Nocardia Infections in Arizona

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Background - Epidemiology

• Infectious agent:
  – Gram-positive bacilli
  – *Nocardia* spp

• Occurrence: sporadic in people and animals worldwide; found in soil

• Incidence: 500-1,000 new cases of *Nocardia* infection occur annually in US
Background - Epidemiology

• Transmission: Inhalation or skin inoculation
• Incubation period: Uncertain; probably a few days to a few weeks
• Communicability: Not directly transmitted from humans or animals
• Risk factors: Immunocompromised (ie alcohol, diabetes, steroid use, malignancy)
Background – Clinical features

• 80% of nocardiosis cases present as invasive pulmonary infection, disseminated infection, or brain abscess; 20% present as cellulitis

• Complications
  – Pleural effusion
  – Empyema
  – Pericarditis
  – Mediastinitis
  – Brain Abscess
  – Disseminated disease
Background - Diagnosis

• Frequently misdiagnosed as tuberculosis
  – upper lobe involvement
  – weakly acid-fast stain

• Slow growth on culture (5-21 days)
Reported Nocardiosis Cases by Age, 2007-2008
Reported Nocardiosis Cases by County, 2007-2008

Number of reported cases

Maricopa: 100
Navajo: 2
Pima: 10
Pinal: 1
Yuma: 5

County
Nocardia Study - Methods

• August 2007 – January 2009
• Isolates submitted to CDC for species confirmation and susceptibility analyses
• Medical records reviewed
  – Risk factors
  – Diagnosis
  – Treatment
  – Outcomes
Nocardia Study – Preliminary Results
Nocardia Study – Risk Factors

- 55 medical records reviewed
- 45 (73%) were 60 y.o. or older
- 29 (53%) were current smokers or had a history of smoking
- 40 (73%) had underlying pulmonary problems
  - 19 (35%) had COPD
  - 15 (27%) had a concurrent lung infection
  - 5 (9%) had asthma
Nocardia Study – Risk Factors

- 30 (55%) were immunocompromised or had a history of being immunocompromised
  - 14 (25%) had cancer (ie lung, breast, esophageal); 7 (13%) had history of cancer
  - 7 (13%) had diabetes mellitus
Nocardia Study - Diagnosis

• 22 (40%) were not diagnosed with nocardiosis by a physician
• 31 (56%) were diagnosed with nocardiosis by a physician
  – Length of time from sx onset to date of diagnosis by a physician
    • Mean: 67 days
Nocardia Study - Treatment

- 29 (54%) were treated with appropriate antibiotics for *Nocardia* infection
  - Mean: 164 days (5.5 months)

- Types of Antibiotics
  - Trimethoprim/sulfamethoxazole (Bactrim): 23 (79%)
  - Imipenem: 4 (14%)
  - Minocycline: 3 (10%)
  - Linezolid (Zyvox): 3 (10%)
  - Amikacin: 2 (7%)
  - Ciprofloxacin: 1 (3%)
  - Ceftriaxone (Rocephin): 1 (3%)
Nocardia Study – Susceptibility Results

Percentage of Isolates with Resistance

Antibiotic

Leadership for a Healthy Arizona

Arizona Department of Health Services
Nocardia Study - Outcomes

• 28 (51%) were hospitalized
  – Mean: 8 days
• 20 (36%) recovered
  – Mean: 6.5 months (197 days)
• 12 (22%) died
Nocardia Study - Limitations

- *Nocardia* infection is not reportable. Analyses done only on isolates received at state lab.
- Medical records lacked complete information or information regarding nocardiosis.
Nocardia Study - Conclusions

• Common factors in patients with nocardiosis include being immunocompromised or have underlying pulmonary problems and being of older age
• Nocardiosis is often misdiagnosed or undiagnosed
• Nocardiosis should be considered in any patient who presents with brain, soft tissue, or cutaneous lesions, and a concurrent or recent pulmonary process
Take Home Points

- Education of providers in the diagnosis and treatment of *Nocardia* infections
- Improvement in the exchange of test results between submitting hospital and provider
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Questions?

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