

Case studies

It is important to make an accurate diagnosis and provide a more tailored treatment for all of our patients with chronic obstructive pulmonary disease.

The following cases, which represent those which most commonly present to the GP surgery, highlight the need for better understanding and management of this condition.

Case 1

Bob, a 50-year-old happily married builder, was brought to see the GP by his wife because of his snoring. He started smoking at the age of 20 years and has smoked 25 cigarettes per day ever since.

On further questioning he admits to morning cough with clear sputum. He denies symptoms of shortness of breath, and when asked specifically he attributes the cough to his weight and smoking.

There is no history of chest pain or discomfort, or swollen ankles.

On examination the patient's BMI is found to be 35 kg/m², and his blood pressure is 150/90 mmHg. The rest of the routine physical, cardiovascular and respiratory examination is completely normal.

Investigations

- Full blood count – normal.
- Chest X-ray – hyperinflated lungs.
- Spirometry – FEV₁ is 55% of predicted value, and FEV₁/FEC ratio is 0.6.

Management

- The spirometry data confirm an airflow obstruction.
- Perform the bronchodilator reversibility test by giving the patient four puffs of salbutamol via a spacer. This will confirm whether he has COPD or asthma.
- His FEV₁ increases by 120 ml. This confirms that he has COPD.
- Discuss COPD with the patient, and give him lifestyle advice with regard to weight reduction, increasing exercise and smoking cessation.
- Blood pressure management. Aim for a reading of less than 150/90 mmHg.
- Fasting cholesterol and blood sugar levels must be checked.
- Calculate the patient's cardiovascular risk, and if it is greater than 20% over the next 10 years, discuss statin therapy. Simvastatin for primary prevention at a dose of 40 mg is more cost-effective.
- For symptomatic relief, issue a short-acting β_2 agonist (e.g. salbutamol), to be taken four times per day.
- Demonstrate to the patient how to use an inhaler.
- Arrange a follow-up appointment in 4–6 weeks. If the patient is still symptomatic at that time, add an anticholinergic inhaler.
- Check the patient's inhaler technique.

Six-month review

- Measure BMI.
 - Measure blood pressure.
 - Make sure that the patient has stopped smoking.
 - If he is asymptomatic, continue with the above management.
 - If he is symptomatic, add a long-acting β_2 agonist (salmeterol or formoterol) or a long-acting anticholinergic (tiotropium).
 - Repeat the FEV₁ measurement in 12 months' time.
 - Arrange for the patient to have a pneumococcal vaccination.
 - Emphasise the importance of having a yearly influenza vaccination.
- Arrange follow-up on a 6-monthly basis.

Case 2

Raymond is a 62-year-old retired engineer. Over the past 18 months he has noticed increasing cough, tightness of his chest and occasional white

phlegm. On further questioning he complains of wheezing most days and occasionally at night, causing him disturbed sleep.

He smoked until the age of 40 years, and his total tobacco usage was 14 pack years. His mother had hay fever and eczema.

Raymond has no allergies and has never had any pets.

Examination

Completely normal.

Investigations

- Spirometry showed an FEV₁ of 60% of the predicted value and an FEV₁/FEC ratio of 0.55.
- The peak expiratory flow rate (PEFR) is reduced to 350 litres/minute (predicted value is 440 litres/minute).
- The bronchodilator reversibility to salbutamol increases the FEV₁ to 12%.

Management

- The possible diagnoses are COPD or asthma.
- The spirometry data confirm airflow obstruction.
- The use of tobacco and the small reversibility to salbutamol would suggest COPD.
- The history of wheezing and family history of allergy are more indicative of asthma.
- Suggest PEFR monitoring twice daily at home, morning and evening.
- Look for diurnal swing.
- Initiate a trial of prednisolone 30 mg daily for 2 weeks with home PEFR monitoring, and observe the increase in the PEFR.
- Check the symptoms. If they disappear, the diagnosis is late-onset asthma.
- Repeat the spirometry, checking the FEV₁ value.

In Raymond's case, after 5 days of prednisolone treatment, the PEFR started to increase until it reached a value of 400 litres/minute. The repeat FEV₁ measurement was 90% of the predicted value. The patient became asymptomatic.

Diagnosis

Late-onset asthma.

Management

According to asthma guidelines.

Case 3

Sarah, a 70-year-old woman, was diagnosed with COPD 4 years ago. She was a smoker, but stopped 2 years ago with her practice nurse's support.

During the last 6 months she has had two acute attacks that required antibiotics and steroids, both given by the locum doctor while you were on holiday. No follow-up appointment was made on either of these occasions.

Sarah asked for an emergency appointment and attended with a history of 'another bad chest', requesting yet another course of antibiotics and steroids.

She also complained of increased sputum every morning and mentioned that her walking distance was less than 50 yards.

On checking the records, you find that she did not attend her three spirometry appointments and that she also did not attend her influenza vaccine appointment.

Her last FEV₁ was performed 18 months ago and was 35% of the predicted value.

She is also non-compliant with her inhalers (the most recent prescription for salbutamol and tiotropium was issued 3 months ago).

Management

- It is all too easy to enter an exception code and remove the patient from QOF indicators. However, Sarah is the kind of patient who needs education, optimisation of inhaler treatment and regular follow-ups. If she is struggling to attend your surgery, add her name to your regular home visit list.
- Aim to reduce the frequency and severity of exacerbations by providing a long-acting bronchodilator, a combination inhaler of long-acting β_2 and inhaled corticosteroid, mucolytic agent and pulmonary rehabilitation.
- Introduce a self-management plan with clear instructions with regard to the action plan.

- Check the patient's pneumococcal immunisation status and emphasise the importance of having the influenza vaccination every year.
- Involve social services in providing home help.
- Assess the need for oxygen therapy.

Three-month follow-up

- Sarah is able to do her housework.
- She is complying with her inhalers and has not had an acute attack.

Case 4

Charlie, a 67-year-old retired shopkeeper, presents with a history of slowly worsening breathlessness and wheezing when walking uphill or up stairs. He has no problems walking on the level ground. There is no history of morning cough or sputum, night symptoms, or chest pain, discomfort or tightness.

He admits to sleeping with two pillows.

Prior to retirement, he was exposed to asbestos dust for 3 years as an employee.

He remembered being chesty as a child and had eczema in childhood.

Examination

The patient's chest and cardiovascular examination were normal.

Investigations

- BMI was 34 kg/m².
- Chest X-ray and ECG were both normal.
- Spirometry – FEV₁ was 70% of the predicted value and the FEV₁/FVC ratio was 36%.
- Peak expiratory flow rate showed little diurnal or day-to-day variation.

Management

- The differential diagnosis in this patient includes heart failure, chronic obstructive pulmonary disease and exercise-induced asthma.
- Perform an exercise test and check the peak expiratory flow rate before exercise and then at 10-minute intervals for 40 minutes.
- If the result of the exercise test shows that the patient's peak expiratory flow rate readings are not significantly altered by exercise, exercise-induced asthma can be ruled out.

- Heart failure can be ruled out by performing an echocardiogram.

Charlie was diagnosed with COPD.

He was started on a short-acting inhaled beta-agonist and was reviewed 1 month later. He was advised to stop smoking and to lose weight, and he was encouraged to join a locally organised exercise class.

Case 5

Gillian, a 45-year-old woman who smoked 40 cigarettes a day, presented with cough during a busy Monday morning surgery. She was given a course of antibiotic for a bad cough symptom last month. She attended this time hoping to be given a similar course.

She suffered from childhood asthma and thought that it had flared up again.

Her records revealed that she was not on any inhalers.

Spirometry showed an FEV₁/FVC ratio of 0.68.

Management

- Perform reversibility testing to establish whether this patient has COPD or asthma.
- A 6-week course of inhaled corticosteroids or a 2-week course of oral corticosteroids could be a useful test.
- Smoking cessation would be the most effective intervention in this case.
- Emphasise that it is never too late to stop smoking, and that the benefits start immediately. Offer nicotine replacement therapy, bupropion or varenicline.
- Start with a short-acting bronchodilator, either a β_2 agonist or an anticholinergic.
- Review regularly and step up the dose if necessary.

KEY POINT

- As a primary care physician, it is important to assess each patient appropriately, rather than doing the minimum necessary to gain QOF points.

Short case scenarios: which inhaler?

1 A 58-year-old woman has presented with symptoms of COPD on ipratropium two puffs four times a day for the last 2 years. She complains of shortness of breath when climbing the stairs, intermittent wheezing and a tight chest.

She is struggling to do her shopping.

The FEV₁ value is 60% of the predicted value, and the FEV₁/FVC ratio is 55%.

Management

- Add tiotropium 18 mcg once daily inhaler.
- Prescribe a salbutamol metered-dose inhaler to be taken on an 'as needed' basis.
- If the patient is still symptomatic, add a long-acting β_2 agonist twice daily.

2 A 65-year-old man with COPD attends the GP surgery asking for a course of antibiotic.

During the last 8 months he has attended the walk-in-centre, out-of-hours service and Accident and Emergency department with worsening breathlessness and yellow sputum with cough.

He is on salmeterol 50 mcg twice daily and tiotropium 18 mcg once daily.

Management

- This is 'frequent exacerbation.'
- Add Seretide 250 Accuhaler (salmeterol 50 mcg plus fluticasone propionate 250 mcg) to be taken twice a day, or Symbicort Turbohaler 200/6 (budesonide 160 mcg plus formoterol 4.5 mcg per metered inhalation) to be taken twice a day.
- Increase the dose depending on symptom relief.

3 A 70-year-old man with severe COPD has noticed that he has swollen ankles.

The FEV₁ is 28% of the predicted value and the FEV₁/FVC ratio is 40%.

He takes tiotropium 18 mcg once daily, salmeterol 50 mcg twice daily and salbutamol on an 'as needed' basis.

During his last exacerbation 4 weeks ago he was given oral prednisolone, 30 mg, and he continues to take 10 mg daily.

Management

- This is respiratory failure.
- Check the patient's BMI and nutrition.
- Perform pulse oximetry.
- Assess the patient's need for long-term oxygen therapy.
- Add a combination inhaler (Symbicort or Seretide).
- Refer the patient for pulmonary rehabilitation.