Anthrax

Epidemiology

Source / Transmission
• Spores in soil, persist from years, no aerosolization, not a source for humans
• Sick animals: direct contact with lesions, meat consumption, spores on skin
• Weaponized spores: 10^9 to 10^12 spores/g, inhalation
• Humans are NOT infectious, internal mediastinum infection, no expelling bacilli, no secondary cases
• Laboratory exposure

Bacillus anthracis
• Aerobic, gram-positive, spore-forming,
• Nonmotile, non-hemolytic
• Large vegetative cell: 1-8 µm/1-1.5 µm, poor survival outside animal or human

Incubation
- 1-7 days (max 60 days)

Inhalation Phase I
• Fever, chills, headache, cough, dyspnea, chest pain, vomiting, abdominal pain
• Duration: few days, CXRay: No pneumonia

Inhalation Phase II
• Onset abrupt, fever, dyspnea, diaphoresis, shock
• Massive lymphadenopathy
• Hemorrhagic mediastinitis
• Hemorrhagic meningitis 50%
• Fulminant, death before dx
• Mortality: 90% no tx

Wide mediastinum in previously healthy with overwhelming ILI = anthrax

SKIN ANTHRAX
Through skin cut or abrasion on exposed skin area
Spore germinate in skin ⇒ toxin
• Local edema
• Macule ⇒ vesicle ⇒ pustule ⇒ black eschar ⇒ falls off, no scar
• Lymphangitis + painful lymphadenitis
• Some systemic symptoms
• Antibiotic does not influence local lesion BUT prevents systemic sx
• Mortality 0% with antibiotics, 20% without

Gastro-intestinal Anthrax
Ingestion of spores
• Oral/pharyngeal ulcer ⇒ edema, lymphadenopathy, sepsis
• Lesions in terminal ileum and cecum:
  • Nausea, vomiting
  • Acute abdomen
  • Sepsis, massive ascites
• Mortality high

Differential bacteriology
• If not suspected peripheral lab will identify "Bacillus" and go no further
• Most “bacillus” = contamination or B. cereus
• Confirmation in specialized lab
• Sputum culture not useful: no pneumonia

Diagnosis
• Gram stain of unspun blood, CSF: G+ boxcar
• Standard blood culture: 6-24 hrs confirmation in 12 hrs:
  1-Colonial morphology
  2-Hemolysis and motility: NON motile, NON hemolytic
• Rapid identification by ELISA for protective antigen
• PCR

Treatment, Prophylaxis

Oral Rx
Adult
• Cipro 500mg po q12h
• Amoxicillin 500mg po q8hr

Child >20kg
• Cipro 10-15mg/kg
• Amoxicillin 500mg po q8hr

Child <20kg
• Cipro 10-15mg/kg
• Amoxicillin 15mg/kg po q12h

Pregnant
• Cipro 500mg po q12h
• Amoxicillin 500mg po q8hr

Immunosuppressed
• Same as other adult

Optimal if suscep
• Duration
  • Early antibiotics are essential
  • Most natural strains sensitive to penicillin, doxycycline
  • Some weaponized strains engineered to resist penicillin and doxycycline

Control

Anyone with direct physical contact with anthrax should
• Wash exposed skin
• Remove then wash clothing with soap & water
• Further decontamination of directly exposed individuals not indicated
• Equipment /surfaces decontaminated with 5% hypochlorite (bleach) 30 mn / Steriplex®
• Receive postexposure antibiotic prophylaxis until the substance is proved not to be anthrax

HUMAN VACCINE
US anthrax vaccine = inactivated cell-free product, filtrate of a nonencapsulated attenuated strain
principal antigen = protective antigen
licensed in 1970, Bioport Corp., Lansing, MI
6-dose series
all US military active- and reserve-duty personnel
1 small placebo-controlled human trial: efficacious against cutaneous anthrax
Population-wide vaccination not recommended
Postexposure vaccination following a biological attack with anthrax recommended with antibiotic administration to protect against residual retained spores, if vaccine were available

http://www.infectiousdisease.dhh.louisiana.gov
(800)256-2748