Chest & Heart Journal
Vol. 34, No. 1, January 2010

CASE REPORT

COPD in Female as Frequent Misdiagnosis - A Case Report

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Abstract:

Misdiagnosis of asthma in a case of COPD is not infrequent, specially if the patient is a female one. Careful history taking, performing proper physical examination and finally judicious investigation helps in the appropriate diagnosis. DLCO (Diffusing capacity of lung for carbonmonoxide) is the choice of test to differentiate COPD from asthma if it is not possible to differentiate the two separate entity from history, physical examination and other investigations.

[Chest & Heart Journal 2010; 34(1) : 62-65]

Introduction:

What is COPD: COPD is defined as a preventable and treatable lung disease with some significant extrapulmonary effects that may contribute to the severity in individual patients. The pulmonary component is characterised by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases. Related diagnoses include chronic bronchitis (cough and sputum on most days for at least 3 consecutive months for at least 2 successive years) and emphysema (abnormal permanent enlargement of the airspaces distal to the terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis). Extrapulmonary manifestations include impaired nutrition, weight loss and skeletal muscle dysfunction. *[1]*

Pathophysiology and pathology of COPD: COPD is a progressive condition characterized by inflammation of airway mucosa associated with mucus gland hypertrophy, hyperplasia of goblet cells, and destruction of alveolar septae with a reduction of diffusing surface area .[2]

Diagnostic tools: Despite the widespread incidence and seriousness of COPD, studies strongly suggest that it is under diagnosed, especially in women. The list of diagnostic tests mentioned in various sources as used in the diagnosis of COPD includes: lung function tests including diffusing capacity of lung for carbonmonoxide (DLCO), chest imaging, arterial blood gases etc.

Why DLCO is reduced in COPD but increased in asthma: The diffusing capacity (DLCO) is a test of the integrity of the alveolar-capillary surface area for gas transfer. It may be reduced in disorders that damage the alveolar walls (septa) such as COPD. But it is increased or remains normal in asthma. There was a significant difference in DLCO values between patients with COPD and asthma. The decreased DLCO may be directly related to the loss of alveolar-capillary surface area that is associated with emphysema.

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Case report:

A 44-year-old woman who presents in the OPD of National Asthma Centre, NIDCH, Dhaka, with shortness of breath over the last 2 years. She noticed a recent limitation in her exercise tolerance especially when she works hurriedly.

She has also been having daily morning cough with some sputum production and wheezing. As a child, she had several episodes of cough and wheezing and 3 years ago she was told she had asthma by a physician. She was given combination preventer inhaler and oral montelukast to use, but despite she has been taking regular medication, her symptom doesn't relieved. Her medical history is notable for allergies and hypertension. Her hypertension is controlled by salt restriction, and she does not currently require treatment for her allergies. Of note, she used to cook with biomass solid fuel fires in the last 20 years. Her father had lung cancer and died from lung cancer, were heavy smokers.

On physical examination, she has some decreased breath sounds and some scattered rhonchi, but otherwise her examination is unremarkable.

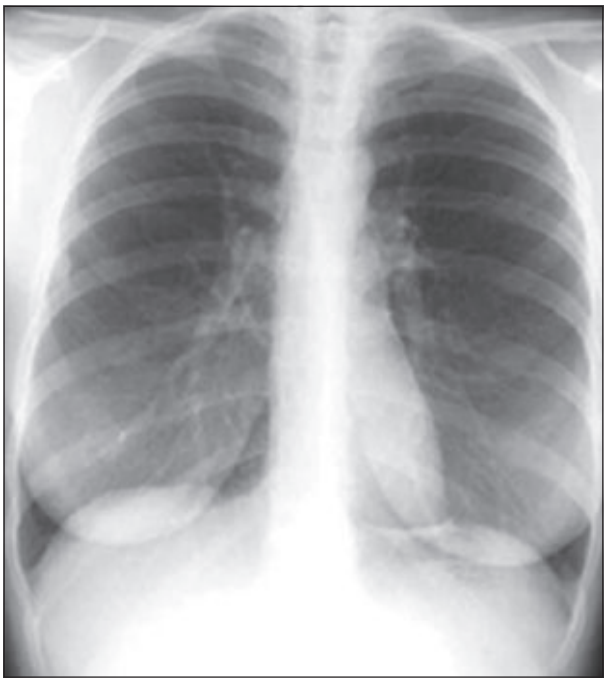

Fig.-1: CXR PA view

Her routine investigation like CBC, RBS, etc are unremarkable. Spirometry shows mild obstructive ventilatory defect with insignificant reversibility component. DLCO was done and found significant reduction of DLCO.

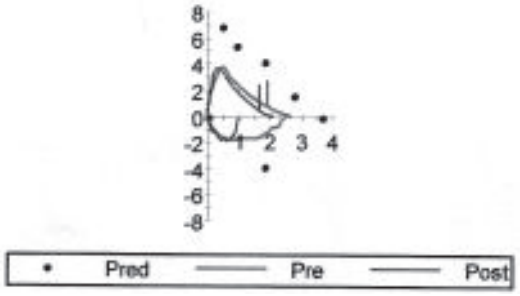

Fig.-2: *Spirometry*

Discussion:

This type of case is actually fairly common and is very characteristic of COPD. However, we as clinicians had for many years the tendency to label a woman presenting with symptoms as such having asthma rather than COPD because we erroneously thought of COPD as a disease limited to old men. Now we know that that is not correct. This patient having onset of symptoms has largely occurred later in life. She is middle-aged, and her exposure to biomass solid fuel fires and passive smoking history should tip off the clinician to the possibility of a diagnosis of COPD. Certainly her history of " several episodes of cough and wheezing " as a child and allergies should also trigger a potential diagnosis of asthma.

Differentiating between asthma and chronic obstructive pulmonary disease (COPD) remains clinically challenging but is essential to the appropriate management and the optimization of clinical outcomes in patients.[1] Although both COPD and asthma are associated with chronic inflammation of the respiratory tract, the inflammatory cells and mediators involved in disease processes differ significantly even though many of the presenting symptoms, such as cough and shortness of breath, are similar.[1]

Without proper investigation, it is sometimes hard to differentiate between COPD from asthma. COPD symptoms rarely start in individuals who are less than 40 years of age, although certainly loss of lung function may be occurring before then. So symptom onset during middle age in this patient who was a house wife with a history of prolonged passive smoking and cooked with biomass solid fuel fires for the last 20 years favors a diagnosis of

COPD. Could she have had asthma as a child? Sure, she could have had asthma, and in fact people with asthma are not immune from getting COPD if they are heavy smokers. In fact, some epidemiologic studies suggest that those with asthma may be at higher risk for COPD developing if they are exposed to smoke than the general population, although this remains a controversial issue.[3]

Obviously, not every patient who reports shortness of breath or exercise limitation has asthma or COPD; there are other potential diagnoses that need to be considered . Being a pulmonologist, I always think about lung disease first. But one should always rule out the presence of cardiac disease such as heart failure because it can also present with shortness of breath on exercise. However, it's sometimes very hard to completely be sure, and further workup of the patient, including a physical examination and lung function tests like spirometry, is usually needed.

Both asthma and COPD are obstructive airway diseases, which can be demonstrated with spirometry. Therefore, the presence of airway obstruction does not favor a diagnosis of one over the other.[4]

Often we talk about a patient's acute bronchodilator response when doing spirometry. In the past, we thought that a patient's significant bronchodilator response — that is, having significant reversible airway obstruction (change in FEV_1 by 12% and 200 mL from baseline) — confirmed a diagnosis of asthma and ruled out COPD.[1] However, we now know that this is not accurate and that it may lead to underdiagnosis of many patients with COPD. Studies have now demonstrated that acute bronchodilator reversibility does not really help differentiate asthma from COPD because a substantial number of patients with COPD may actually demonstrate acute bronchodilator response.[5] A postbronchodilator FEV_1/FVC ratio of < 0.7 favors the diagnosis of COPD.[1] In this case, spirometry revealed a predicted FEV_1 of 60% and FEV_1/FVC of 0.56 but did not demonstrate significant acute bronchodilator reversibility. In fact, her response after the bronchodilator decreased by 8%, which is in line with a diagnosis of COPD. However, to be clear, even if had a significant postbronchodilator response to salbutamol, this would not have ruled out a diagnosis of COPD.

The point here is the diagnostic implication using spirometry. Yes, it is important, so why do we do spirometry here for both asthma and COPD? We do spirometry to confirm airway obstruction but also to stage the disease. We don't do it to differentiate asthma and COPD. Staging asthma and COPD severity is very important to guide management of both these diseases. COPD demonstrated significantly decreased DLCO when compared to asthmatic patients [6].*So DLCO is the test of choice to differentiate COPD from asthma.*

This case was diagnosed with moderate disease on the basis of her history and spirometry value. Current guidelines advocate using inhaled long-acting bronchodilators (eg, long-acting beta 2-agonists or anticholinergics) as first-line therapy in such a case.

On the other hand, if her diagnosis was asthma, inhaled corticosteroids should be considered as first-line treatment of her disease and these should be instituted as early as possible in all patients with mild-to-persistent disease.[7] The response to inhaled steroids in asthma and COPD is different based on the fact that airway inflammation in asthma is generally eosinophilic in nature (steroid responsive) while neutrophils play a major role in airway inflammation in COPD and the response to inhaled steroids is not as significant.

Although there is a major role for inhaled corticosteroids in COPD, they are usually added onto a long-acting bronchodilator.[1] Therefore, a major distinction between asthma and COPD regarding therapy is that in asthma the platform for treatment is inhaled corticosteroids; then one should consider adding the long-acting beta 2-agonists if the patient doesn't adequately respond to inhaled corticosteroids alone.[4] In COPD, the platform for treatment is an inhaled long-acting bronchodilator, and inhaled corticosteroids are usually advocated in patients with severe disease, like those with an FEV_1 of < 50% and in those patients with history of recurrent exacerbations.[1]

However, if a clinician cannot easily differentiate between asthma and COPD in a patient, current guidelines suggest treating such a patient as a case of asthma and advocate using inhaled corticosteroids early.[1] In this case, we have the confirmation that she has moderate COPD and

thus it is not unreasonable to start treating her with an inhaled long-acting bronchodilator. However, on follow-up, if she starts experiencing flare-ups (ie, exacerbations), then we should consider adding an inhaled corticosteroid to her long-acting bronchodilator at that point.

Conclusion:

There is a great deal of overlap between asthma and COPD, and some similarities exist in both diseases. However, they are two different, distinct diseases, and differences in the clinical presentations, pathophysiology, triggers, and course of the diseases are well recognized. In differentiating asthma from COPD the very basic fact that a detailed history is needed. In patients with asthma, the trigger is usually an allergen, though in COPD is smoking (active/passive) biomass solid fuel fires . Spirometry is important for the diagnosis and staging of both diseases, but the presence of significant acute bronchodilator response is not always helpful in differentiating one disease from the other. Here DLCO is the choice of test.

References:

1. Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2008. Available at: http://www.goldcopd.org Accessed: May 2, 2010
2. Joules D, Glassrothe J. Obstructive lung disease. In: Text book of pulmonary disease. 7th edition Gerald L Baum editor in chief Little Brown & Company 2004. 554.
3. Lange P, Parner J, Vestbo J, Schnohr P, Jensen G. A 15-year follow-up study of ventilatory function in adults with asthma. N Engl J Med. 1998;339:1194-200.
4. Richter DC, Joubert JR, Nell H, Schuurmans MM, Irusen EM. Diagnostic value of post-bronchodilator pulmonary function testing to distinguish between stable, moderate to severe COPD and asthma. Int J Chron Obstruct Pulmon Dis. 2008;3:693-699.
5. Tashkin DP, Celli B, Senn S, et al. A 4-year trial of tiotropium in chronic obstructive pulmonary disease. N Engl J Med. 2008;359:1543-1554.
6. B. A. Sin1, Ö. Akkoca2, S. Saryal2, F. Öner1,Z. Mýsýrlýgil1 Differences between asthma and COPD in the elderly, *J Investig Allergol Clin Immunol* 2006; Vol. 16(1): 44-50.
7. Calverley PM, Burge PS, Spencer S, Anderson JA, Jones PW. Bronchodilator reversibility testing in chronic obstructive pulmonary disease. Thorax. 2003;58:659-664.