PROBLEM-BASED LEARNING:
AN INTERACTIVE CASE DISCUSSION OF
AN ATHELETE w/ EXERCISE INDUCED
DYSPNEA

RAY S. DAVIS, MD
PROFESSOR IN CLINICAL PEDIATRICS
DIVISION OF ALLERGY IMMUNOLOGY & PULMONARY MEDICINE

Washington University in St. Louis
School of Medicine
FINANCIAL DISCLOSURES

- NONE RELEVANT TO TODAY’S TALK
OBJECTIVES

- To discuss the differential diagnoses of a patient with exercise-induced dyspnea.
- To understand the evaluation and management of this patient.
Vicki D. is a 15-year-old Caucasian female competitive soccer player who presents to your office with a history of “difficulty breathing and wheezing” occurring during her games over the last few months. Her primary care physician recently placed her on a combination inhaler (fluticasone 250 mcg/salmeterol 50 mcg Diskus), 1 inhalation twice daily after a trial on albuterol inhaler 2 puffs, 10 minutes prior to her games did not help. Despite this new inhaler, she is still being taken out of games due to her breathing problems.
HISTORY (cont’d)

- She is accompanied by both of her parents, who are very concerned that this problem will affect her potential to be recruited for a college soccer scholarship.

- Social History—“well-adjusted” teenager; A+ student; great athlete.
HISTORY (cont’d)

- Past Medical History, Review of Systems, Family History and Physical Exam are all unremarkable. She’s never had breathing problems before and has no Family history of allergies or asthma.
IMPRESSIONS

1.

2.

3.
DIFFERENTIAL DX of
DYSPNEA w/ EXERCISE

- EIB
- VCD/EILD
- DECONDITIONING
- LARYNGO or TRACHEOMALACIA
- GERD/LPR
- E.I. ANAPHYLAXIS
- RESTRICTIVE LUNG DZ. (OBESITY, INTERSTITIAL)
- CARDIAC ETIOLOGY.
EVALUATION

1.

2.

3.
TEST RESULTS

- **CXR** - Normal

**SPIROMETRY**

<table>
<thead>
<tr>
<th></th>
<th>BASELINE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FVC</strong></td>
<td>100% (of predicted)</td>
<td>+ 2%</td>
</tr>
<tr>
<td><strong>FEV1</strong></td>
<td>98% (of predicted)</td>
<td>+ 2%</td>
</tr>
<tr>
<td><strong>FEV1%</strong></td>
<td>90%</td>
<td>0</td>
</tr>
<tr>
<td><strong>FEF 25-75</strong></td>
<td>85% (of predicted)</td>
<td>+ 1%</td>
</tr>
</tbody>
</table>
FLOW VOLUME LOOP
EXERCISE CHALLENGE TESTING
w/FLOW VOLUME LOOPS…
FOLLOWED BY IMMEDIATE NASOPHARYNGOSCOPY WAS NORMAL.
METHACHOLINE CHALLENGE TESTING WAS ALSO NORMAL.
SO, WHAT DO YOU DO WITH THIS HISTORY, BUT ALL NORMAL TESTS???
CHARACTERISTICS OF E.I.B.

- Occurs in 90% of asthmatics
- Onset of sx usually > 5 min.
- More difficulty on exhaling
- Usually blocked by albuterol pre-TX
- Lung function is usually normal at rest
- If lungfcn. is abnl, may need ICS daily
- FeNO may be helpful
- Gold standard dx:
  Exercise challenge testing ↓ FEV1 ≥ 10%
  (Mannitol testing now in your office)
VOCAL CORD DYSFUNCTION

- A disorder that occurs when the vocal cords paradoxically **adduct** upon inspiration when they should **abduct**.

- Symptoms can include dyspnea, noisy breathing, inspiratory stridor, chest or neck tightness, cough and sometimes a feeling of panic.

- VCD can co-occur in patients diagnosed with asthma.
CHARACTERISTICS OF V.C.D

- Often no Hx of asthma or allergies
- Onset within seconds to minutes
- More diff. “Getting air in than out”
- Not blocked by albuterol pre-Tx
- Stereotype of “Type-A” teen-age girl
- Flow volume loops may be “clipped”
- Lung function is usually normal
- Gold standard Dx: Ex. Challenge w/ nasopharyngoscopy
- May be performance anxiety or a convergence reaction
TRIGGERS OF VCD

- exercise
- stress
- performance anxiety
- allergies
- GERD/reflux
- asthma
- laughing/crying
- fragrances
- extreme temperatures
- wind/brass instruments
INSP/EXP FLOW VOL. LOOPS
GOLD STND DX VCD

- EXPENSIVE TO PERFORM EX. CHALLENGE AND COORDINATE AN ENT/ALLERGIST’S NASOPHARYNGOSCOPY IMMEDIATELY FOLLOWING
- TIME CONSUMING
- PARENTS/PATIENTS MISS WORK/OR SCHOOL
- UNPLEASANT EXPERIENCE
- NOT ALWAYS ABLE TO PROVE VCD
VIDEOTAPING FOR DX VCD

TREATMENT

- MOST EFFECTIVE IS WITH A QUALIFIED SPEECH THERAPIST
- PROPER BREATHING EXERCISES NEED TO BE PRACTICED REGULARLY
- STRATEGIES TO DEAL WITH ANXIETY/PERFORMANCE ANXIETY
- SOMETIMES PSYCHOLOGIST OR PSYCHIATRIST CONSULTATION
ANY QUESTIONS?