A Multistate Outbreak of Fungal Meningitis and Other Infections Associated with Contaminated Steroid Injections

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Healthcare Infection Control Practices Advisory Committee
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The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Major Outbreak Response

- Largest healthcare-associated infection outbreak reported in the United States

- Massive undertaking
  - Response was a joint effort at CDC
    - Division of Healthcare Quality Promotion
    - Mycotic Diseases Branch
  - Over 300 staff at CDC HQ
  - Likely more than 1000 staff nationally
    - State and local health departments
    - Clinicians, nurses, administrative staff

- Collaborations
  - State HDs, FDA, CMS, clinicians
Development of Clinical Guidance

- Engaged clinical expert mycologists with experience in fungal infections
  - Best practices for diagnosis, treatment, and management
  - Based on little to no data, but likely theoretical benefit
- Resulted in real-time development, dissemination of recommendations for patient care
  - Able to evolve with the rapidly changing outbreak
- CMS
  - CDC guidance used as the basis for modifying indications for diagnostic testing and treatment and eligibility for reimbursement
CDC Health Alert Network (HAN):

Update: Notice to Clinicians: Continued Vigilance Urged for Fungal Infections Among Patients Who Received Contaminated Steroid Injections, March 4, 2013
Update: Multistate Outbreak of Fungal Infections among Persons Who Received Injections with Contaminated Medication, December 20, 2012
Update: Additional Contamination Identified in Medical Products from New England Compounding Center, December 3, 2012
Update: Multistate Outbreak of Fungal Meningitis and Other Infections Associated with Contaminated Steroid Medication, November 20, 2012
Contamination Identified in Additional Medical Products from New England Compounding Center, November 1, 2012
Voluntary Recall of All Ameridose Medical Products, November 1, 2012
Issuance of Guidance on Management of Asymptomatic Patients Who Received Epidural or Paraspinal Injections with Contaminated Steroid Products, October 23, 2012
Update: Multistate Outbreak of Fungal Meningitis and Joint Infections Associated with Contaminated Steroid Medications, October 17, 2012
Multistate Outbreak of Meningitis and Stroke Associated with Potentially Contaminated Steroid Medication, October 8, 2012
Meningitis and Stroke Associated with Potentially Contaminated Product, October 4, 2012
Laboratory Support

- Fungal diagnostics for CSF do not exist
- Novel PCR test developed in 2 days
- >1,000 specimens processed during outbreak

- Detection of fungal DNA in human body fluids and tissues during a multistate outbreak of fungal meningitis and other infections
  - L Gade, et al., Eukaryotic Cell, 1 March 2013
Communications

- **Integral component of outbreak response**
  - Website
  - Media
  - Publications
  - HANs
  - Blast emails

- **Widely lauded as “best practices”**
Case Definitions

- **Probable Case:** Person who received injection with one of the 3 implicated lots of MPA from NECC and developed any of the following:
  - Meningitis of unknown etiology following epidural or paraspinal injection
  - Posterior circulation stroke without cardioembolic source or documentation of a normal CSF profile following epidural or paraspinal injection
  - Osteomyelitis, abscess or other infection of unknown etiology, at or near the site of injection following epidural or paraspinal injection
  - Osteomyelitis or worsening inflammatory arthritis of a peripheral joint of unknown etiology diagnosed following joint injection

- **Confirmed Case:** Probable case with evidence (by culture, histopathology, or molecular assay) of a fungal pathogen associated with the clinical syndrome

http://www.cdc.gov/hai/outbreaks/clinicians/casedef_multistate_outbreak.html
# Case Count as of March 11, 2013

<table>
<thead>
<tr>
<th>State</th>
<th>Total Case Count</th>
<th>Meningitis Only</th>
<th>Meningitis + Paraspinal/Spinal Infection</th>
<th>Stroke w/out Lumbar Puncture Only</th>
<th>Paraspinal/Spinal Infection only</th>
<th>Peripheral Joint Infection Only</th>
<th>Paraspinal/Spinal Infection + Peripheral Joint Infection</th>
<th>Deaths</th>
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<tbody>
<tr>
<td>Florida (FL)</td>
<td>25</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>722</strong></td>
<td><strong>239</strong></td>
<td><strong>138</strong></td>
<td><strong>7</strong></td>
<td><strong>304</strong></td>
<td><strong>32</strong></td>
<td><strong>2</strong></td>
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</tbody>
</table>
Epidemic Curve as of March 4, 2013

Week of Diagnosis of Case-Patients
(665 Case-Patients, 788 Dates of Diagnosis)

- Joint Infection
- Meningitis
- Spinal/Paraspinal Infection
- Stroke without LP

Week of Diagnosis

Total Cases
### Characteristics of Case-Patients (n=684)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Median Age</td>
<td>64 years (16-97 years)</td>
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<tr>
<td>Sex, Female</td>
<td>411 (60%)</td>
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<tr>
<td>State of Injection</td>
<td></td>
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<tr>
<td>MI</td>
<td>238 (35%)</td>
</tr>
<tr>
<td>TN</td>
<td>146 (21%)</td>
</tr>
<tr>
<td>IN</td>
<td>80 (12%)</td>
</tr>
<tr>
<td>Median Number of Injections</td>
<td>1 injection (1-6 injections)</td>
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<tr>
<td>Laboratory Confirmed</td>
<td>190 (28%)</td>
</tr>
</tbody>
</table>
PUBLIC HEALTH IMPACT
Meningitis Cases Weekly 60-day CFR During the Outbreak
THE FUTURE
The Outbreak Going Forward

- Cases continue to be reported (~5 / week)
- Long term follow up study planned to track clinical course of case-patients
- Possibility of case control study to address some unanswered questions:
  - What are risk factors for infection among exposed?
  - Why do some states/clinics have high attack rates?
    - Injection practice
    - Vial life
THANK YOU