The role of spirometry in the management of obstructive airways disease: How pharmacists should get involved

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Patient case

Your patient, PR (a 50-year-old man who is an ex-smoker), comes in to renew his short-acting β_2 -agonist (SABA). His physician has told him he has asthma. He has been getting his SABA from your pharmacy for only the past year or so and has a combined inhaled corticosteroid and long-acting β -agonist (ICS/LABA) on file. You know that you are supposed to do several things here: assess his asthma control (daytime and nighttime symptoms, exacerbations, etc.), ensure that his inhaler is being used correctly, review other medications he is taking and consider possible triggers. You consider the SABA use in context of his other medications and wonder why he has come in for an inhaler only 1 month after the last one. Does that not mean his asthma may be out of control? Why isn't he filling his ICS/LABA prescription? All these questions are important, but your *first* step should be to confirm his diagnosis, as choice of appropriate therapy is dependent on an accurate diagnosis. So, your first question is: "Does the patient have asthma, chronic obstructive pulmonary disease (COPD) or another lung problem altogether?" If the patient has never had an objective measure of pulmonary function, perhaps this should be the first step?

Background

The diagnoses of the most common obstructive airway diseases—asthma and COPD—are made with a clinical history and an objective measurement of lung function—spirometry. Unfortunately, spirometry is significantly underutilized in primary care, with estimations of only about 50% to 60% of patients having had a single spirometry in the management of their asthma¹ or COPD.^{2,3}

Although the words are often used interchangeably, it is important to note that there is a difference between *spirometry*

and *pulmonary function testing* (PFT). Spirometry is a diagnostic tool that can be performed anywhere by a properly trained health care professional. A simple pre- and postspirometry test can help diagnose asthma and COPD; however, beyond these 2 diseases, a person may require a full PFT that can look into lung volumes and diffusion capacity to help decipher restrictive lung diseases, such as pulmonary fibrosis.

With the many pressures in primary care, patients with respiratory symptoms are often given treatment empirically (without a full diagnostic workup that includes spirometry) and often for many years. This lack of testing may seem convenient to both the patient and the clinician at the time; however, it is not the best practice. Patients may be needlessly exposed to possible adverse outcomes and costs, which may not only affect themselves but also the health care system. Although giving a trial of therapy as a means of confirming the diagnosis of asthma may seem like a rational strategy,⁴ a trial of therapy that treats symptoms does not necessarily confirm a diagnosis. There must be objective measurement of the treatment response, to avoid undertreatment, overtreatment or frankly erroneous treatment. Therefore, follow-up is essential. There are many studies that unfortunately show diagnostic error in obstructive airway diseases in primary care.^{1,5} There are several reasons for this, some as simple as gender bias (expecting that males will have COPD while females will have asthma).⁶

Many patients with diagnoses such as pulmonary fibrosis⁷ and α_1 -antitrypsin (AAT) deficiency⁸ are often treated for years with inhalers, not with treatments that actually help their underlying conditions. Diagnosis of COPD is often made late in the course of the disease, and despite symptoms such as cough, wheeze, dyspnea, sputum or frequent respiratory tract infections, tests are not performed.⁹

As with anything, there are barriers¹⁰ to the use of spirometry in routine practice. Barriers can be categorized as patient related, practice related, practitioner related and system related. From the patient's perspective, there are numerous requirements for optimal performance, including maximal inspiration, maximal effort and the absence of interfering factors such as chest pain, cough, poor lip seal or variable effort. Although good coaching is essential while performing spirometries, this does not always occur in practice. From a system perspective, access to laboratories that perform pulmonary function testing is limited and quite varied by geographic region. Hospital-based laboratories therefore often have long waiting lists, although a few have spirometry available on a walk-in basis. Even when testing is done, time needed for interpretation may delay results from reaching the clinician in a timely manner. Practice-related problems include the challenges of timing (both of medications used prior to the visit as well as SABA use prior to testing), particularly when bronchodilator reversibility testing is included, administering the SABA and documenting the effect of the medications for diagnosis, the unpredictable timing of when the test is required in the practice day and the availability of trained personnel to perform spirometry. From the practitioner's point of view, any test must be undertaken with the confidence that it can be performed and interpreted reliably and can support an accurate diagnosis. Although performing spirometry in the patient's home would remove many of these barriers, it does not make fiscal sense to clinicians, as the machines and testing materials are expensive in terms of both resources and time.

Solutions

With these thoughts in mind, there are methods to alleviate these barriers.¹¹ Knowing where to send your patients for spirometry testing is imperative. Further to this, pharmacists should consider arranging spirometry testing at the point of contact, along with participating in training programs themselves, to understand how to perform or evaluate spirometry. It is important to note that pharmacists would not be responsible for interpreting the tests themselves, as they would not be qualified to provide the diagnosis. It would be expected that pharmacists would collaborate with primary care providers.

There have been a number of initiatives regarding the performance of spirometry within pharmacies, with the test results being sent to the physician for information and/or interpretation. Absence of obstruction on spirometry rules out COPD, while reversibility of obstruction generally suggests a possible asthma component. COPD case finding by spirometry, in high-risk patients of urban community pharmacies, has been proven feasible in a variety of pilot studies.¹² Pharmacists see many high-risk, middle-aged patients who have never been tested for COPD and, as mentioned already, are in a great position to help with early detection of COPD if they

are properly trained. Obtaining the correct diagnoses with spirometry testing can help to readily identify improper drug regimens, which can allow the pharmacist/physician team to work toward providing optimal drug therapy options for their patients.¹³ Of note, 80% of the subjects in the referenced trial were able to have any unnecessary drug treatments discontinued or changed to more appropriate choices. Timely use of spirometry can also help to predict the need for respirologist referral and further diagnostic testing.

There are several Canadian initiatives to support advanced respiratory disease education, as well as proper performance of spirometry. The Canadian Network for Respiratory Care runs a certification examination for Certified Respiratory Educators, with training/exam preparation courses available through RESPTREC (www.resptrec.org) and PEAR HealthCare Solutions available (www.healthlearning.ca). Special training for performing spirometry can be done through the SPIROTrec course also available through RESPTREC, as recommended in the 2013 Canadian Thoracic Society guidelines for spirometry in primary care (www.respiratoryguidelines.ca).

We believe that patients should be objectively tested to ensure appropriate diagnosis and treatment. Patients who have been diagnosed with asthma or COPD who have not had spirometry performed at least once should ask their primary care provider to have this test completed.¹¹ While many barriers to spirometry may still exist in practice, a cooperative approach with pharmacists can certainly help in this regard. Pharmacists can collaborate either by contacting the physician to recommend spirometry, performing it themselves and/or, in certain jurisdictions, ordering the test themselves.

We are proposing a pharmacy-based initiative to educate patients and other care providers about the need for spirometry. The need for an objective measurement of lung function has become very apparent. Ensuring that the diagnosis is accurate is the first step in managing any condition. Sometimes, pressure for behavioural change in clinicians needs to be created from a different position. Working together with the Canadian Pharmacists Association, the Respiratory Medicine Program Committee of the College of Family Physicians of Canada and the Family Physician Airways Group of Canada, we propose a pharmacy-driven initiative to do just that. We can create a patient-centric demand to have spirometry ordered for anyone who may require it. Another consideration is for community pharmacy-based initiatives to provide spirometry in their locations to augment any pharmacotherapeutic care they are providing. Canadians often see their pharmacists more often than they do their physicians and have a trusted relationship with them.

Furthermore, as it is already common practice for handouts to be given to patients when they pick up their medications at their community pharmacy, a handout has been created to be given to all patients who are being prescribed respiratory medications. The purpose of this handout is to ask patients if

FIGURE 1 Patient information sheet

Asthma is a chronic condition that involves swelling of the tissues in the airways (i.e., inflammation). It is caused by triggers (e.g., pollen, dust, scents) that irritate the lungs, causing symptoms such as cough and shortness of breath. Chronic obstructive pulmonary disease (COPD) is related to lung damage that may have been caused by things like smoking, biomass fuels, infections and/or genes. The symptoms of COPD can be similar to asthma, however, they are chronic and do not go back to normal.

Both asthma and COPD should be diagnosed by doing a lung test called “spirometry” that involves blowing air into a machine with full force and speed. The amount of air blown out is measured and then compared to a second reading that is done after giving a medication called a bronchodilator (a medication that opens up the airways, such as salbutamol [Ventolin] and terbutaline [Bricanyl]).

You have been prescribed a medication (probably an inhaler) to help you with your breathing or other symptoms. Your diagnosis should be confirmed by a spirometry test if you haven’t had this done yet.

By asking to get this test from your doctor, you can make sure that you are taking the best medication for your condition.

they have ever had a basic lung test (spirometry) and, if not, to ask their physician to arrange one for them (Figure 1; see Appendix 1 for a full-page handout, available at the online version of the article).

Back to the patient case

In the case of PR, we need to find out what his actual diagnosis is before we can offer the best treatment recommendations. After referring him back to the physician for a simple spirometry, we find out that he actually has COPD, not asthma. This changes the treatment plan entirely. If we had just blindly proceeded with the “asthma” diagnosis at face value, we would have continued to encourage our patient to use his ICS/LABA to get better control. Although the LABA component in the ICS/LABA combination would have helped to open his airways, it technically would have been an inappropriate first choice for our patient (i.e., nonexacerbating COPD). In essence, use of the ICS/LABA without need for the ICS would potentially be adding unnecessary risks and adverse effects to the patient that could have been prevented.¹⁴ This

demonstrates the importance of spirometry in diagnosis and that history/symptoms alone are not enough to give us the full diagnostic picture. Now that we know that PR has COPD, not only does this change our pharmacotherapeutic recommendations but also means the patient could have missed an important opportunity to be tested for AAT deficiency and be referred for pulmonary rehabilitation. Missing the simple step of spirometry can have detrimental effects on the entire patient care outcome.

Conclusion

We need to make firm diagnoses a priority for our patients. One would not diagnose hypertension without measuring blood pressure or diabetes without checking blood sugar levels, but respiratory symptoms are often treated empirically. We can do better, and pharmacists can play a major role in affecting this change. Whether pharmacists are performing, ordering the test themselves or advocating for or educating patients, they will be helping to improve respiratory care on a national scale. Let’s work together to make this happen! ■

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