ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

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ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

ARCHIVES OF HELLENIC MEDICINE 2015, 32(6):797–798
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2015, 32(6):797–798

Pneumonology Quiz – Case 2

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A 75-year-old male patient, lifelong smoker, with a background of chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD) stage 4 and diabetes attended the respiratory outpatient clinic complaining of poor control of his COPD. He suffered a few infective exacerbations per year, which were treated with oral steroids and antibiotics. Fortunately, he had avoided hospital admissions by the time. He was previously followed up by a general practitioner and he was prescribed on a salbutamol inhaler to be used four times a day, as well as when required, and he had been using it at least six times a day in average. He described a very limited exercise capacity, due to breathlessness, which strongly affected his daily activities. On examination, the patient appeared cachectic, tachypnoic at rest and his chest was overexpanded. Pursed lip breathing was also noted. On auscultation his chest was clear. There were no signs of cor pulmonale. Routine bloods did not reveal any pathological results. Chest x-ray only showed overexpansion. Arterial blood gases and spirometry were performed and the results are presented in table 1.

Question 1: Which among the following options would you include in your initial management plan?

a. Prescribe tiotropium
b. Organise a computed tomography (CT) chest
c. Prescribe salmeterol
d. Prescribe salmeterol/fluticasone combination
e. Refer to smoking cessation clinic
f. Further assess for long-term oxygen therapy
g. Refer for pulmonary rehabilitation.

Question 2: Which among the previous options can prolong the survival of patients with COPD?

Question 3: Would you change your management plan if this patient had an elevated jugular venous pressure and a left parasternal heave?

Table 1. Patient's spirometry and arterial blood gases.

Spirometry	Arterial blood gases
FEV_1 – 59% predicted	pH: 7.34
FVC – 101% predicted	pO_2: 57 mmHg
FEV_1/FVC – 53%	pCO_2: 53 mmHg
	HCO_3: 31

Comment

COPD is a chronic debilitating disease, which causes a significant burden to patients and the society. A holistic approach to its management is required and could significantly improve daily symptoms, quality of life, decrease the exacerbation rate and prolong survival. The above-mentioned patient is clearly undertreated. Given that his breathlessness significantly affects his quality of life and that he experiences more than one exacerbation per year, he falls into patient group D according to the new GOLD guidelines. Given their symptoms and high risk of exacerbation, patients of this group should receive regular treatment, which should include either a long acting muscarinic antagonist (LAMA) such as tiotropium, or the combination of a long acting beta-2 agonist (LABA) with inhaled corticosteroid, such as salmeterol/fluticasone, which are considered equally effective and safe. However, tiotropium is contraindicated in patients with severe CKD as they may experience increased cardiovascular adverse effects and mortality, so LABA/ICS combination should be chosen. As far as non-pharmacologic treatment is concerned, smoking cessation should be prioritised, as it can delay disease progression, improve symptoms control and general wellbeing, prolong the survival and minimize the burden from comorbid diseases, including cardiovascular disease. Pulmonary rehabilitation can reduce disease symptoms and hospitalizations, improve quality of life and increase physical and emotional participation in everyday activities, and for this reason all patients with COPD should be referred.[2] Finally, the importance of regular influenza and pneumococcal vaccinations cannot be overstated.

Although several different pharmacologic and non-pharmacologic interventions improve symptoms, exercise tolerance and quality of life, and also decrease exacerbations and hospitalization rate of COPD patients, there are very limited interventions that could prolong survival. Apart from smoking cessation, only long-term oxygen therapy, when indicated, has been proved to prolong survival.[5] Given its impact on survival, the need for long-term oxygen administration should be considered in every patient with COPD. Its indications are presented in table 2. A recent meta-analysis

Table 2. Indications for long-term oxygen administration (PaO_2: Partial pressure of oxygen, SaO_2: Oxygen saturation).

PaO_2 ≤55 mmHg or SaO_2 ≤88% with or without hypercapnia confirmed twice over a three week period
PaO_2 between 55–60 mmHg, if there is also evidence of pulmonary hypertension, congestive cardiac failure or polycythaemia (haematocrit >55%)

suggested that tiotropium may also prolong survival, but data are still controversial.[3,4]

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Answers:
1 – d, e, g
2 – e, f
3 – See indications for long-term oxygen administration

Diagnosis: *Undertreated chronic obstructive pulmonary disease*