Clinical Presentations and Management Differences of COPD and Pulmonary Edema

Cline: ch. 25 ; ch. 37

Brady pp 583; 694

(+/or other standard paramedic text)

Objectives

Upon completion of this lecture you should be able to discuss :

- Discuss the common clinical occurrence of having to distinguish "heart vs lung" in acutely ill patients
- Compare and contrast COPD and Pulmonary Edema in their clinical presentation regarding:
  - History (present illness, medications)
  - Physical findings
  - Management differences

Distinguishing "Heart vs Lung" in Acutely Ill Patients

When faced with a patient in respiratory distress, the emergency clinician is:

- Focused on the initial assessment and intervention
- ***Not*** primarily focused on making a specific diagnosis
- Aware that the initial management of COPD and pulmonary edema have many similarities but also a few significant differences

Distinguishing "Heart vs Lung" in Acutely Ill Patients

Assessment pitfalls:

- All desaturated patients are ***not*** "lungers"
- "All that wheezes is ***not*** asthma"
  [nor COPD with asthma]
- "All that wheezes does ***not*** need Albuterol"
- "It's dangerous to initiate therapy before xray and lab work"
- All cardiac asthma patients are ***not*** hypertensive
- All COPDers are ***not*** dry and non-diaphoretic

Distinguishing "Heart vs Lung" in Acutely Ill Patients

Assessment pitfalls:

- "All that wheezes is *not* asthma"
- Adult wheezing, has many causes; in a "CUPS" assessment, a critical or unstable patient often has wheezing - due to RAD
  - Both COPD and Pulmonary Edema trigger RAD

Treatment pitfall:

- Failing to treat bronchospasm because: "Heart patients (Pul Ed) must not be given Albuterol"

Acutely Ill Patients with CHF

Diagnosis before before therapy ??

- No; the diagnosis is not needed before initial therapy: all critical or unstable medical patients receive: ABCDE / O2 M3 Bld IV Glu
- Both COPD and Pulmonary Edema receive the same initial therapy except high-flow O2

CHF diagnosis (during therapy) is based on:

- clinical criteria

Acutely Ill Patients with CHF

- CHF diagnosis (after therapy has been initiated) is based on clinical criteria [Framingham; others]
  - History and Physical
  - Objective evidence of ventricular failure
  - Response to therapy
- Diagnosis can be difficult :
  - In a hurry
  - Without an xray
  - In patients who also have lung disease (COPD, pneumonia)

Distinguishing "Heart vs Lung" and Treating Acute CHF

New rapid,

- Test for distinguishing "heart vs lung"
  - High BNP levels help distinguish CHF from other causes of acute dyspnea
- At the "point of care" [like an accucheck …?]
- BNP levels :
  - Non-CHF dyspnea (pneumonia, COPD/RAD,…) : 40
  - CHF : 1000 + [1076 +/- 138 pg/ml]

Distinguishing "Heart vs Lung" in Acute Dyspnea

Heart	Lung
causes:	
• Pulmonary Edema (LCHF, decompensated)	• Asthma • COPD • Mimics – FBAO – Anaphylaxis – Pneumonia

Distinguishing "Heart vs Lung" in Acute Dyspnea

Heart	Lung
cc:	
• SOB	• SOB
• +/- chest pain	• Rare chest pain
• Sudden onset	• Sudden onset [chronic dz, which suddenly worsened]

Distinguishing "Heart vs Lung" in Acute Dyspnea

Heart	Lung
Hx:	
• CAD / CHF	• Lung Dz ; smoker
• MI ; CABGS	• recent hospitalization
• Exertion	• Exercise / DOE
• Off diuretic / increased salt	• Environment – air pollution – pollen
• Dialysis patient	

Distinguishing "Heart vs Lung" in Acute Dyspnea

Heart	Lung
Hx: Meds:	
• heart meds – NTG – ACE I – B blocker	• Home O2 • Inhalers – albuterol – atrovent
• lasix, K+	• Prednisone
• ASA	
• Statin	

Heart	Lung
PE	
Across the Room	
• **Upright**	• restless
• Agitated	
Airway:	
• Pink frothy	• " sniff " ; pursed lips
Breathing:	
• +/- wheezing	• +/- wheezing

EMC 360

Heart	Lung
PE	
Circ.:	
• **Pale, cool, clammy**	• Dry; +/- cyanotic
Vitals:	
• **O2 sat**: less than 86%	• O2 sat: ~ 90%
• **BP**: **250/140**	• Normal or slightly elevated
• **HR**: ST or A-fib with RVR	• slightly elevated
• **RR**: increased	• Increased
• **T** **cold / clammy**	• slight fever

EMC 360

Heart	Lung
CHEST:	
• wheezes + **wet rales**	• wheezing or quiet
CV:	
• "S_3 ; S_4 "..if SBP 220+	• distant heart tones (barrel chest)
Treatment	
• High flow O2 NRB	• low flow O2 , unless in respiratory failure

EMC 360

Heart	Lung
Treatment :	
• **NTG** 0.4 - 0.8 mg **SL**	• Albuterol 1.25-5 mg HHN
• **NTG** 2" paste	• Ipratropium 500 mic HHN
• **NTG** IV 10-50 mic/min	• Mg 1-2 gram IV
• Lasix 80-120 mg IV	• Solumedrol 125mg IV
• Morphine 4 mg IV (controversial)	• BiPAP, if O2 Sat still not 90% after NRB
• CPAP/BPAP, if O2 Sat still not 95% after NRB	• ET (as large* as possible):
• Albuterol (as per local protocol). [***Not*** epi.]	– ALOC +/or exhaustion
• ALOC +/or fatigue: ET	– Hypercarbia / acidosis
• BNP 2 MIC / KG IV bolus	– If O2 Sat still below 90% after above therapies

* large ET aids weaning,suctioning, bronchoscopy, ventilating

EMC 360

Distinguishing "Heart vs Lung" and Treating Acute CHF

BNP in CHF :

- New rapid, inexpensive test for CHF diagnosis and prognosis
- Test for distinguishing "heart vs lung"
  - High BNP levels help distinguish CHF from other causes of acute dyspnea
- At the "point of care" [like an accucheck …?]
- BNP levels :
  - Non-CHF dyspnea (pneumonia, COPD/RAD,…) : 40
  - CHF : 1000 + [1076 +/- 138 pg/ml]

EMC 360

BNP in Acute CHF

- High BNP level:
  - marker for LV dysfunction
- When LV is stressed and stretched
  - the myocyte (by activating a gene transcription) responds by producing a small protein [hormone]
- BNP neurohormone effects
  - of renin-angiotensin-aldosterone system (which is also activated by LV dysfunction)

EMC 360

BNP in Acute CHF

- Increased levels of BNP (and levels of other natriuretic peptides, ANP and CNP)
  - Cause diuresis, vasodilitation, and natriuresis
  - Reduce preload
  - Reduce afterload

IV BNP for Treating Acute CHF

IV BNP, nesiritide (Natrecor) :

- MOA:
  - Sodium excretion (natriuresis)
  - Diuresis
  - Vasodilation
- May be indicated for acute decompensated CHF
- Response to treatment can be assessed
- Dose : 2 mic / kg IV bolus; then
  0.01 mic / kg / min IV continuous drip

BNP in Acute CHF

- CHF pathophysiology causes elevated BNP
- BNP blood sampling can accurately detect CHF
- IV BNP can be an effective as treatment for CHF (1)
- IV BNP is as effective as standard treatment (1)
- BNP levels can be used as a :
  - test for response to therapy
  - predictive marker for limitation and for sudden cardiac death in CHF patients (2)

(1) Calucci *NEJM* 2000:334:246-256
(2) Berger, Circulation

Summary

We have discussed :

- Common clinical similarities in the "heart vs lung" acutely ill patient
- Comparative pulmonary edema vs COPD similarities and differences in their presenting: Hx, PE findings, management
- A few treatments that are different, that are relatively contraindicated, or that are even absolutely contraindicated in one or the other.