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COPD and physical activity

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and the blind pleural biopsy revealed nonspecific pleuritis. Due to symptomatic persistence and pleural thickening causing pulmonary restriction, she underwent pulmonary decortication and parietal pleurectomy. Pleural histological examination revealed epithelioid cells proliferation with atypia and positive for the CD34 marker, favoring the diagnosis of epithelioid hemangioendothelioma (Fig. 1D). The thoraco–abdominal–pelvic CT did not show other alterations. Chemotherapy was initiated with Doxorubicin but the patient died after the first cycle, 6 months after admission.

Primary thoracic sarcomas are tumors derived from mesenchymal cells, they represent 5% of all thoracic neoplasms and may involve lung, pleura and mediastinum.² The leiomyosarcoma and epithelioid hemangioendothelioma with pleuropulmonary origin are two extremely rare types of these tumors that, due to the clinical and histological similarity to other pleural neoplasms, are often difficult to diagnose, with most of the cases diagnosed by surgical biopsy.^{3,4} The pleuropulmonary leiomyosarcoma usually presents as a nonspecific pleural mass and/or effusion with pulmonary involvement as a well defined nodule with smooth margins, necrotic mass or endobronchial lesions.^{2,3} Some risk factors have been identified, namely previous chemotherapy or radiation therapy and environmental or occupational exposure.² It is characterized by malignant spindle cells with immunohistochemical staining for smooth muscle actin, vimentin and desmin.^{2,3} The treatment of choice in the limited disease is surgical resection associated with chemotherapy and/or radiation assessed on a case-by-case basis, depending on the histological grade and the clinical stage.^{2,3} In the advanced disease only chemotherapy is recommended.³ The median survival for patients with extensive disease is about 12 months.³ The pleural epithelioid hemangioendothelioma has vascular origin and usually is manifested by unilateral pleural effusion and nodular pleural thickening.^{4,5} The clinical presentation is variable, however, chest pain, dyspnea and cough are consistent symptoms.⁴ Although risk factors are unclear, cases have been described that follow exposure to occupational contaminants, such as roofing material, industrial exposures, cheese making, and asbestos.⁶ It is characterized by cords and nests of epithelioid cells similar to endothelial cells, associated with a myxohyaline matrix and immunoreactive for CD34, CD31, vimentin and factor VIII.^{2,4} Surgical resection is recommended but, when impracticable, chemotherapy has been used, although not

uniformly.⁴ Compared to the pulmonary form, the pleural epithelioid hemangioendothelioma usually has an aggressive clinical course and a poor prognosis.^{5,7} The authors describe two patients with rare causes of pleural effusion, illustrative of the diagnostic difficulty and aggressiveness of these tumors.

Conflicts of interest

The authors have no conflicts of interest to declare.

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COPD and physical activity



In the general population, the benefits of physical activity (PA) are well documented, and include primary prevention and control of many chronic diseases, such as metabolic or cardiovascular disease. Being physically active preserves bone mass and muscle strength, promotes well-being, cognitive function and quality of life. The American College of Sports Medicine states that healthy adults aged 18–65 years¹ need a minimum of 30 min of moderate aerobic exercise per day, five days a week, and the British Association

of Sport and Exercise Sciences advises at least 150 min of moderate-intensity aerobic activity each week, or 75 min of vigorous-intensity aerobic activity per week.² Adults not meeting these values should be considered as insufficiently active. However, according to GOLD guidelines,³ PA is recommended for all patients with COPD just because it seems intuitively correct, given the overall population benefits, but without COPD-specific evidence to support any recommendations. On the other hand, pulmonary rehabilitation (PR) has been carefully evaluated: it improves exercise capacity, recovery after hospitalization and reduces the

exacerbations requiring hospitalizations. The 2015 American College of Chest Physicians and Canadian Thoracic Society Guideline,⁴ the ALAT – 2014 COPD Clinical Practice Guidelines,⁵ and many other papers, do not include any recommendations regarding physical activity in COPD. However, for primary prevention, treatment and control of many other diseases, such as cardiovascular diseases or hypertension, recommendations have been developed, taking into account the physical exercise requirements in relation to duration, frequency and intensity. For COPD patients there is an emerging need not only for recommendations, but for practical interventions that would increase physical activity which, combined with smoking cessation and pharmacological treatment, could prevent disease progression, comorbidities and exacerbations.

Physical inactivity is a central problem in COPD patients and plays a crucial role in the development of COPD comorbidities. Being physically active is associated with a reduced risk of hospital admission and mortality,⁶ and this is the best available evidence, although moderate, concerning PA and COPD. More low-intensity physical activity reduces the risk of hospitalization, but daily high-intensity PA does not generate additional benefits.⁷ Because of the increased exertional dyspnea due to pulmonary function and gas exchange abnormalities, the patients decrease their physical activity, and deconditioning and muscle weakness are physiological consequences. Patients with severe and very severe COPD carry out their daily activities in fewer and shorter bouts than those in mild and moderate stages.⁸ However, PA is a multidimensional issue and it is the result of a complex interaction of many factors, such as socioeconomic status, more or less sedentary occupation or patients living alone or with family members.⁹

A sedentary lifestyle is present in all stages of severity of COPD. Decreased PA is already present in the early stages of the disease development, and worsens as the disease severity progresses. Many patients with COPD (30%) did not achieve 30 min of walking time per day, and are effectively housebound. They not only walk for less time per day, but they also walk 25% slower than healthy people, and they spend 12% of the day-time lying down, compared to 4% for healthy elderly people.¹⁰ But COPD patients are capable of bouts of moderate-to-vigorous physical activity. The decline in PA level is associated with increasing airflow limitation, but it is not significantly associated with changes in exercise capacity: avoiding activities is a strategy for avoiding symptoms. These two observations make the improvement of PA feasible in clinical practice.

Patients with COPD are less physically active than healthy subjects, but it is unclear which are the determinants and outcomes of this reduced activity.¹¹ Comorbidities contribute to impaired functional exercise capacity,¹² but we were not able to establish age, socioeconomic or cultural status, dyspnea, FEV1 or BMI as determinants of reduced activity, nor dyspnea, FEV1, exercise capacity or exacerbations as outcomes of reduced activity. The second question is how much physical activity is needed to obtain health benefits in sedentary patients with COPD, but individualized physical activity recommendations will probably be more suitable for these patients, adapting the intensity to the patient's aerobic fitness level.¹³ A third question, and challenging one, is whether the decline in PA can be reversed in

patients with COPD.¹⁴ A final problem is the lack of knowledge about the daily PA in the real life of stable COPD patients, and the lack of knowledge about the best tools for PA assessment: self-report, like the Minnesota Leisure Time Physical Activity Questionnaire, or objective measures, such as the use of a pedometer or accelerometry-based motion sensor.

Pulmonary rehabilitation (PR) is regarded as one of the most effective non-pharmacological treatments in COPD patients,¹⁵ with clear benefits in the pre/post-exacerbation setting, but acceptance and uptake of pulmonary rehabilitation following an acute exacerbation are very poor, and many patients refuse referral to post-acute exacerbation PR because of practical or psychosocial barriers.¹⁶ Instead, regular PA is available to all patients. Physical activity, objectively measured,¹⁷ is the best predictor of all-cause mortality in patients with COPD, with a linear association between PA and mortality. As a predictor of mortality, PA is better than BODE or ADO indexes, malnutrition, muscle wasting, healthy status, cardiac function, depressive symptoms or dyspnea. Physical Activity, outside a pulmonary rehabilitation program, such as domestic, occupational and everyday activities for independent living, and physical exercise, inside and outside their homes, in light, moderate or vigorous intensity, can, together with smoking cessation, become the best way of preventing disease progression, comorbidities and exacerbations of COPD. We need pharmacological and nonpharmacological strategies to overcome the difficulties in the implementation of regular physical activity, but improving the patient's self-management education and the relationship of trust between the patient and the physician¹⁸ may be the most important of all.

Conflicts of interest

The author has no conflicts of interest to declare.

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