Objectives

- Will be able to better identify agriculture related lung illness.
- Understand the need or lack of need for treatment in relation to agriculture related lung disease
- Participants will be able to help in patient and provider education of agriculture related lung disease and most importantly prevention strategies.
Why Ag Lung Diseases?
It effects us all from being a care provider to a community member

Ag Lung Diseases
- Hypersensitivity Pneumonitis
- Asthma-like Syndrome
- Asthma/COPD exacerbations
- Organic Dust Toxin Syndrome (OATS)
- Chemical Exposure
Hypersensitivity Pneumonitis

AKA: Extrinsic allergic alveolitis, “Farmer’s Lung”

Etiology: Reaction to bacteria/fungi in spoiled hay or grain. Also poultry/pets.

Symptoms: Fever, chills, cough, malaise, hypoxia, 4-6hrs after exposure

PFT’s: Low FVC and Low DLCO

Hypersensitivity Pneumonitis

Requires prior antigen exposure

Imaging: X-ray=may be normal, High Resolution CT=ground glass

Treatment: Steroid therapy 2-4 wk taper

Prevention: Respirators

High Resolution CT
Hypersensitivity Pneumonitis
- Subacute Farmer’s Lung: longer term/repetitive exposure with mild symptoms
- Chronic Farmer’s Lung: Irreversible pulmonary fibrosis

Asthma-like Syndrome
- Etiology: Exposure to combination of dust, endotoxin, & ammonia. Exposure in confinement barns.
- AKA: Reactive Airways Dysfunction Syndrome (RADS)
- Symptoms: wheezing, cough, dyspnea
- Imaging: X-ray=normal
Asthma-like Syndrome

- Treatment: Albuterol and asthma meds not very effective, steroids are mainstay
- Found to be protective for allergies/asthma as it is not allergy related
- Prevention is best treatment—respirator, limit exposure time, ventilation

Hygiene Hypothesis

- Theory that microbial and endotoxin exposure down regulates immune response in children.
Organic Dust Toxic Syndrome

- Etiology: Endotoxin or fungal spores attached to dust. Grain bins, silo unloaders lung, hog confinement, 36% of farmers experience
- Symptoms: Flu-like, fever, malaise, cough, myalgias, headache, developing 4-8hrs after exposure, NO hypoxia

Imaging: X-ray=normal
Labs: Elevated WBC's
Treatment: Self-limited, no antibiotics
Prevention: Respirators, wet down silage before breaking to settle dust
**Chemical Exposures**

- **Anhydrous Ammonia**: Mucous membrane irritant resulting in pulmonary edema
  - Treatment: Intubation and water

**Chemical Exposures**

- **Pesticides (organophosphates)**
  - Symptoms: Bradycardia, wheezing, salivation, respiratory paralysis, odor, pulmonary edema
  - Treatment: Atrovent, Atropine until bronchial secretions clear, 2-PAM
  - Avoid succinylcholine for RSI

**Chemical Exposures**

- Welding-fumes. Aluminum releases NO, TIG welding releases small amounts of tungsten
- Herbicides: Uncertain direct effect, indirect increases leukemia/lymphoma—be aware to this as CXR may look like lymphadenopathy in non-smokers
Silo Filler’s Disease

- Etiology: fermenting silage produces nitrogen dioxide that induces pulmonary edema
- Symptoms: Cough, burning, fever, nausea/vomiting
- Timeline: Hours to 3 wks after filling. Can relapse in 2-6 wks after original episode

- Treatment: oxygen, mechanical ventilation, high dose steroids
- Prevention: Avoid exposure

Asthma/COPD Exacerbations

- Asthma:
  - Symptoms: wheezing, cough, if related to exposures may only occur at work
  - Treatment: inhaled beta agonists, steroids
  - Prevention: avoid exposures (once asthma developed)
### Asthma/COPD Exacerbations

- **COPD**
  - Symptoms: cough, hypoxia, mucous secretions, dyspnea
  - Treatment: inhaled beta agonists, inhaled anticholinergics, inhaled/oral steroids, PD4 inhibitor
  - Prevention: Exposure reduction

### Zoonotic Infections

- **Tuberculosis** - Bovine derived
  - Q fever: exposure to cattle/sheep/goats. Treat with tetracycline
  - Chlamydia pneumonia - exposure to chickens/turkeys/parrots/parakeets. Treat with tetracyclines
  - Hantavirus - transmitted from mice
  - Swine influenza

### Other...

- Distiller’s Grain: fermented grains used for feed mixture-new to feed market
- Diesel Exhaust- irritant effect that exacerbates asthma/COPD, carcinogen exposure, uncertain effect of new exhaust reduction efforts i.e. DEF, Regen
Other...

- Byssinosis “Brown Lung”: Cotton fiber inhalation causing asthma-like symptoms. Treat with asthma medications and limit exposure.
- Breath through your nose-particles >20microns-100% filtered, 5 microns only 50% filtered.

Prevention

Respirators
Respirator

- DISPOSABLE DOUBLE STRAP
- Uses: Most any agriculture use but caution with anhydrous ammonia, $1
- Limitations: No face protection, hot, requires negative pressure breathing and significant effort

Respirator

- REUSABLE CARTRIDGE MASK
- Uses: Most any agriculture application, better fit and seal, different cartridges for different exposures, $30-50
- Limitations: No face protection, hot, requires negative pressure breathing but easier than disposables typically

Respirator

- SELF CONTAINED BREATHING APPARATUS
- Uses: Any agriculture environment, face protection, cool air, easy breathing
- Limitations: Cost, bulk as you have to wear the pump, $1000-1500
References

- What Farming Can Do to Your Lungs: How it can make you sick & how it can protect. Von Essen, S. www.unmc.edu/publichealth. 2011

References

- University of Wisconsin Agricultural Safety & Health Website. Silo Gas and Silo Filler’s Disease. 7/27/12