Pneumonia

Jeff Katz, MD
ZoomCare Medical Director

OSPA 2012

The problem

Pneumonia is dangerous
Tens of thousands of deaths per year

What is the most common cause of CAP?

40% strep pneumoniae
30% atypicals
30% viruses
What is the most common cause of lobar pneumonia?

Strep Pneumoniae

Who cares?
Pneumonia
Otitis Media
Sinusitis
Meningitis
Sepsis

10%

What’s the most commonly used abx for CAP?
Z-pak

What’s the problem with that?

Increasing resistance
<table>
<thead>
<tr>
<th>Organism: Staphylococcus aureus</th>
<th>Date</th>
<th>Strain</th>
<th>Clinical</th>
<th>Susceptible</th>
<th>Resistant</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant</td>
<td>12/29/2012</td>
<td>2345</td>
<td>Yes</td>
<td>85</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Methicillin-susceptible</td>
<td>12/14/2012</td>
<td>3456</td>
<td>No</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organism: Staphylococcus epidermidis</th>
<th>Date</th>
<th>Strain</th>
<th>Clinical</th>
<th>Susceptible</th>
<th>Resistant</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant</td>
<td>12/29/2012</td>
<td>2345</td>
<td>Yes</td>
<td>85</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Methicillin-susceptible</td>
<td>12/14/2012</td>
<td>3456</td>
<td>No</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organism: Streptococcus pneumoniae</th>
<th>Date</th>
<th>Strain</th>
<th>Clinical</th>
<th>Susceptible</th>
<th>Resistant</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant</td>
<td>12/29/2012</td>
<td>2345</td>
<td>Yes</td>
<td>85</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Methicillin-susceptible</td>
<td>12/14/2012</td>
<td>3456</td>
<td>No</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organism: Methicillin-resistant</th>
<th>Date</th>
<th>Strain</th>
<th>Clinical</th>
<th>Susceptible</th>
<th>Resistant</th>
<th>Intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant</td>
<td>12/29/2012</td>
<td>2345</td>
<td>Yes</td>
<td>85</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Methicillin-susceptible</td>
<td>12/14/2012</td>
<td>3456</td>
<td>No</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

**2019 Gram-positive Cumulative Antimicrobial Susceptibility Report**
Strep Pneumoniae = 56% sensitive to Macrolides
IDSA guidelines
> 5 years old
Data > 12 years old

Z-Pak is decreasingly effective for the most dangerous type of infection

What is the definition of lobar pneumonia?
No routine sputum cultures
What is walking pneumonia?

Atypical "Walking" Pneumonia
Productive cough plateaus and persists long after fever resolves

Time in weeks:
What are the bacterial causes of "walking" or atypical pneumonia?

- Mycoplasma Pneumoniae
- Chlamydia Pneumoniae
- Psittacosis
- Legionella Pneumophila

Which are 3 categories of medicines that work for atypical pneumonia?
Macrolides
Respiratory FQs
Tetracyclines (Doxy)

What age group usually doesn’t get walking pneumonia?

Below the age of 5
How do you distinguish between lobar vs. atypical pneumonia on exam?

What are the clues to mycoplasma?

- fever for at least 3 days
- productive cough -- not improving
- no nasal symptoms
- posterior HA
- mild sore throat
Wheeze or rales or rhonchi  
hypoxia  
tachycardia  
tachypnea

How do you treat community acquired pneumonia?

The goal is to cover Strep Pneumoniae and Mycoplasma  
Only a few antibiotics do both
Stats

Strep Pneumoniae resistance to Macrolides: 19 - 44%
Strep Pneumoniae resistance to Doxy: 10-28%
Strep Pneumoniae resistance to Levaquin, Avelox: 1 - 6%
Strep Pneumoniae resistance to Augmentin: 6%

Using Z-pak for empiric treatment of pneumonia

Clarithromycin?
There are two levels of **empiric** treatment for pneumonia

**Level 1:**

Cheap
Works for atypical or lobar

Which antibiotic?

Doxy
Level 2:

Really sick
co-morbidities
Unclear or confirmed lobar
2nd line for tx failure

respiratory FQ

Which are the respiratory fluoroquinolones?
What percent of pneumonias are missed based on the physical exam alone?

20 - 40%

When should I get a chest x-ray?
Often

What is the definition of bronchitis?

Acute bronchitis is a cold virus in the lung
Acute bronchitis ≠ Walking pneumonia

Mind = Blown
Does viral bronchitis show up with a fever?

almost never

What is the significance of rhonchi?
Rhonchi are nonspecific

Identify the patterns in these cases:

Case 1:
Patient comes in with fever of 101, productive cough, wheeze, no h/o asthma
What is it and how do you treat it?
Case 2:

Patient comes in with fever of 101, productive cough, unilateral rales

What is it and how do you treat

Case 3:

A patient comes in with sudden onset body aches, fever to 102, and a dry cough

What questions do you ask?

Case 3:

A patient comes in with sudden onset body aches, fever to 102, and a dry cough

What do you examine?
Case 3:

A patient comes in with sudden onset body aches, fever to 102, and a dry cough

What do you do now?

Take Home Points:

1. Stop using Z-pak for empiric tx
2. Instead use Doxy or Levaquin
3. If there’s a unilateral component, cover for Strep Pneumoniae
4. A fever + cough requires: pos. flu test, chest x-ray, or abx

References

Musher D. Resistance of Streptococcus pneumoniae to the macrolides, azalides, lincosamines, and ketolides. UpToDate, written 2007, last reviewed 2012.
Legacy Health System Microbiology Department: Antibiogram Data 2008, 2011
Virginia Mason Medical Center Microbiology Department: Antibiogram Data, 2010
FPNotebook.com article on Bacterial Pneumonia and Atypical Pneumonia, 2012