RV: residual volume; Rtot: total resistance.

Table 2. Correlation analysis (Spearman test) between BMI and different lung volumes and pulmonary resistance

n	Lung volumes	BMI (kg/m^2)
81	ERV (%)	p = 0.111
115	MMEF 75/25 (%)	p = 0.006
81	TLC (%)	p = 0.052
81	ITGV (%)	p = 0.013
81	RV (%)	p = 0.334
81	Rtot (%)	p = 0.006

Statistical significance for p value < 0.05.

Conclusions: In this sample of individuals, with a mean BMI > 40 kg/m^2 (class III), the most common ventilatory alteration was increased pulmonary resistance and decreased ERV. There was a moderate positive correlation between BMI and pulmonary resistance and an inverse correlation between BMI and MMEF 75/25 and ITGV (p < 0.05).

Key words: *Obesity. Lung function. Plethysmography.*

CO 066. THE INFLUENCE OF THE REFERENCE VALUES ON THE INTERPRETATION OF SPIROMETRY IN AFRO-DESCENDANTS

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Introduction: The Evaluation of respiratory function is fundamental in the diagnosis and follow-up of respiratory pathology and the interpretation depends on the use of reference equations adjusted to the study population. In Europe, the most commonly used reference equations are the European Coal and Steel Community (ECSC), obtained from Caucasian individuals. In 2012 new reference values were developed, with the inclusion of various ethnic groups by the Global Lung Function Initiative, but their influence on spirometry interpretation in afro-descendants, has not been widely evaluated.
Objectives: To compare the interpretation of spirometry using GLI-2012 vs ECSC reference values.
Methods: Cross-sectional study on a sample of 130 participants, aged over 18 years old and afro-descendants. Spirometry was performed according to the recommendations of the American Thoracic Society/European Respiratory Society (ATS/ERS), in pharmacies located in several districts of Portugal and in two nonprofit organisations between January and March 2018. The spirometry parameters evaluated were: forced vital capacity (FVC), peak expiratory volume in first second (FEV1) and the FEV1/FVC ratio. For the classification of the ventilatory pattern, the 5th percentile was used as the lower limit of normality (LLN). Airway obstruction was defined as FEV1/FVC < LLN while suspected restrictive ventilatory pattern as FVC < LLN and FEV1/FVC > LLN. Statistical analysis was performed using software IBM®, SPSS Statistics®, version 22 and R.
Results: The findings were that FEV1 and FVC expressed as GLI-2012 or ECSC LLN differed significantly (p < 0.05). The mean FEV1 LLN was 2.2 ± 0.52 L vs 2.5 ± 0.66 L and the mean FVC LLN was 2.7 ± 0.63 vs 3.0 ± 0.80 L for GLI-2012 and ECSC, respectively. Obstructive and suspected restrictive ventilatory patterns were observed in 6.1% and 1.5% Afro-descendants using GLI-2012 values compared with 5.4 and 4.6% when using ECSC reference values, respectively.
Conclusions: GLI-2012 reference values for Afro-descendants population appears to increases the number of Obstructive ventilatory patterns and decrease the suspected restrictive ventilatory pattern, compared with ECSC reference values. The reference equations adjusted for each population represent a decrease in the false positives and/or false negatives.

Key words: *Spirometry. Reference equation. Interpretation. Afro-descendants.*

CO 067. NORMAL LOCAL VALUES: SHOULD BE INCLUDED IN THE QUALITY CONTROL OF PULMONARY FUNCTION LABORATORIES?

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The interpretation of the functional values obtained by spirometry depends on the comparison of these values with reference or predicted values. These reference values derive from equations estimated from a sample of individuals considered normal. This normality is related with characteristics of each population and probably to the time when these values of normality were obtained. The most

commonly used reference equations in Europe were established by the European Community for Coal and Steel (ECCS) in 1983. It is important to note whether these reference equations reflect or still reflect the normality of the Portuguese population. It is intended to compare the FVC and FEV1 observed in a healthy and non-smoking population of Vila Franca de Xira (VFX) with those predicted by the reference equations of the ECCS. In Vila Franca de Xira (VFX) we collected between May 14 and August 4, 2016 a sample of 64 adult volunteers (44 women), ages 26-82 years, non-smokers, without symptoms and respiratory pathology and compared it with the the ECCS. T-test for paired samples was used to make this comparison. A significance level of 5% was considered. We found significant differences in women, overestimating FVC (3.29 ± 0.523) in 336 ml and underestimating FEV1 (2.76 ± 0.567) in 182 ml. In men, FVC underestimated (4.55 ± 0.948) in 124 ml and FEV1 (3.71 ± 0.779) in 82ml, but without statistical significance. We conclude that the ECCS equations may not be adjusted for the women of our population, that if true may have important clinical implications, such as the underdiagnosis of COPD in women.The question that remains is whether the updated knowledge of the normal spirometric values of each population should be included in the quality control of Pulmonary Function Laboratories.

Key words: *Spirometry. Reference values. Predicted values. Reference equations. ECCS.*

CO 068. SURGICAL LUNG BIOPSY FOR THE DIAGNOSIS OF INTERSTITIAL LUNG DISEASE: A 5- YEAR RETROSPECTIVE STUDY

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Surgical lung biopsy has become an increasingly accepted approach for the diagnosis of patients with diffuse interstitial lung disease when less-invasive diagnostic methods have been unsuccessful. The present study aimed to assess the diagnostic yield and safety of surgical lung biopsy on the diagnosis of ILD. We performed a retrospective study of 90 cases with suspicion of ILD undergoing surgical lung biopsy in Thoracic Surgery Department between 2013 and 2017. 55% of these were female, with a mean age of 57.2 years. 58% of patients were smokers or former smokers and 38% had history of environmental exposure to organic and inorganic compounds. A total of 86 patients underwent VATS and 4 patients underwent surgical lung biopsy by open lung thoracotomy. The annual number of biopsies increased until 2015, and decreased after that period until 2017, with a mean number of 18 biopsies per year. The diagnostic yield of surgical biopsies was 84%, being the pathological features of chronic hypersensitivity pneumonitis and usual intersticial pneumonia (UIP) the most common The median length of hospital stay was 4.1 days. The most common complications were prolonged air leaks (5 patients) and hemothorax (1 patient) without the need of surgical revision. No patients needed an intervention to control bleeding, and there were no cases with persistent fever or pneumonia/empyema. With regard to early deaths, there wasn't any in-hospital mortality; 30-days mortality was 1% due to massive pneumothorax with acute respiratory failure.

Key words: *Surgical lung biopsy. Interstitial lung disease. Diagnostic yield. Complications.*

CO 069. CYCLOPHOSPHAMIDE IN SEVERE INTERSTITIAL FIBROTIC LUNG DISEASES - EFFICACY AND SIDE EFFECTS

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Introduction: Treatment of unclassifiable idiopathic interstitial pneumonias (IIP) is based on disease behavior and most likely diagnosis. Corticosteroids are usually the first therapeutic choice. Cyclophosphamide (CFF) is a drug commonly used in interstitial lung diseases associated with connective tissue disease, particularly in systemic sclerosis, where there is more evidence of its efficacy. Treatment of interstitial pneumonia with autoimmune characteristics (IPAF) is not standardized, and immunomodulatory therapies are frequently used. These are also used in chronic hypersensitivity pneumonitis (cHP) that does not respond or requires long periods of corticosteroid therapy, and the use of drugs that condition marked immunosuppression such as CFF is sometimes necessary in case of rapidly progressive disease.
Objectives: To evaluate patients with unclassifiable IIP, IPAF and cHP, who, due to their severity, underwent treatment with CFF. Respiratory function parameters (before and after CFF) and complications during therapy were evaluated.
Methods: Retrospective analysis of patients with unclassifiable IIP, IPAF and cHP who were treated with intravenous CFF pulse therapy from 01.2013 to 07.2018. The analysis of FVC and DLCO was performed with data from before and after the onset of CFF.
Results: We included 14 patients, 8 of whom were women (57.1%), with a mean age of 67.4 ± 9.5 years. Six patients (42.9%) had cHP, 3 (21.4%) IPAF and 5 (35.7%) unclassifiable IIP. The mean FVC and DLCO at the onset of CFF was 64.3 ± 8.9% and 38.8 ± 14.1%, respectively. Ten patients (71.4%) were under supplemental oxygen. CFF was used as the first therapeutic option in 6 cases (46.2%). Three patients (21.4%) performed only 2 cycles of CFF, 4 (28.6%) did 5 cycles and 7 (50%) 6 cycles. Eight patients (57.1%) were receiving a prophylactic dose of cotrimoxazole. Eleven patients (78.6%) had infections (urinary and/or respiratory) during therapy, 4 of them (28.6%) requiring hospital admission. Of the admitted patients 3 died (1 with IPAF with 6 cycles of treatment and 2 with cHP with only 2 cycles), with a calculated mortality rate during CFF of 21.4%. At the time of this review 9 patients had died (64.3%): in addition to the 3 patients who died during treatment with CFF, another patient with unclassifiable IIP died 2 months after the end of treatment; the remaining 5 patients died at least 1 year after stopping therapy (12 to 24 months). There were no significant differences in FVC and DLCO before treatment initiation and after 3 to 6 months in the 11 patients with functional reassessment (64.2% vs 62.9%, p = 0.673 and 38.9% vs 37.7%%, p = 0.812 respectively). This stability was also observed at 12 months of treatment, both in FVC (64.5%, p = 0.895) and in DLCO (32.9%, p = 0.571).
Conclusions: In our sample of patients with unclassifiable IIP, IPAF and cHP, CFF allowed the achievement of functional stability. A high mortality rate was observed during the course of this therapy, which is expected given the severity of the disease, and is in line with other studies, where about half of patients treated with CFF experience disease progression or death.

Key words: *Cyclophosphamide. Unclassifiable idiopathic interstitial pneumonias. Interstitial pneumonia with autoimmune characteristics. Chronic hypersensitivity pneumonitis.*

CO 070. QUANTIFICATION OF SPECIFIC IGG AGAINST AVIAN AND FUNGAL ANTIGEN MIXTURES AS EXPOSURE MARKERS IN HYPERSENSITIVITY PNEUMONITIS

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Introduction: Hypersensitivity pneumonitis (HP) is a granulomatous diffuse lung disorder. More than 300 antigens, associated with a

wide range of occupations and exposures, have been described to cause and sensitize patients with HP, including antigens (atgs) from molds, birds and plants.
Objectives: To compare levels of serum specific IgG (sIgG), using an automated fluoro-enzyme-immunoassay, in patients with diffuse lung diseases with and without exposure to birds and/or molds.
Methods: Nineteen patients with HP and fifteen patients with Idiopathic Pulmonary Fibrosis (IPF) were included – among patients with HP, 15 referred chronic/past exposure to birds, while 8 had been exposed to moldy environments. All patients were diagnosed by a multidisciplinary approach, blinded to sIgG results. We assessed by the CAP-FEIA (ImmunoCAP100) Phadia® serum sIgG levels to: 1) avian atgs - including pigeon feathers (e215), pigeon serum proteins (Ge93), poultry feathers mix (ex71), cage birds feathers mix (ex72); 2) fungal atgs – namely, an indoor molds mix (Gmx6 - *Penicillium chrysogenum* (m1), *Cladosporium herbarum* (m2), *Mucor racemosus* (m4), *Alternaria alternata* (m6)), a farm molds mix (Gmx7 - *Thermoactinomyces vulgaris* (Gm23) and *Micropolyspora faeni* (Gm22)) and *Penicillum glabrum* (m209). sIgG levels to avian atgs were compared among patients with HP and chronic bird exposure ("bird fanciers") *versus* all the remaining patients. For molds, the respective sIgG levels were compared among patients with HP and mold exposure *versus* the remainder. For each antigen specificity of the quantified IgG, the respective Receiver Operating Characteristic (ROC) curve was obtained, assessing the ability of avian sIgG to discriminate between "bird fanciers" and the remainder, and of molds sIgG to discriminate between "mold exposed patients" and the remainder.
Results: We assessed a total of 34 patients, most of them male (*n* = 18; 52.9%), and with a mean age of 62.7 years (SD = 11.8). "Birds fancier" patients presented significantly higher median titers of serum sIgG levels against pigeon feathers, pigeon serum proteins and poultry feathers mix. Among the compared antibody specificities, pigeon feathers showed the highest area under the ROC curve (AUC-ROC) for discriminating "bird fanciers" *versus* the remaining (AUC = 0.732; 95%CI: 0.536-0.927; p = 0.022); a titer > 2.6 mgA/L was found to have 80% sensitivity, while 100% specificity was obtained with titers > 9.8 mgA/L. Pigeon serum proteins sIgG had an AUC-ROC of 0.704 (95%CI: 0.509-0.898; *p* = 0.044), with a 100% specificity obtained with the a cutoff point of 10.2 mgA/L. For poultry feathers sIgG, the AUC-ROC was of 0.706 (95%CI: 0.514-0.897; p = 0.047) – titers > 7.7 mgA/L present with a sensitivity of 80%, while values > 31.6 mgA/L associate with a specificity of 100%. No significant differences were found concerning the levels of tested sIgG against the different mold mixtures between exposed and unexposed patients.
Conclusions: In patients with diffuse lung diseases, quantification of serum specific IgG against the tested avian antigens, by an automated fluoro-enzyme-immunoassay, is a feasible method to discriminate avian antigen exposure and sensitization.

Key words: *Antigens. Bird fanciers. Idiopathic pulmonary fibrosis. Hypersensitivity Pneumonitis. Molds. Specific IgG.*

CO 071. C-MET INHIBITION ATTENUATES PULMONARY FIBROSIS BY MODULATION OF INFLAMMATORY RECRUITMENT

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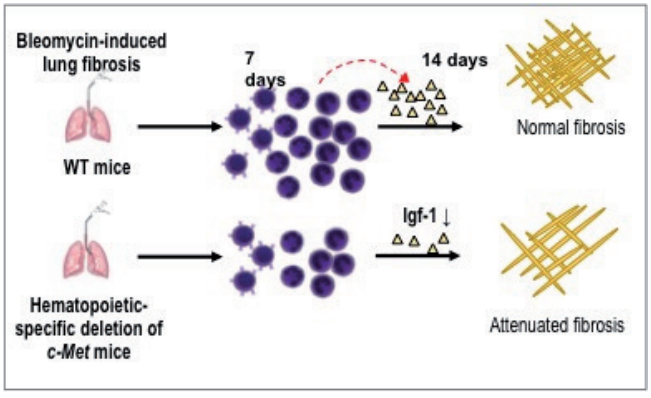
Pulmonary fibrosis (PF) is the end pathologic stage of several interstitial lung diseases, including usual interstitial pneumonia (UIP)/idiopathic PF (IPF) and other secondary clinical conditions, as hypersensitivity pneumonitis and connective tissue diseases. These diseases are associated with high morbidity and mortality rates. Currently no cure is available for PF, being the treatments used in clinical practice only capable of slow its progression. Chronic inflammation and neutrophils' accumulation predicts early mortality accompanied with high levels of neutrophil elastase, which act as key mediators of the tissue damage, promoting PF. Recently, hepatocyte growth factor receptor (c-Met) expression was demonstrated to be induced upon inflammatory stimuli and required for extravasation of neutrophil to inflamed tumours. Accordingly, we hypothesized that PF associated-inflammatory recruitment is attenuated in mice with *c-Met*-deleted immune cells, with subsequent ameliorated fibrosis progression and lung function preservation. In this way, a bleomycin (BLM)-induced model of lung fibrosis was used in a cell-specific transgenic (TG) mouse, in which *Tie2:Cre* transgene excises *c-Met*-floxed gene both in hematopoietic and endothelial cells. Survival analysis was assessed until day 21 after BLM administration, wherein TG mice exhibited increased survival and less weight loss compared to wild-type. Next, by day 14 we performed histological analysis of H&E stained-lung sections, as well as fibrotic lesion extension analysis and respective quantification on Masson's trichrome stained-lung sections through a fibrotic score criteria. TG mice presented significantly reduced fibrotic score, characterized by reduced alveolar destruction and extracellular matrix deposition. Moreover, collagen quantification using hydroxyproline assay, revealed diminished levels in TG mice lung, in accordance with the significant decrease of transcript' levels of collagen (*Col1a1 and Col1a2*), as well as a fibroblast marker (*S100a4*) and a profibrotic factor (*Igf-1*). At day 7 after administration, tissue cytotoxicity, assessed by lactate dehydrogenase assay, was reduced in TG mice. This comes in agreement with reduced inflammatory cells infiltration observed, specifically neutrophils and inflammatory macrophages, evaluated by flow cytometry. Moreover, TG mice presented an increase in transcript' levels of proinflammatory cytokines (*Tnf-*α*, IL-1*β*, IL-6* and *iNos*). Taken together, our findings show that *c-Met* deletion in immune cells attenuates PF progression, probably due to reduction of inflammatory cells in injured lung, specifically neutrophils and inflammatory macrophages, along with a pro-inflammatory environment in the inflammatory phase of disease, with subsequent controlled tissue repair and decreased production of profibrotic factors, as Igf-1, in the fibrotic stage, resulting in an attenuated fibrotic outcome. Finally, to understand whether c-Met inhibition is a valid and effective therapy, it would be important to clarify whether c-Met expression is induced in neutrophils and/or macrophages in UIP/IPF and/or secondary UIP patients. Afterward, once confirmed, cell-specific delivery of already available c-Met inhibitors could be tested in an animal model of PF. In conclusion, these findings are opening promising avenues for new therapeutic approaches for these patients.



Key words: *Usual interstitial pneumonia. Pulmonary fibrosis. Inflammation. Tissue repair.*

CO 072. PENTRAXIN-3 (PTX3) REGULATION OF INFLAMMATION IN SARCOIDOSIS

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Sarcoidosis is a systemic inflammatory disease of unknow etiology characterized by the presence of non-caseating granulomas, with lung involvement in almost all cases. Although the histological landscape of human sarcoid granulomas has been extensively studied, the genetic, molecular and inflammatory signatures underlying macrophage transformation into epithelioid cells that aggregate, initiate and sustain granulomatous inflammation remain elusive. Consequently, available treatment options are scarce and currently, there are no therapeutic approaches targeting sarcoidosis pathogenic mechanisms. Among the fluid-phase molecules with immunoregulatory properties, the long pentraxin-3 (PTX3) has been shown to play a pivotal role at the crossroads of innate immunity and inflammation. Herein, we developed an integrative translational approach to elucidate the PTX3-mediated mechanisms that control leukocyte recruitment and inflammation in sarcoidosis. By resorting to a murine model of granulomatous inflammation, we identified PTX3 as an integral component of sarcoid granulomas that is required to control leukocyte recruitment. More importantly, individuals carrying loss-of-function genetic variants in human PTX3 were found to have an increased risk of developing sarcoidosis. Accordingly, the genetic deficiency of PTX3 in these patients was characterized by a markedly increased leukocyte recruitment to the pulmonary microenvironment. These results reveal a previously unanticipated key role of PTX3 during granulomatous inflammation in sarcoidosis, pinpointing this protein as a promising immunotherapeutic target for effective medical interventions in sarcoidosis patients.

***Key words**: Pentraxin-3 (PTX3). Leukocyte recruitment. Granulomatous inflammation. Pulmonary Sarcoidosis.*

CO 073. INTERSTITIAL LUNG DISEASE MULTIDISCIPLINARY TEAM: PRIVATE HOSPITAL EXPERIENCE

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Introduction: Multidisciplinary approach is, nowadays, the gold standard for the diagnosis and management of patients with interstitial lung disease (ILD). This is a dynamic process that requires close communication between, at least, a clinician, a radiologist and, when appropriate, a pathologist. The Hospital da Luz Lisboa is a private hospital that, since November 2016, has an ILD multidisciplinary meeting. It includes a broad team that involves also a rheumatologist, an internal medicine physician (with expertise in autoimmune diseases) and thoracic surgeon. The ILD epidemiology in Portugal is unknown, but according to the international literature, ILD of unknown etiology as idiopathic pulmonary fibrosis (IPF) and sarcoidosis, are the most frequent pathologies.
Objectives: Characterize patients evaluated in ILD multidisciplinary meeting of Hospital da Luz Lisboa regarding demographic date, diagnosis approach and diagnosis.
Methods: A cohort study that included patients with clinical and radiological features suggestive of ILD who were evaluated by ILD multidisciplinary team of Hospital da Luz Lisboa between November 2016 and June 2018. Clinical processes were analyzed.
Results: We included 74 patients, 43 female (58.1%). The mean age was 63.3 ± 14.2 years (range: 28-88). Thirty-seven (50.0%) patients had smoking habits: 25 former smokers and 12 current smokers; the pack-years was 35.4 ± 23.4. Twenty-four patients (32.4%) have bird exposure and 10 (13.5%) another environmental exposure. Regarding drugs associated to ILD, 21 (28.4%) took statin and 14 (18.9%) others drugs. The diagnosis/diagnostic approach was the mainly purpose of the multidisciplinary meeting discussion (58 – 78.4%). The most frequent diagnosis was pulmonary manifestation of connective tissue disease (CTD) (12 – 16.2%). Hypersensitivity pneumonitis (8 – 10,8%), sarcoidosis (7 - 9,5%) and interstitial pneumonia with autoimmune features (7 – 9,5%) were also frequent diagnostics. IPF was admitted in 2 patients but there were 3 (4.1%) patients with usual interstitial pneumonia pattern in evaluation. Ten cases were still in research and the remains 25 patients had others ILD. The most frequent CTD was systemic sclerosis (7 of the 12 patients with pulmonary manifestation of CTD). Thirty-four patients performed corticotherapy, 18 other immunossupresor therapy, 2 were referenced to lung transplantation and 3 proposed to antifibroticc therapy. The diagnosis was supported by pulmonary biopsy in 2 patients (1 cryobiopsy and 1 surgical biopsy), bronchial or transbronchial lung biopsy in 2 and mediastinoscopy in 1 patient.
Conclusions: In our casuistic, we documented greater proportion of ILD of known etiology, such as, pulmonary manifestation of CTD and hypersensitivity pneumonitis, instead of ILD of unknown etiology, namely, IPF. Stringent criteria and a broad ILD multidisciplinary team that also involves rheumatologist and autoimmune disease expert physicians can explain these data. Considering the small size of our sample and the data found, further national studies are needed to better characterize ILD epidemiology in Portugal.

***Key words**: Multidisciplinary team. Intersticial lung disease.*

CO 074. INTERSTITIAL PNEUMONIA WITH AUTOIMMUNE FEATURES – AN OVERVIEW

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Introduction: Many patients with an idiopathic interstitial pneumonia have clinical features that suggest an underlying autoimmune process but do not meet established criteria for a connective tissue disease (CTD). Recently, the term "interstitial pneumonia with autoimmune features" (IPAF) has been published by an ERS/ATS task force to classify these patients (Fisher *et al*. ERJ 2015).
Objectives: Characterization of interstitial lung disease (ILD) patients with diagnostic criteria of IPAF.
Methods: Retrospective analysis of IPAF patients, followed in an ILD outpatient department. Demographic, clinical, serological, functional, and radiological data were obtained.
Results: The IPAF diagnosis represented 3% of patients in our ILD consult, 6 in 184 patients (5 female and 1 male), with a median age of 66 years (56-85 years). The majority were non-smokers (5/6). The patients presented a mean FEV1 of 107.0 ± 29.2%, FVC of 100.0 ± 25.8% and DLCO of 45.3 ± 12.4%. Two patients used oxygen therapy. Five patients were submitted to BAL and a mixed alveolitis was found in all patients. According to Fisher *et al*. criteria, three patients met all three diagnostic domains, two patients met both serological and morphological domains, and one patient had the clinical and serological criteria. Regarding the clinical domains, three patients presented inflammatory arthritis, two patients presented unexplained digital oedema and one patient had Raynaud's phenomenon. Considering the serologic domain, three patients had

an ANA titre ≥ 1:320, two had an ANA nucleolar pattern and one presented a rheumatoid factor greater than twice the upper limit of normal. In the morphological domain, the most frequent HRCT pattern was NSIP (3/6), followed by OP (1/6) and NSIP with OP overlap (1/6). One patient had UIP pattern. Other autoimmune diseases were present: autoimmune thyroiditis (2/6), inflammatory bowel disease (1/6), idiopathic thrombocytopenic purpura (1/6), psoriasis (1/6) and autoimmune hepatitis (1/6). Some autoimmune associated features were described, such as, oesophageal dysmotility (1/6) and unexplained pericardial effusion (1/6). Concerning treatment, one patient is being treated with corticosteroids and five patients with immunosuppressors plus corticosteroids. During a median follow up duration of 23 months, no mortality and no new clinical or serological criteria for specific CTDs were identified.
Conclusions: The percentage of IPAF diagnosis in our sample was inferior to what is reported in the literature (7%). However, IPAF is a new concept, with defined diagnostic criteria, and can be a useful tool to identify more patients and promote research in this group of interstitial pneumonia.

Key words: *Interstitial pneumonia. Autoimmune feature. connective tissue disease.*

CO 075. EFFICACY AND SAFETY OF AZATHIOPRINE TREATMENT IN CHRONIC HYPERSENSITIVITY PNEUMONITIS

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Introduction: Pharmacological treatment of hypersensitivity pneumonitis is usually indicated in cases of severe, acute or chronic progressive disease. Although corticosteroids are usually considered first-line therapy, side effects are considerable and they have not been shown to change the prognosis of the disease in the long term. Immunosuppression with azathioprine (AZA) has allowed a reduction in corticosteroid dose and consequently its adverse effects, however, studies on its efficacy and safety in the treatment of chronic hypersensitivity pneumonitis (CHP) are scarce.
Objectives: To assess the efficacy and safety of AZA as maintenance therapy in patients with CHP.
Methods: Retrospective study that included patients followed at the Diffuse Lung Diseases Unit of a tertiary hospital with diagnosis of CHP under treatment with AZA. The primary outcome was the longitudinal trajectory of respiratory function in the first 2 years of treatment: forced vital capacity (FVC), total lung capacity (TLC), diffusion capacity for carbon monoxide (DLCO), partial oxygen blood pressure (pO_2) and distance walked in the 6-minute walk test (6MWT). All results were expressed as mean ± standard deviation. Functional stability was defined as absence of decline greater than 10% of FVC and greater than 15% of DLCO at the end of 2 years of follow-up. Demographic variables, concomitant therapy and safety profile of AZA were also analyzed.
Results: 62 patients with CHP started treatment with AZA. In 27 cases, treatment interruption occurred before 2 years and in 3 cases there were relevant clinical missing data, and therefore 32 patients were included for longitudinal functional evaluation. The most frequent causes of AZA discontinuation were worsening of the disease and liver toxicity (14.5 and 11.3% of patients, respectively). Patients who completed 2 years of AZA were predominantly female (62.5%), non-smokers (84.4%), had CHP secondary to avian exposure (71.9%) and mean age of 59.6 ± 9.9 years. 81.3% were concurrently receiving corticosteroids. The functional evaluation at the beginning of treatment was as follows: FVC: 73.3 ± 17.9%; TLC: 74.5 ± 17.9%; DLCO: 46.5 ± 17.0%; pO2: 67.5 ± 13.8 mmHg; 6MWT: 388.4 ± 108.5m. After 2 years of treatment, the mean change in values was as follows: FVC: +2.9 ± 25.7%; TLC: +7.9 ± 22.2%; DLCO: -3.6 ± 20.6%; pO2: +2.97 ± 14.1mmHg; 6MWT: -5.0 ± 70.8m. At the end of the 2-year follow-up, 59.3% of the patients were functionally stable, while the remainder had progression of the disease with functional repercussion.
Conclusions: Hepatic toxicity was the most common side effect of AZA in this cohort of patients. More than half of patients who completed 2 years of treatment maintained their respiratory function stabilized. It will be important in the future to understand which of the phenotypes of patients benefit from AZA and which ones will be most advantageous for other therapies.

Key words: *Azathioprine. Chronic. Hypersensitivity. Pneumonitis.*

CO 076. PREVALENCE OF LUNG CANCER AND SURVIVAL IN A COHORT OF PATIENTS WITH IDIOPATHIC PULMONARY FIBROSIS

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Introduction: Lung cancer (LC) is an important comorbidity in idiopathic pulmonary fibrosis (IPF). The incidence of LC is higher in IPF than in other idiopathic interstitial pneumonias. Both diseases result from damage of bronchoalveolar epithelium caused by continuous exposure to exogenous agents, combined with individual genetic susceptibility. The early diagnosis of LC in IPF is paramount because enables a curative treatment. However, IPF patients frequently have poor lung function that may increase the risk of complications and compromise the therapeutic strategy.
Objectives: Identify and characterize patients with IPF that developed LC.
Methods: Retrospective analysis of patients that were followed-up by IPF in department of Pulmonology of Hospital São João between January 1998 and December 2017. The patients diagnosed with LC were identified and characterized. Survival analysis was performed using Kaplan- Meyer.
Results: From 169 patients with IPF, 16 (9.5%) developed LC. Median age of IPF/LC patients was 73 years (IQR, 68-78.8) and 81.3% (n = 13) were males. Most patients (n = 11, 68.8%) had previous smoke history. The diagnosis of IPF and LC was concomitant in 43.8% (n = 7) patients. In the remainders, median time between IPF and LC diagnosis was 11 months (IQR, 5.5-36). The histological types of LC were: 8 (50%) adenocarcinomas, 6 (37.5%) small-cell carcinomas, 1 (6.3%) squamous cell carcinoma and 1 (6.3%) mesothelioma. The most common location was in superior lobes (n = 10, 62.5%), in peripheral areas (n = 13, 81.3%) and in fibrotic areas (n = 13, 81.3%). Eight (50%) had metastatic LC at diagnosis, 5 (31.3%) had local disease and 2 (12.5%) had a locally advanced disease. Patients with metastatic and locally advanced disease were treated with chemotherapy alone and chemotherapy combined with radiotherapy, respectively, as first lines. Five (31.3%) patients with local disease underwent radical treatment, either with surgery (n = 4, 25%), or thermal ablation (n = 1, 6.3%). Major complications of treatment were IPF exacerbation after surgery and lung toxicity due to chemotherapy. The overall survival (OS) since the diagnosis of LC was a median of 9 months (95%CI 0-28.5). OS was better in patients with IPF diagnosed with local LC, comparing to locally advanced and metastatic disease (median OS 41 months vs 4 months, respectively, p = 0.002).

Conclusions: LC is a common complication in IPF patients, and associates with poor prognosis. The most common histological type and location of LC is in line with previous published data. A screening programme based on annual CT might be useful in identify the IPF patient with LC at earlier stages.

Key words: *Idiopathic pulmonary fibrosis. Lung cancer.*

CO 077. LATE-ONSET SARCOIDOSIS – CHARACTERISTICS, CLINICAL COURSE AND TREATMENT

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Introduction: Sarcoidosis is multisystemic non caseating granulomatous disorder of unknown etiology that more frequently affects people aged 25 to 40. Late-onset sarcoidosis is less prevalent and data regarding its clinical presentation and prognosis is insufficient.
Objectives: Characterise the clinical presentation and clinical course of patients with late-onset sarcoidosis.
Methods: Retrospective study of clinical records of the patients followed in the Diffuse Lung Disease outpatient clinic of tertiary hospital between January 2000 and December 2017, with the diagnosis of sarcoidosis after the age of 60 years old. Data regarding demographics, clinical presentation, lung function testing (LFT), imagistical studies, bronchoaveolar lavage (BAL) cellular analysis, biopsies, treatment and clinical evolution.
Results: From 482 patients with sarcoidosis, we identified 23 (4.8%) which were diagnosed older than 60 years old. They were predominantly females (78.3%) with a mean age of 66.1 ± 6.7 years. Non-productive cough, asthenia and effort dyspnea were the most frequent symptoms, while 4 (17.4%) were asymptomatic and none presented with erythema nodosum. Extra-thoracic involvement was identified in 56.5%, mainly extra-thoracic adenopathy (9) and uveitis (4). Biopsy sustaining the diagnosis was obtained in 19 patients (82.6%). BAL was performed in 13 patients (56.5%) and was lymphocytic in 92.3%, of which 66.6% had a CD4/CD8 higher than 3.5. LFT were abnormal in 48.5% of patients, mostly with mild obstruction. Radiological evaluation showed predominance of stage 1 (52.2%) e 2 (43.5%) thoracic involvement. Systemic treatment was needed in 56.5% of patients and topical treatment in 21.7%. Disease resolution was observed in 25% of patients with a follow-up longer than two years.
Conclusions: Our results seem to highlight some differences in presentation and clinical course in this subgroup of patients with late-onset sarcoidosis. Remission rate was low and the need for systemic treatment high, which lead us to question if our current knowledge of sarcoidosis is representative and applicable when the disease manifests itself later in life. Perhaps, more investigation is needed to better characterise late-onset sarcoidosis.

Key words: *Sarcoidosis. Diffuse lung disease.*

CO 078. IMMUNOTHERAPY AS FIRST LINE IN METASTATIC NON-SMALL CELL LUNG CARCINOMA – INITIAL EXPERIENCE OF ONCOLOGIC PULMONOLOGY DEPARTMENT OF CENTRO HOSPITALAR SÃO JOÃO

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Introduction: Immunotherapy (IT) showed efficacy and safety in clinical trials among patients with metastatic non-small cell carcinoma (NSCLC). Pembrolizumab is a monoclonal antibody against PD-1 approved as first line in metastatic NSCLC with PD-L1 expression ≥ 50%. Efficacy and safety data from real life are still lacking.
Objectives: Characterize patients with metastatic NSCLC that received IT as first line and analyse its efficacy and safety.
Methods: Retrospectively, patients diagnosed with metastatic NSCLC that received IT as first treatment in Oncologic Pulmonology department of Centro Hospitalar São João were identified and characterized. Response rate, progression-free survival (PFS) and overall survival (OS) were determined. Survival analysis was performed using the estimator Kaplan-Meyer. Adverse effects attributed to IT were also analysed.
Results: Eleven patients were included. 54.5% (n = 6) were male and median age was 60.0 years (P25 = 53.0; P75 = 72.0). 72.7% (n = 8) had smoking history and median pack-year was 20.0 (P25 = 7.5; P75 = 47.5). 36.4% (n = 4) had ECOG 0, 54.5% (n = 6) ECOG 1 and 9.1% (n = 1) ECOG 2. Comorbidities were present in 63.6% (n = 7) of the patients. Concerning histological type, 54.5% (n = 6) were adenocarcinoma and 45.5% (n = 5) were squamous cell carcinoma. The median PD-L1 expression was 70% (P25 = 50; P75 = 80). 9.1% (n = 1) had KRAS mutation, the remainders had no identified mutation. Partial response was achieved in 45.5% (n = 5) of the patients and 9.1% (n = 1) had disease stabilization. In 36.4% (n = 4) showed no favourable response. Median PFS was 11.0 months (95% Confidence Interval 2.7-19.3). Median OS was not achieved yet. 27.3% (n = 3) of the patients had adverse effects (AE) attributed to IT, that included maculo-papular rash (18.2%; n = 2) and hypothyroidism (9.1%; n = 1). All registered AE were mild to moderate (grade 1 or 2 of *National Cancer Institute´s Common Terminology Criteria for Adverse Events - CTCAE – version 4.0*. Of these patients, two received systemic corticosteroids.
Conclusions: Despite the initial experience in using IT, this novel therapy has been showing encouraging results with a reasonable safety profile. The excellent results are according to clinical trials, yet not all patients responded to IT even when PD-L1 expression is high (≥ 50%). This fact highlights the needed for additional response biomarkers in IT.

Key words: *Immunotherapy. Metastatic non-small cell lung carcinoma.*

CO 079. MASKED BY CHRONIC DISEASE

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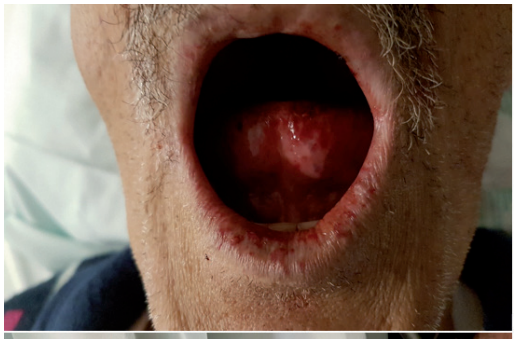
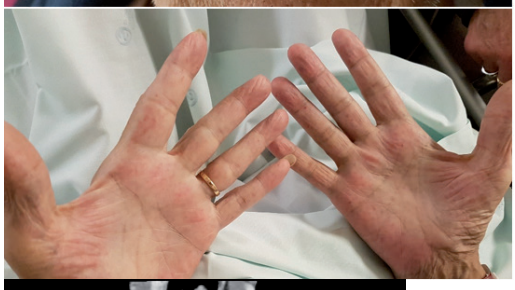
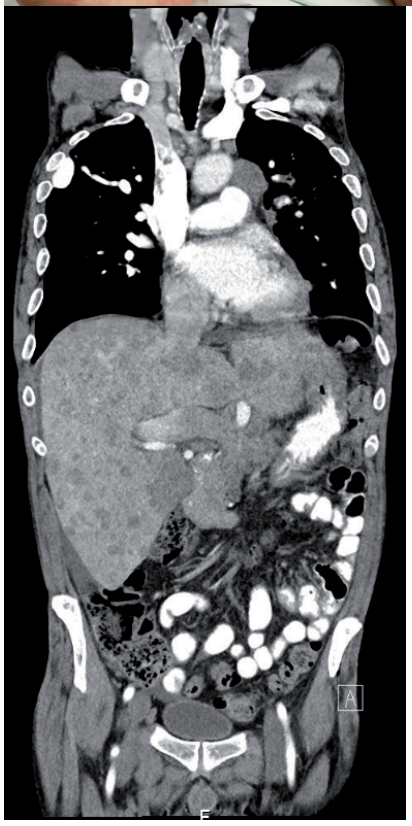
Introduction: The Rendu-Osler-Weber syndrome is a rare chronic systemic fibrovascular dysplasia with autosomal dominant transmission and it has been proposed as a protective factor to some neoplasms.
Case report: We present a case of a 64-year-old man, retired of ship welding, recent former smoker (94 UMA), with Rendu-Osler-Weber syndrome with blood loss and anaemia under frequent transfusion support, pulmonary arteriovenous malformations, chronic obstructive pulmonary disease GOLD B and heart failure. One week prior to hospitalization, he presented with a community acquired pneumonia and was treated with empirical antibiotherapy. Later the patient returned with fatigue, orthopnea, peripheral edema, anorexia and persistency of mucopurulent and hemoptoic cough. On physical examination, he presented with polypnea and O2 saturations > 96% at room air, reduced vesicular murmur in both lung bases, symmetric peripheral edema and disperse cutaneous and mucosal telangiectasias. Laboratory tests showed regular anaemia and without elevation of inflammatory markers. Decompensated heart failure was assumed and the patient was admitted. Due to the finding of hepatomegaly and an irregular left para-hilar radiopacity, a thoraco-abdominal-pelvic computed tomography was requested. It showed an irregular

mass involving the left pulmonary hilum; an arteriovenous malformation in the right superior lobe; multiple mediastinal and retroperitoneal lymphadenopathy; multiple hepatic nodular formations and small lytic lesions in the iliac bones suggestive of metastasis. A bronchofibroscopy was performed which detected indirect signs of cancer in the left main bronchus where biopsies were obtained with compatible histology with small cell carcinoma (CD56+, CKAe1/Ae3+, TTF-1 -, sinaptofisin -; ki67 > 95%). Therefore, it was small cell lung cancer, stage IV, with hepatic and bone metastatic spreading. It was decided to provide supportive and palliative care. The patient died one month after discharge with disease progression.







Discussion: We conclude that in patients with chronic disease associated with a progressive worsening of clinical state it is necessary a higher degree of suspicion for neoplasia. Particularly in Rendu-Osler-Weber syndrome considering the recurrent hematic losses and differential diagnosis of a mass with arteriovenous malformation. We stand out the investigational interest of this syndrome as a protective factor for neoplasms, as well as its progression. However, in this case we verified a rapid evolution with a negative outcome.

Key words: *Rendu-Osler-Weber syndrome. Lung cancer. Stage IV.*

CO 080. FACTORS PREDICTING MORTALITY IN HOSPITALISED PATIENTS WITH LUNG CANCER

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Introduction: Lung cancer is currently the leading cause of cancer-related mortality worldwide. It is a frequent cause of hospital admissions due to its high morbidity and mortality. The incidence of lung cancer is still increasing, leading to an increasing number of hospital admissions and, consequently, deaths.
Objectives: To analyse the factors associated with higher mortality in patients with lung cancer hospitalised in a Pulmonology Department.
Methods: Retrospective, observational study, in which data were collected from clinical records of hospitalised patients with lung cancer in our Pulmonology Department over a one-year period.
Results: During the period, 74 admissions of patients with a previous diagnosis of lung cancer were registered in our department. The majority were male (82%), with a mean age of 66 years old. On average, these patients were hospitalised for 20 days (mean hospitalisation period for our department: 12 days), and 38% died (overall percentage of deaths of patients admitted to our department: 13%). Hospital complications occurred in 54% of admissions. In our evaluation of mortality factors in these patients, higher mortality rates correlate with disease stage [patients with stage IV lung cancer have higher mortality rates than those in earlier stages (45% vs 8%, respectively – $p < 0.05$)] and the occurrence of hospital complications [the mortality rate was higher when complications occurred (55% vs 22% in those without complications – $p < 0.05$)]. Although not statistically significant, mortality rates were also higher in patients hospitalised longer than 20 days (43% vs 34% in those hospitalised for a shorter period) and in those who had not wet started cancer treatments or were in palliative care (mortality rate of 50% in these cases vs 35% in those undergoing cancer treatments at the time of admission, and 18% in those under surveillance). There were no statistically significant differences in mortality in relation to age, gender or hospitalisation cause (related vs not related to the disease or its treatment).
Conclusions: Lung cancer patients are complex, leading to longer stays and mortality rates compared to other patients hospitalised in our department. Patients hospitalised for longer periods, patients suffering from hospital complications and patients not wet undergoing cancer treatment or those receiving palliative care had worse prognoses, with higher mortality rates. Making efforts to reduce hospital admissions and helping these patients maintain a good quality of life, creating better domestic support networks and providing palliative care, should be our priority.

Key words: *Lung cancer. Mortality. Hospitalisation.*

CO 081. RADIATION PNEUMONITIS IN LUNG CANCER

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Introduction: Radiation therapy is an important form of treatment in patients with lung cancer. However, due to the radiosensitivity of

the lung, toxic effects, like radiation pneumonitis (RP), are relatively frequent. RP is the main dose limiting factor in this type of treatment. Several factors have been studied as predictors of toxicity but the incorporation of patient-related factors needs further research in order to be able to identify the highest risk patients.
Objectives: To study risk and protective factors for RP in patients with diagnosis of lung cancer under radiation therapy.
Methods: 50 patients were enrolled, which included those with diagnosis of lung cancer under radiation therapy between January 1st 2015 and December 31st 2017; patients subjected to palliative dosage were excluded. The diagnosis of RP was defined according to the CTCAE (Common Terminology Criteria for Adverse Events) scale, in a 6-month period after treatment. IBM SPSS statistics 23 was used for statistical analysis. Continuous variables with normal distribution were represented by mean and standard deviation; continuous variables for which normality was not verified were represented by median and inter-quartil interval; categorical variables were signified by frequency and percentage. For comparative analysis of categorical variables the qui-square test or Fisher's exact test were used; for continuous variables the t-Student test or the U of Mann-Whitney test were used. p value was defined as $p < 0.05$.
Results: From the 50 patients included in the sample, 20 were considered has having RP. Statistically significant results were found between the diagnosis of RP and patients who received a boost of radiation, which presented as a risk factor for the development of RP (sig = 0.040; OR = 3.457); on the other hand, the inferior localization of the tumor presented as a protective factor (sig 0.039; OR = 0.236). The stage of the disease at the time of diagnosis also obtained statistical significance, with a stage IIIb (sig = 0.046; OR 3.600) or T > 3 in the TNM classification system (sig = 0.035; OR = 3.529) presenting also has risk factors. The amount of cigarettes consumed per day seems to have some influence but it does not reach statistical significance (p = 0.060).
Conclusions: More advanced stages of the disease and higher doses of radiation are generally considered has risk factors. These results suggest that the administration of a boost of radiation increases the likelihood of developing RP. On the other hand, the inferior localization of the tumor is pointed out as a risk factor in most studies but in this sample, it appears to be a protective factor. The main limitations of this study are the limited size of the sample and the retrospective design.

Key words: *Radiotherapy. Radiation. Radiation pneumonitis. Lung cancer.*

CO 082. IMAGING IN THE DIAGNOSIS OF MEDIASTINAL MASSES

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The mediastinum is demarcated laterally by the pleural cavities, superiorly by the thoracic inlet, inferiorly by the diaphragm, anteriorly by the sternum, and posteriorly by the spine. There are several methods for dividing this anatomical region. In this work, we will divide the mediastinum into superior and inferior, being the inferior subdivided in anterior, middle and posterior. A mediastinal mass may be an incidental finding on a screening chest radiography, or it may be found during an evaluation for chest symptoms. Imaging studies are essential tools for diagnosis of mediastinal lesions. While chest computed tomography (CT) is the mainstay for initial evaluation of mediastinal masses, CT results are frequently inconclusive. Thoracic magnetic resonance imaging (MRI) offers a non-invasive way to further characterize mediastinal lesions, their site of origin and its relationship with adjacent anatomic structures. Its higher soft-tissue contrast and improved differentiation of cystic from solid masses provides more diagnostic specificity. The use of thoracic MRI in the appropriate clinical setting, has the potential to improve clinical diagnosis, eliminate unnecessary intervention and reduce overall health care costs. We will describe four mediastinal masses with different origins and locations, and we will show them by three imaging methods – chest radiography, computed tomography and magnetic resonance. They were confirmed to be a pericardial cyst and a lymphoma in the anterior mediastinum, a ganglioneuroma in the posterior mediastinum and a schwannoma in the superior mediastinum. The pericardial cyst represent 5 to 10% of all the mediastinal masses. It is a benign lesion, often located in the right cardiophrenic space and visible on the chest X ray. Usually does not cause symptoms, but may occasionally be responsible for retrosternal pain. Lymphoma accounts for 13% of all mediastinal masses. Hodgkin's disease is the lymphoma most often affecting the mediastinum, usually the anterior, although all the other compartments may be involved as well. Most patients with Hodgkin's lymphoma have constitutional symptoms and multiple mediastinal adenopathies. Neurogenic tumors represent the most common cause of posterior mediastinal mass and 21% of all mediastinal masses. In adults, only about 1-2% of neurogenic tumors are malignant. They are usually isolated masses, but if multiple, should raise the diagnostic suspicion of neurofibromatosis. Ganglioneuromas are benign tumors differentiated from the ganglia of the autonomic nervous system, more frequently from the paravertebral sympathetic chains of the posterior mediastinum. Ganglioneuromas are generally asymptomatic and often found incidentally because they are slow growing and endocrinologically inactive. Schwannomas arise from the nerve sheaths of the peripheral nerves, most often from the spinal or intercostal nerves. They are usually benign, although the malignant variant also exists. They may be asymptomatic, or presented by compressive symptoms such as dry cough, dyspnea or thoracalgia. Thoracic magnetic resonance imaging allowed a better characterization of these four mediastinal masses, accelerating the diagnosis and the therapeutic decision.

Key words: *Mediastinum. Mass. Imaging methods. Thoracic magnetic resonance.*

CO 083. AIRWAY COMPLICATIONS AFTER LUNG TRANSPLANT – A 10 YEAR EXPERIENCE

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Introduction: Although lung transplantation leads to improved survival and quality of life in patients with terminal lung disease, the rate of airway complications is not negligible.
Objectives: Analyse the incidence of airway complications after lung transplantation, at our department, in a 10 year period, describe treatment strategy and identify risk factors.
Methods: Recipient, graft, and post-transplant variables were analysed through file consultation. Patients with less of 6 months of follow-up were excluded.
Results: 149 lung transplants were performed between January 2008 and June 2017 in Portugal (60% of male patients), 77 single lung transplants with a total of 221 airway anastomosis at risk. Lung transplant were performed in interstitial lung disease (49.7%, 74 patients), cystic fibrosis/other bronchiectasis (26.2%, 39 patients) and emphysema (24.1%, 36 patients). There was a total of 34 airway complications (15.3%), of that 12 were considered severe (5.4%). There was need for endobronchial treatment in 11: balloon bronchoplasty in 3, removal of exophytic granulation tissue in 3, endobronchial prosthesis in 3 and stent in 1, balloon bronchoplasty and radial cut in another. Exophytic granulation tissue was found in 15 anastomosis, stenosis in 13, bronchomalacea in 2, dehiscence in 1,

there was also 1 stenosis that evolved to bronchomalacea, 1 dehiscence which overtime caused stenosis and 1 severe anastomotic necrosis. The mortality directly related with airway complications was 1.3% (2 patients, one with airway anastomotic dehiscence, and other with severe anastomotic necrosis). Graft isquemic time was a significant predictor of airway complications. The survival of the patients without complications was of 91,2% at 1 year and 5 year 67,4%, those with complications was 94% at 1 year and 5 year survival of 72% (p > 0,005).
Conclusions: Our results are similar to those reported in the literature. Severe complications are less common, although associated with high mortality and morbidity rates.

Key words: *Lung transplant. Airway complications. Bronchial anastomosis.*

CO 084. UNIPORTAL VATS ANATOMICAL RESECTIONS – DOES PREVIOUS TOBACCO EXPOSURE ADVERSELY INFLUENCE POST-OPERATIVE OUTCOMES?

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Introduction: Single-port video-assisted thoracic surgery (VATS) for anatomic pulmonary resection has been performed in our centres for more than 4 years. A high percentage of patients presenting for minimally-invasive lung surgery are either current smokers or have a history of smoking, which is typically associated with many physiological pulmonary changes. Whether or not smoking increases the risk of postoperative pulmonary complications (PPCs) in lung resection patients remains controversial. The main goal of this study was to analyse the effects of smoking on the risk of post-operative complications and morbidity in patients submitted to lung resection surgery.
Methods: Peri-operative data on all cases of anatomical lung resection surgery through single-port VATS performed from the 1st December 2013 to the 31st July 2018 by the same team of cardiothoracic surgeons were collected and retrospectively reviewed. Demographic data, as well as diagnosis, surgical procedure, pre-operative lung function tests, in-hospital length of stay (LOS) and post-operative drainage were registered. Patients were divided in two groups according to their previous history of active smoking: one group included all patients who had a history of tobacco abuse in any period during their lifetime and the other group including patients who had never smoked. Post-operative complications and morbidity were compared between both groups through chi-square and one-way ANOVA tests.
Results: A total of 313 procedures were performed, only 303 of which were included in our study due to lack of post-operative data. Mean age at time of surgery was of 62.85 years (SD = 12.24). A 52.81% percentage of patients (n = 160) had a history of tobacco abuse while 47.19% (n = 143) had never smoked. Non-smokers had significantly better pre-operative FEV1, FVC and DLCO levels than smokers ($p < 0.05$). Smoking history showed to increase the risk of post-operative prolonged air leak ($p = 0.025$) and overall morbidity ($p = 0.05$). Smokers had an approximately 2-day longer in-hospital LOS than their counterparts ($\mu = 5.36$ days in smokers vs $\mu = 7.53$ days in non-smokers, $p < 0.05$), as well as longer operative times and both intra and post-operative drainage levels.
Conclusions: A history of active tobacco exposure during a patient's course of life has a negative impact on morbidity in patients submitted to anatomical lung resection VATS, regardless of their underlying diagnosis, increasing early post-operative complications and prolonging in-hospital stays.

Key words: *VATS. Tobacco. Ressection. Uniportal.*

CO 085. PRIMARY SYNCHRONOUS LUNG TUMORS

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The occurrence of more than one lung neoplasm in the same patient is a rare event. The incidence of primary pulmonary synchronous tumors is estimated to be about 2% in patients undergoing surgery for lung cancer. It is fundamental to know how to recognize this entity since, in the case of resectable tumors, surgery brings a significant increase in the patient's survival. This study reports a series of 6 patients with primary synchronous lung tumors submitted to surgery between 2016 and 2018. The patient's demographics, histological type, surgical treatment, complications and length of hospital stay were analyzed. The mean age was 65 years [53-76] and 50% were females (n = 3). In two patients resection of the nodules was performed at the same operative time and the remainder at different operative times with a median of two months interval. All surgeries were performed by uniportal videothoracoscopy except one. The adenocarcinoma was the main histological type, seen in 9 of the resected nodules. Other histological types were squamous cell carcinoma (n = 1), carcinoid tumor (n = 1) and pneumocytoma (n = 1). The surgical treatment consisted of left superior trisegmentectomy followed by right upper lobectomy, left inferior lobectomy followed by right inferior lobectomy, left superior lobectomy followed by anatomical resection of the right segment 1, right upper lobectomy followed by left superior lobectomy, right upper lobectomy with wedge resection in the right inferior lobe and one right upper sleeve lobectomy. The median time of hospitalization was 6 days [3-21] with postoperative complications seen in 2 patients (prolonged air leakage and atrial fibrillation). The recognition of this identity, coupled with the minimally invasive techniques available today allows to open the range of patients submitted to surgical treatment with a low morbidity.

Key words: *Primary synchronous lung tumors. Minimally invasive surgery.*

CO 086. RESPIRATORY SLEEP DISORDER IN OBESE CHILDREN AND ADOLESCENTS

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Introduction: Obesity is a risk factor for respiratory sleep disorder (RSD), conditioning the regulation of blood gases and/or sleep fragmentation, with increased morbidity associated. Early diagnosis and intervention are important in prevention.
Objectives: To evaluate the presence of RSD in obese children and adolescents.
Methods: Retrospective study (January 2011-June 2018), polysomnography (PSG) of children and adolescents with BMI > P97 were revised, regardless the reason for referral. The variables evaluated were: gender, age, BMI and PSG data; sleep efficiency (SE), snoring, apnea/hypopnea index (AHI), desaturation index (ODI) and mean oxygen saturation (SpO_2 mean). Descriptive and comparative analysis ($\alpha = 5\%$) (SPSS® 21.0).
Results: 200 PSG of 184 children and adolescents (63.5% boys) were included, with a mean age of 10 (A) (1-20). 48% PSG revealed OSAS (mild 53 (26.5%), moderate 16 (8%) and severe 27 (13.5%)). The presence of snoring ($p = 0.001$) and ODI ≥ 3/h ($p \leq 0.001$) was associated with higher mean BMI values. There were no differences in the mean values of BMI for the diagnosis of OSAS, mean SpO_2 or ES.

Conclusions: In the child and adolescent, presence of snoring and desaturation are associated with higher BMI. No association was found between the presence of OSAS and BMI, so obesity should not be a single criterion for the performance of PSG.

Key words: *Respiratory sleep disorder. OSA. Obesity. Paediatrics.*

CO 087. OBSTRUCTIVE SLEEP APNEA SYNDROME, SYMPTOMS AND RISK FACTORS IN A WORKING POPULATION

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Introduction: Few data exist on the prevalence of symptoms and risk factors of obstructive sleep apnea syndrome (OSAS) and Excessive Daytime Sleepiness (EDS) among the working population in Portugal. The clinical importance of OSAS and EDS are due to cardiovascular repercussions and its effects on morbidity and mortality, as well as neuropsychological alterations that lead to the occurrence of occupational accidents, which may affect the alertness of the worker and consequently his attention to professional activities.
Objectives: To determine the prevalence and risk factors of OSAS and EDS in a defined group of workers.
Methods: Cross-sectional observational study carried out on workers of a company that develops logistics solutions in the health area of the Oporto region, through the answer of the Berlin questionnaire and the Epworth sleepiness scale. The measurement of the neck circumference was also collected.
Results: A total of 160 workers with a mean age of 37.18 ± 9.17 years were evaluated. Women accounted for 42.5% (n = 68) of the sample and men 57.5% (n = 92). There was a considerable prevalence of workers with symptoms [42.5% (n = 68) snoring and 24.4% (n = 39) presented daytime fatigue] and with risk factors for OSAS [neck circumference > 40 cm were found in the same percentage - 9.4% (n = 15) - comparatively to the workers with arterial hypertension]. In the study population, the prevalence of workers with medium and high risk of OSAS was 18.8% (n = 30), of which 8.12% (n = 13) were Logistics Operators and 7.5% (n = 12) were Drivers. Of the total sample, 15.62% (n = 25) presented excessive daytime sleepiness, requiring future medical research.
Conclusions: Applying the Berlin questionnaire and the Epworth sleepiness scale in occupational health examination to those workers who present risk factors for OSAS and EDS, may be advantageous in terms of the early diagnosis of such pathologies. It should be noted that none of the workers with a high risk of OSAS had a previous medical diagnosis, which highlights the diagnostic challenge of this pathology. Further studies on the prevalence of symptoms and risk factors of OSAS and EDS are required through the answer of the referred questionnaires in the Portuguese working population.

Key words: *Obstructive sleep apnea syndrome. Berlin questionnaire. Epworth sleepiness scale. Excessive daytime sleepiness. Occupational health.*

CO 088. OBSTRUCTIVE SLEEP APNEIA IN NON-OBESE PATIENTS

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Introduction: Obstructive sleep apnea syndrome (OSAS) is a respiratory sleep disorder with a growing prevalence in recent years. Obesity is a major risk factor for OSAS. However, there are few studies to characterize non-obese OSA patients and their response to therapy.
Objectives: To determine the proportion and physiological characteristics of non-obese patients with and their adherence to continuous positive pressure ventilation (CPAP).
Methods: Of the 197 consecutive polysomnographic studies performed in the sleep laboratory during 2016, 78 adult patients with OSAS (apnea-hypopnea index > 5 events/hour) and at least one year of follow-up -up. Anthropometric data, daytime sleepiness (assessed by the Epworth Scale), comorbidities and adherence to CPAP were compared between obese (BMI ≥ 30 kg/m^2) and non-obese patients. Adhesion was defined as daily use > 4h in at least 70% of nights. Children, patients with suspected neurological sleep disturbances or with global respiratory insufficiency adapted to bilevel ventilation were excluded.
Results: Of the 78 patients diagnosed with OSAS, thirteen (16.7%) had a normal BMI (< 25 kg/m^2) and 40 (51.3%) had a BMI < 30 kg/m^2. The mean age in the group of patients without obesity is 62 years vs 61 years in the obese. In the non-obese OSAS group, the majority were male (n = 25, 62.5%), while female predominated in obese patients (n = 21, 55%), p = 0.11. Hypertension is the most frequent cardiovascular comorbidity in both groups, 65% (n = 26) in the obese and 57.5% (n = 23) of the non-obese patients; followed by diabetes mellitus in the obese (n = 14, 36.8%) and atrial fibrillation in the non-obese (n = 5, 12.5%). Ten non-obese patients (25%) used psychoactive drugs, slightly higher than obese patients (n = 8, 21%), p = 0.70. The anatomic alterations of the upper airways are also more prevalent in the non-obese group (n = 10, 25%), compared to 11% of the obese (n = 4), but without statistical significance (p = 0.09). In this sample, the initial excessive daytime sleepiness is overlapping in both groups, referred in 14 (35%) patients without obesity vs 11 with obesity (29%). OSAS is more severe in obese patients with an average AHI of 38/h vs 25.1/h in non-obese (p = 0.001). In patients in whom CPAP was prescribed, adherence to ventilation at 3 months of treatment was low in both groups but slightly lower in non-obese (42%) vs 45%, however with no statistical significance (p = 0.82). At the end of one year, there was an increase in CPAP adherence to 56% in both groups.
Conclusions: A significant proportion of patients with OSAS are not obese, being greater than 50% in this sample. The clinical suspicion of OSAS and the use of diagnostic tools aimed at this population constitute a growing challenge. Although some studies have documented lower adherence to CPAP in non-obese patients, in this analysis the use of night-time ventilation was overestimated in both groups.

Key words: *OSA. Non-obese. CPAP. Compliance.*

CO 089. THE IMPACT OF THE STOP-BANG QUESTIONNAIRE IN THE REFERRAL OF PATIENTS WITH SUSPECTED OBSTRUCTIVE SLEEP APNEA (OSA)

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Introduction: Obstructive sleep apnea (OSA) is a disease with an increasing prevalence and is associated with metabolic syndrome, high cardiovascular morbidity and mortality and a higher risk of traffic accidents. In general, the need of polysomnography (PSG) is higher than the established capacity, and it is therefore relevant to divulge different screening tools and severity triage methods, such as the STOP-Bang questionnaire, to Primary Care providers.
Objectives: To assess and improve the quality of the referrals from patients with suspected OSA and evaluate the correlation between the STOP-Bang questionnaire and the result of the PSG.

Methods: Cross-sectional, descriptive and analytical study. A convenience sample of patients with suspected OSA, referred from Primary Care to a specialized sleep disorder appointment in a Pneumology Department of a Portuguese hospital in 2016 was analyzed. Information given in the referral by Primary Care providers through ALERT P1® and data from the first Pneumology appointment registered in SClínico® were assessed. The STOP-Bang questionnaire, which has been validated in Portuguese, was applied. The correlation between STOP-Bang score and the result of the PSG was studied. Statistical analysis was performed using R® software.
Results: In this study 131 patients were included. The average age was 54.6 ± 12.2 years and 73.3% were male. The STOP-Bang referral score ranged from 0 to 6, with a mean of 3.67 ± 1.25, with 18.3% of the patients being at a low risk of OSA, 57.3% at a moderate one and 24.4% at a high risk of OSA. The STOP-Bang score of the Pneumology appointment varied from 1 to 8, with a mean of 4.89 ± 1.53, with 6.9% of the patients being at low risk, 31.3% with a moderate one and 61.8% at a high risk of OSA. The OSA diagnosis was confirmed through the PSG in 76.3% of the patients referred by Primary Care. Despite the higher scoring of the STOP-Bang questionnaire when estimated through the data of the Pneumology appointment, there is a correlation between these values and the information provided in the referral (Kendall's Tau-b of 0.506; p = 0.000). There was a statistical significant correlation between the results of the PSG and the STOP-Bang score of the referral (Tau-b of 0.201; p = 0.002) and the Pneumology appointment (Tau-b of 0.376; p = 0.000).
Conclusions: The STOP-Bang questionnaire is an essential screening and risk stratification tool in patients with suspected OSA. Its application is relevant to standardize the referrals of the Primary Care providers, helping to prioritize the scheduling of Pneumology appointments and polysomnographys, in order to adjust the response time of Secondary Health Care to the patient's level of risk and comorbidities.

Key words: *Obstructive sleep apnea. Screening. Referral. STOP-Bang questionnaire. Polysomnography.*

CO 090. FIRST YEAR FOLLOW UP PROTOCOL OUTCOMES FOR SLEEP DISORDER BREATHING PATIENTS TREATED WITH POSITIVE AIRWAY PRESSURE (PAP)"

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Introduction: Despite the benefits of using PAP treatment for Obstructive Sleep Apnea Syndrome (OSAS), adherence remains a challenge and a major determinant to achieve successful outcomes.
Objectives: First year outcomes evaluation of a follow up Protocol for sleep disorders patients treated with positive airway pressure.
Methods: Retrospective study of patients diagnosed with OSAS, included in a protocol after PAP prescription and home adaptation, followed up, between July 1 2017 and June 30 2018. Protocol is based on a personalized approach to the new treatment adaptation process. After diagnosis and PAP prescription, the patient has an early evaluation (always during the treatment's 1st month) at technical consultation (by a Cardiopneumology technician). Parallel to the medical consultation, the patient has technical reassessments whose frequency is dictated, not by the protocol, but by patient's progress in adapting to PAP. Medical and technical team availability and close collaboration are always the premise. Interventions and evaluations carried out in the technical consultation: disease education, effects/benefits of PAP, material and accessories: adjustment, adaptation or replacement according to complaints and/or registrations, parameters (adjustment based on equipment algorithm and/or nocturnal oximetric changes), monitoring: symptoms evolution and effects with PAP treatment.
Results: 129 patients, 67.4% men, age 61.4 ± 12.03 years; BMI 32.9 ± 6.15 kg/m^2, Epworth Scale 6.9 ± 5.27; AHI 33.6 ± 23.46/hour. Adherence was 6.32 ± 1.85 hours/night, 92.3% use, 83.7% use > 4 hours; mean follow-up was 180.4 ± 98.20 days; Leaks was 1.7% ± 4.4 (Philips-Respironics devices) and 10.2 L/min ± 7.14 (Resmed devices) the Residual AHI was 3.3 ± 3.97/hour. At the end of protocol´s first year, 68.2% (88) of the patients were on Auto-CPAP mode (7.7 ± 2.42/16.3 ± 2.21 cmH_2O) and, 27.1% (35) on CPAP mode (10.4 cmH_2O ± 1.79) and 4.7% (6) on Auto-Bilevel mode (12.5 ± 3.51 cmH_2O/22.17 ± 3.66 cmH_2O). Facial mask was adapted in 71.3% (92), nasal mask in 28.7% (37) and 43.4% (56) had humidifier.
Conclusions: Despite the small patient's sample and short follow up period, we noticed the PAP treatment adherence superior values compared to the usually described in literature. This, we believe, can be explained by the close and flexible team work (medical and technical) committed in customizing and adapting protocol to each patient´s needs. Early support in solving patient´s difficulties in adapting to PAP treatment is, we also believe, crucial to achieve good adherence outcomes.

Key words: *Adherence. Protocol. Positive airway pressure treatment. Technician consultation. Team Work.*

CO 091. NECK POSITION THERAPY EFFICIENCY IN POSITIONAL OBSTRUCTIVE SLEEP APNEA TREATMENT

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Introduction: A large percentage of patients with obstructive sleep, just as snoring are affected by body position. There are several definitions for positional obstructive sleep apnea (POSA), and the most used definition is the Cartwright.1-2 POSA treatment could be based on the supine position avoidance method.
Objectives: Verify the effectiveness of Neck positional therapy device (NPTD) POSA by avoiding supine position.
Methods: Longitudinal cohort study, prospective. 15 patients with POSA (apnea/hypopnea index (AHI) ≥ 5/hour) at polisomnography (PSG) result with AHI Supine/AHI no Supine) ≥ 2, Body Mass Index (BMI) ≤ 35 Kg/m^2 without pacemaker. For the treatment of POSA, a NPTD (NightShift™ Sleep Positioner) was used during 2 months. Treatment monitoring was performed by sending the detailed usage reports. After 2 months, a level III PSG (NOX medical® NOX T3) was performed simultaneously with the use of NPTD to assess therapeutic efficacy. We considered for analysis: anthropometric data, Epworth sleepiness scale (EPW), baseline and final PSG results with NPTD. The results are presented using descriptive statistics, and for comparative tests is used the nonparametric Wilcoxon test with a significance level of 95%, obtained through SPSS V 20.0.
Results: 14 patients conclude the experimental period, 5 males 9 males, with an average age of 52.5 ± 11.2 years, height 168.4 ± 12.5 cm, baseline weight of 80.0 ± 14.7 kg, baseline body mass index (BMI) 28 ± 3 kg/m^2, and baseline EPW of 8.3 ± 5, with no significant variations baseline-final data for weight and BMI (Z = -0.98, p = 0.32 and Z = -0.9, p = 0.37, respectively). By OSA severity stratification according to AASM: 11 mild, 2 moderate and 1 severe, total average: AHI 13.4 ± 7.9/h, ODI 11.9 ± 7.8/h, average SpO_2 93.2 ± 1.6 (%), SpO_2 min 84.4 ± 4.4, T90 6.3 ± 13.7 (%), percentage of snoring 44.4 ± 22, 1 (%). There was a statistically significant decrease between baseline and final AHI (Z = 3.3, p = 0.001), ODI (Z = 3.3, p = 0.001), average SpO2 (Z = -3.2; p = 0.001); Minimum SpO2 (Z = -2.7, p = 0.007) and EPW (Z = -2.0, p = 0.045).
Conclusions: These preliminary results suggest that positional therapy, especially with a NPTD, may be a first line treatment in the POSA treatment, but it is important to obtain long term results regarding the adherence of this therapy.

Key words: *Obstructive sleep apnea. Positional therapy.*