

COPD CASE PRESENTATION

Continuing Medical Education

1 CME CREDIT

Physicians
Physician Assistants
Nurse Practitioners

College Softball Player

A 22-year old college student presents to your office with a history of increased shortness of breath with sports activities. She is asymptomatic at other times. She has been actively involved in her college women's softball league where she plays softball once a week. She now tells you that for the past three months she has had difficulty "running the bases" and jogging once a week during their games. She does not report any wheezing or increased sputum production. She does cough occasionally when she gets short of breath.

Her past medical history confirms that she has been essentially healthy most of her life. She has had the usual childhood diseases and all her immunizations are up to date. She smokes half a pack of cigarettes per day, and has done so since age 15. She currently lives in an apartment with two other roommates, both of whom smoke. There is a pet cat in the apartment.

Both her parents are alive and in good health. Her mother smokes one pack of cigarettes per day, and has done so for the past 20 years.

LEARNING OBJECTIVES

Those completing this activity will receive information that should allow them to...

- Correctly make a diagnosis in a 22-year old female with shortness of breath;
- Differentiate between asthma and an allergic reaction; and
- Develop and implement a plan to treat asthma in a young and active patient who smokes.

EXAMINATION

Vital Signs	T: 98.0 F HR: 70 RR: 12 Pulse: 64 BP: 120/80
Physical Exam	HEENT: Normal Height: 65 in. Weight: 125 lbs.
Chest	Lungs are clear and equal bilaterally to auscultation and percussion.
Cardiac	A regular rate and rhythm is noted with no murmurs
Abdomen	Her abdomen is soft with no masses
Extremities	No edema, No masses and No clubbing
Physical examination reveals a healthy college student in no distress.	
An electrocardiogram and chest x-ray performed in your office are both normal. Laboratory studies reveal a normal CBC and differential	

 UNIVERSITY of NORTH TEXAS
HEALTH SCIENCE CENTER
AT FORT WORTH

Valid 12.01.2008-12.01.2009



PRE-ASSESSMENT

LABORATORY

1

You perform pulmonary spirometry in your office and discover that all parameters are within normal limits. Based on these pulmonary function tests, you can correctly surmise that:

- A. You have ruled out the diagnosis of asthma
- B. You have ruled out the diagnosis of emphysema
- C. You have ruled out the diagnosis of sarcoidosis
- D. You have ruled out the diagnosis of alpha 1 – antitrypsin deficiency
- E. None of the above

2

You wonder whether allergies may be a factor in her diagnosis, and you correctly order:

- A. A nasal smear for eosinophils
- B. A circulating eosinophil count
- C. A CBC with a differential
- D. A serum IGG level
- E. A serum IGE level

DIAGNOSIS

3

You still strongly suspect a diagnosis of reversible obstructive airway disease in your patient. At this point, the best test to confirm that diagnosis would be:

- A. A methacholine challenge
- B. An exercise challenge
- C. Whole body plethysmography in a “body box”
- D. A trial of systemic steroids to see if she notices any improvement
- E. An alpha 1 – antitrypsin level

TREATMENT

4

After performing the correct test, you correctly diagnose exercise induced asthma. Based upon that treatment, and the current guidelines for asthma therapy, you correctly begin your therapy with:

- A. Oral Theophylline daily
- B. A fluticasone/salmeterol inhaler taken twice daily
- C. An inhaled corticosteroid
- D. A leukotriene inhibitor taken daily
- E. An inhaled Beta 2 agonist one-half hour prior to exercise

COUNSELING & FOLLOW-UP

5

Your patient does well with your treatment recommendations. You are concerned about her smoking, and correctly:

- A. Advise her to start chewing nicotine gum
- B. Prescribe bupropion for her
- C. Prescribe varenicline for her
- D. Prescribe a nicotine nasal spray
- E. In a clear, strong and personalized manner, advise her to quit





ACTIVITY TITLE:	College Softball Player Case Presentation
DATES VALID:	December 1, 2008 – December 1, 2009
CREDITS AVAILABLE:	1 Category 1 PRA AMA Credits™, 1 Hour Category 2B, AOA

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QUESTION RESPONSES					
Q #	A	B	C	D	E
1	(A)	(B)	(C)	(D)	(E)
2	(A)	(B)	(C)	(D)	(E)
3	(A)	(B)	(C)	(D)	(E)
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PROGRAM EVALUATION						
Scale: P=Poor F=Fair G=Good VG=Very Good E=Excellent						
LEARNING OBJECTIVES		P	F	G	V G	E
1	Correctly make a diagnosis in a 22-year old female with shortness of breath;	(1)	(2)	(3)	(4)	(5)
2	Differentiate between asthma and an allergic reaction; and	(1)	(2)	(3)	(4)	(5)
3	Develop and implement a plan to treat asthma in a young and active patient who smokes.	(1)	(2)	(3)	(4)	(5)
CONTENT						
4	To what extent this activity is fair and balanced.	(1)	(2)	(3)	(4)	(5)
5	Likelihood that you will implement change in your practice based on information from this activity.	(1)	(2)	(3)	(4)	(5)
6	Your OVERALL rating of this activity.	(1)	(2)	(3)	(4)	(5)
PRACTICE						
7	I am better equipped to educate my patients regarding COPD.	(1)	(2)	(3)	(4)	(5)
8	I am better equipped to help my patients set realistic expectations during treatment.	(1)	(2)	(3)	(4)	(5)
9	I am better equipped to recognize and diagnose COPD.	(1)	(2)	(3)	(4)	(5)
10	I am better equipped to educate my patients on pharmacologic and non-pharmacologic therapies for COPD.	(1)	(2)	(3)	(4)	(5)
11	What is your greatest challenge when treating COPD?					

SIGNATURE

DATE

DISCUSSION



The history of this case is not unusual. Complaints of increasing shortness of breath in young adults can have a variety of possible causes. In this age group cardiac causes (undiagnosed congenital heart defects or valvular disease) may present as exercise induced shortness of breath. In this case, the normal physical examination, EKG, and chest x-ray make these highly unlikely. Her normal CBC indicates that anemia is not the cause for her exercise based shortness of breath. The next most likely diagnosis would generally come from a pulmonary etiology.



one The question indicates that you are strongly considering a pulmonary cause of her shortness of breath and order spirometry to assist you in your diagnosis. In this case, her spirometric studies are all normal. Does this mean she doesn't have a pulmonary cause for her exercise induced shortness of breath? Not at all. Many pulmonary disorders may have normal baseline pulmonary function tests. Reversible obstructive airway disease (asthma) is certainly among them. Depending on the nature of a patient's asthmatic condition, many patients with intermittent airways disease will have perfectly normal spirometry until they are exposed to a trigger that will induce bronchial edema and airway tightening.¹ During an acute episode, you would definitely see abnormal spirometry, but remember our patient has a completely normal physical exam and she is asymptomatic. To rule out early alpha 1 – antitrypsin deficiency, the best test would be to look directly at alpha 1 – antitrypsin levels.² Answer E – None of the above is correct in this case.

two This question indicates that you are considering a possible allergic trigger as a component of her shortness of breath. Perhaps there are stacks of hay near her softball field, or maybe she has a strong pollen allergy. Although eosinophilia is often associated with allergic conditions, eosinophil levels are not always found elevated in allergic conditions every time. In addition, there are many syndromes that are not allergic in nature that may have elevated eosinophil counts. Examples include eosinophilic pneumonias and parasitic infections. Many adult onset asthmatics will demonstrate elevated eosinophil counts during an acute attack and have no classical allergies. Of the choices listed among the answers, an increased serum IGE level, would be the best indicator of an allergic component in this particular patient and be far more selective for allergies than increased eosinophils in her CBC or from a nasal smear. Answer E is the correct answer. Of all the tests listed, it would provide the best information in determining the presence of an allergic component.³



three Answer A, a methacholine challenge, would present the best evidence that this patient suffers from asthma. Although everyone would eventually be made to wheeze if enough methacholine were administered, asthmatics demonstrate exquisitely high sensitivity to methacholine administration and will begin to drop their pulmonary function parameters after the administration of very small dosages of this agent. Although an exercise challenge may produce a positive result in this patient, the question asks for the "best" test to be performed in order to diagnose asthma; a methacholine challenge is far more sensitive and specific than an exercise PFT. Whole body plethysmography is a method to determine airway resistance and this test is performed in sophisticated pulmonary function laboratories. Although a measurement of airway resistance, and reversibility would help your diagnosis, a more definitive test, in this case, and thus the best answer would be a methacholine challenge. Performing the methacholine challenge test is not without risk. In essence you are inducing an attack of airway obstruction and inflammation, and must be ready to treat it accordingly. It is a useful diagnostic tool in the right hands, with the right patient, and performed with caution.⁴

four You have correctly diagnosed exercise induced asthma, based upon history and physical examination, in this patient. You could now further verify the exercise based trigger with and exercise based PFT. The next question deals with appropriate treatment. In this case we have a young active 22-year old female and we certainly want to encourage exercise as much as possible. Based upon the most recent asthma guidelines as well as good clinical judgment, initial therapy for this young lady should be targeted at prevention of airway obstruction during exercise. She is an “intermittent” asthmatic who only wheezes with exercise. Of the medication listed in the question, which would function best as an initial therapy prior to exercise? Of those listed, a Beta 2-agonist “rescue inhaler” would serve this purpose. Her symptom frequency and severity at this time at this time do not warrant the use of steroids either by inhalation or systemically. A fluticasone/salmeterol inhaler is an interesting choice, but it is the wrong answer. It consists of salmeterol, a long acting Beta 2-agonist and an inhaled steroid. It would be indicated in this case as a baseline medication if her symptoms occurred more frequently than her once a week softball game. Theophylline is not indicated in this case. Answer E is the best choice. In this instance, the inhalation of a Beta 2-agonist one-half hour prior to exercise may be all that this patient needs and would be a good starting point.⁵

five Cessation of cigarette smoking is an important factor in maintaining health and preventing disease. Here we have a young woman who is currently smoking a half a pack of cigarettes daily, and has done so for the past seven years. Although all the choices listed may have a beneficial effect in helping her to quit smoking, a stepwise process in helping patients quit smoking is always advisable. This is especially true in this age group where students smoke for a variety of reasons including peer pressure. In this instance, a good first step, and thus the correct answer among those listed, is answer E. A clinician can often make an important difference by discussing the health effects of tobacco, and pointing out, in a positive and affirmative manner, the benefits of smoking cessation. This is an important first step in any plan.⁶

SUMMARY



In this case we have demonstrated a case of “exercise induced asthma” in a young college student. Pulmonary function tests were discussed and it is important to understand that in between “attacks” a patient’s spirometry may be normal. The use of a methacholine challenge was discussed as a diagnostic tool, and the role of a Beta 2-agonist prior to a trigger exposure was pointed out. By taking her rescue inhaler prior to exposure to a known trigger, this patient should be able to continue to play softball. Smoking cessation is always important, and the role of the physician in talking to a patient about quitting smoking is always important. Always remember that one of the important roles of a clinician is to educate patients about health promotion.

References:

- ¹ Introduction to Pulmonary Function, Otolaryngologic Clinics of North America - Volume 41, Issue 2, Michael W. Chu, MD, Joseph K. Han, MD (April 2008)
- ² Alpha-1 Antitrypsin Deficiency: Pathogenesis, Clinical Presentation, Diagnosis, and Treatment The American Journal of Medicine - Volume 121, Issue, Thomas Köhnlein, MD Tobias Welte, MD, PhD, (January 2008)
- ³ Adkinson: Middleton's Allergy: Principles and Practice, 7th ed. Chapter 48 – Clinical Significance of Immunoglobulin E, Phillip H. Smith, Dennis R. Ownby
- ⁴ Bronchoprovocation Testing in Asthma. Ronina A. Covar, MD, Immunology and Allergy Clinics of North America - Volume 27, Issue 4 (November 2007)
- ⁵ Rakel: Textbook of Family Medicine, 7th ed, Exercise-Induced Bronchospasm .
- ⁶ The Most Addictive Drug, the Most Deadly Substance: Smoking Cessation Tactics for the Busy Clinician, Rob Crane, MD, Primary Care: Clinics in Office Practice - Volume 34, Issue 1 (March 2007)



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RELEASE & REVIEW DATE

This activity was last reviewed and released on December 1, 2008 and expires December 1, 2009. Credit cannot be awarded after this date.

BACKGROUND

Chronic obstructive pulmonary disease (COPD) is responsible for one death every four minutes in the US. While 12 million Americans have been diagnosed with the disease, it is estimated that at least that many have COPD but are undiagnosed.

Several COPD risk factors converge in East Texas, resulting in some of the highest rates of unnecessary hospitalizations in the state. Since primary care physicians, PAs and NPs in the region are the most likely to diagnose and manage COPD, they should be made aware of the most current information available on how to improve patient outcomes and overcome clinical barriers to diagnostic testing and treatment.

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Dr. Dubin has no conflicts of interest to disclose.

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