LISTERIA
What is it, why do we care, and what do we do about it?

Nicole Lee (Communicable Disease Branch)
Paula Whitley (Gaston County)
2014 Communicable Disease Conference
Presentation Outline

• What is it?

• Why do we care?
  • Perspectives
    • National
    • State
    • Local

• What do we do about it?
Listeria: What is it?

• *Listeria monocytogenes*

• Primarily foodborne

• High risk groups
  • Elderly
  • Immunocompromised
  • Pregnancy
Listeria: What is it?

- Clinical Picture
  - Includes spontaneous abortions, stillbirths

- Long incubation
  - 3-70 (~2 weeks)

- Duration
Why do we care?

- CDC estimates:
  - 1600 ill/yr
  - 260 deaths/yr
  - > 1,400 hospitalized/yr

- Low incidence / high mortality

- Most often foodborne

CDC estimates:

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  - 1600 ill/yr
  - 260 deaths/yr
  - > 1,400 hospitalized/yr

http://www.cdc.gov/vitalsigns/listeria/infographic.html
Why do we care?

- Roos Foods (2014)
- Crave Brothers (2013)
- Cantaloupes (2011)

Complete outbreak reports can be found at CDC’s website: http://www.cdc.gov/outbreaks/
Cantaloupes (2011)

- 147 ill from 27 states
  - Onsets: July 31 – Oct 21
  - 132/134 (99%) hospitalized
  - 33 deaths
  - One miscarriage

- Laboratory & epi evidence

- Recall: Sept 14 – Oct 6

- Outbreak over: Oct 2011
Crave Brothers (2013)

- 6 ill from 5 states
  - Onsets: May 20 – July 7
  - All hospitalized
  - One died
  - One miscarriage

- Laboratory & epi evidence

- Production stopped: July 1, 2013

- Recall: July 3, 2013 (Crave)
  
  July 5, 2013 (Whole Foods)

- Outbreak over: Sept 24, 2013
Roos Foods (2014)

- 8 ill from 2 states
  - Onsets: Oct 1 – Nov 29
  - 7 / 8 (88%) hospitalized
  - One died
  - 5 related to pregnancy

- Laboratory (whole genome sequencing) & epi evidence

- Recall: Feb 23, 2013

- Food facility registration suspended: March 11, 2014

- Outbreak over: April 18, 2014
PERSPECTIVES

National
State
Local
National Perspective

• Listeria Initiative
  • Piloted in 2004 and implemented nationwide in 2005
  • Lab + Epi components
  • Epi – database of ~2,000 cases

• Grant performance metric (reported annually)
  • Time from case identification to completion of Listeria Initiative form

  • % of lab-confirmed cases with a completed listeria initiative form submitted to CDC
National: Listeria Initiative (Epi)

- Complete for all cases
- Content
  - Lab results
- Severity of illness
- Mother/infant outcomes
- Food exposures
  - Likelihood of consumption
  - Frequency of consumption
  - Purchase location
  - Brand
National: Listeria Initiative (Lab)

- Forward all samples to State Lab
- Pulsed-field gel electrophoresis (PFGE)
- Isolates will be forwarded to CDC
- Whole genome sequencing (WGS)
National: Analysis

- Lab
  - Comparison of PFGE patterns (Yes/No)
  - Analysis of whole genome sequence (alike vs not-alike)

- Epi
  - Most cases of listeria are sporadic
  - Case-case analysis
    - LI forms for sporadic vs LI forms for clusters
    - Behaviors of sporadic cases vs behaviors of outbreak cases
State Perspective

- Performance Metric
  - % of lab-confirmed cases with a complete LI form
  - Time from identification to completed LI form

- Timely response
Local Perspective

- Gaston County
Background

- Notification
  - Local hospitals reported to CD nurse via paper lab.
Background

- Beginning of Outbreak
  - First case reported on 09/22/2013.
    - Male in Cherryville, NC.
  
  - Second case reported 11/18/2013.
    - Female in Gastonia, NC.
  
  - Third case reported on 12/16/2013.
    - Female in Gastonia, NC.
Methods

• Steps Taken to Respond to Outbreak
  • CD Nurse requested records from respective local hospitals.
  
  • CD Nurse made various telephone attempts to contact patients.
  
  • CD nurse sought guidance from the Communicable Disease State Consultant.
  
  • CD nurse completed investigation disease report as contact was made with each patient.
  
  • CD nurse completed additional follow up as requested by the State/CDC.
Results (Epi)

Demographics

- Age (years)
  - < 60: 1 / 3
  - >= 60: 2 / 3

- Gender
  - Male: 1 / 3
  - Female: 2 / 3

- Onset Range
  - July – December 2013

- Hospitalizations
  - 3 / 3
  - Days hospitalized: 3 – 14 (median: 11)

- Deaths
  - 0 / 3

Epidemiology

- Common exposures
Cluster 1 (1312MLGX6-1): Discriminatory Power

- Duplicate isolates: 2013L-5543, 2013L-5598

- Median: 9.5 SNPs
- Median: 33 SNPs
- Median: 79.5 SNPs

No. of cases

Date of isolation, 2013

- Isolated from kale
Lessons Learned

• Seek guidance from state CD consultant.

• Start investigation as soon as possible.

• Be prepared to complete further investigation as requested by the State/CDC.
WHAT DO WE DO ABOUT IT?
Listeria Cases: What do we do about it?

1) Meets Case Definition?

2) Send Specimen to State Lab

3) Complete LI Form

4) Fax to CDB OR attach scanned version to NCEDSS event

Assign to state as “Does not meet” in NCEDSS if NO
In Summary

Listeria Initiative Form

<table>
<thead>
<tr>
<th>LISTERIA CASE FORM</th>
<th>Completed by</th>
<th>Date completed</th>
</tr>
</thead>
</table>

**BOX 1: CASE-PATIENT INFORMATION**
- Case patients: adults and children >1 month of age. For fetal or neonatal infections, the MOTHER is the case-patient.
- Patient's name:
- Surrogate's name:
- Patient's street address:
- City:
- State:
- Zip:
- Phone numbers (h): (w):
- Hospital name(s):
- Hospital contact name(s):
- Sex: M ☐ F ☐
- Ethnicity (check one):
- Race (check one):
- Age:
- DOB:
- State or local ep id:
- CDC outbreak (EPID) ID:

**BOX 2: IS LISTERIA CASE ASSOCIATED WITH PREGNANCY?** (illness in pregnant women, fetuses, or neonates ≥1 month)
- Yes
- If yes, skip to Box 4
- No
- If no, continue with Box 3

**BOX 3: CASES NOT ASSOCIATED WITH PREGNANCY** (illness in non-pregnant adults and children >1 month of age)
- Type(s) of specimen(s) that grew Listeria (check all that apply):

<table>
<thead>
<tr>
<th>Type of specimen</th>
<th>Specimen collection date</th>
<th>Submitting Lab state</th>
<th>State Pub Health Lab isolate ID Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Type of illness (check all that apply)
- Inpatient hospitalized for illness?

<table>
<thead>
<tr>
<th>Inpatient hospitalized for illness?</th>
<th>Patient's outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, if yes</td>
<td>Survived</td>
</tr>
<tr>
<td>No</td>
<td>Died</td>
</tr>
<tr>
<td>Other, if yes</td>
<td>Unknown</td>
</tr>
<tr>
<td>Unknown</td>
<td>Died</td>
</tr>
<tr>
<td>Unknown</td>
<td>Other</td>
</tr>
</tbody>
</table>

Be sure to have the specimen forwarded to the State Lab!

ASM MicrobeLibrary.org © Gini
Local Feedback

Listeria Cases

- Have you had any listeria cases?
- Was a Listeria Initiative form completed?
- Was a sample sent to the state lab?

Suggestions for improving this process?
Thank you!

Acknowledgements

CD Nurses

Local laboratory staff

State laboratory staff

Any additional questions?
References

- www.foodsafety.gov
- www.cdc.gov