Thinking CAP:
A Q&A Review

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What is the importance of CAP?

According to statistics from Health Canada, community acquired pneumonia (CAP) is the leading cause of infectious diseases in Canada. The very young and the elderly are the most vulnerable groups and for those ill enough to be hospitalized for CAP, mortality is still between five per cent and 10%. For those who recover, most have significant morbidity for weeks after completion of therapy.

How do you make a diagnosis of CAP?

Some of the main things to look for are:

1) new onset or change in respiratory status, such as cough, sputum, chest pain, worsening of dyspnea,
2) constitutional symptoms such as fever, sweating, lost of appetite, malaise or fatigue and
3) new physical findings such as fever, increased respiratory rate and chest examination findings such as "crackling" bronchial sounds.

Most patients only have some of the above features. Very young and older patients may also present with:

- a failure to thrive,
- diminished interaction,
- change in mental status,
- loss of appetite
- and respiratory difficulties.

Roger's case

- Roger, 50, presents with a two-day history of cough, low grade fever, dyspnea and malaise.
- Positive findings on examination include:
  - a temperature of 37.8 C,
  - a respiratory rate of 20 breaths per minute
  - some crackles in the right base on chest auscultation.

Question: If you suspect community-acquired pneumonia, what investigations would you order on Roger?

Answer: 1) Chest X-ray to confirm infiltration.

2) Sputum cultures, only if the patient fails initial empiric therapy, or because there is suspicion of resistant pathogens due to frequent or recent antibiotics usage.

Question: What empiric antibiotics choices are appropriate for Roger?

Answer: 1) A macrolide like clarithromycin or azithromycin is usually the first-line treatment.

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2) If Roger has had a macrolide within the last three months, then you should switch drug class to avoid macrolide resistance. The alternates include doxycycline, telithromycin and respiratory quinolones.

Question: If Roger were 70-years-old, with a 50 pack per year smoking history, ischemic heart disease and diabetes mellitus as co-morbidities, what antibiotics choices are appropriate?

Answer: 1) Respiratory quinolones are the first-line agents, as this class covers the relevant spectrum of pathogens well without secondary medications.

2) If Roger has had a quinolone within three months, or is allergic to quinolones, then a combination of a macrolide/telithromycin, plus a beta-lactam (amoxicillin, amoxicillin/clavulonic acid, cefuroxime, ceprozil) is a better option.

Question: How long should Roger be treated?

Answer: The right course of therapy has not been well studied. In practice, we treat for 10 days, but the range is five to 14 days. In mild to moderate cases, a high dose of levofloxacin, 750 mg per day for five days, has been shown to be effective. There is clinical trial evidence that using telithromycin, 800 mg per day for five days, is effective in mild cases. In general, treatment duration of older, medically complicated or immunosuppressed patients should be longer.

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Q&A *How important is CXR in the diagnosis of CAP?*

A chest X-ray (CXR) confirms infiltration and is more likely to show abnormalities, even in a relatively normal chest examination. If a CXR is not readily available, or the verbal report is not available, its better to treat an ill-looking patient immediately, assuming the worst-case case clinical scenario.

Q&A *Why are current sputum tests not helpful in guiding therapy choices?*

Not all pathogens can be detected by cultures and it usually take at least 48 hours before sputum test results are available. Also, most sputum specimens are heavily contaminated by oral bacteria when processed. All CAP guidelines recommend early initiation of antibiotics when a diagnosis of CAP is made without waiting for the sputum results.

Q&A *What antibacterial coverage is needed for CAP?*

Antibacterial coverage for CAP should include:

1) Core respiratory pathogens like *Strepococcus pneumonia*, mycoplasma and chlamydia.
2) If the patient has a significant smoking history or has chronic obstructive pulmonary disease (COPD), it should also cover hemophilus and moraxella.
3) For patients with significant medical co-morbidities, or long-term care facility patients, coverage should also include klebsiella, proteus, *Escherichia coli* and legionella.

Why do we take an antibiotics history?

This is recommended in several empiric treatment guidelines for CAP, acute sinusitis and acute exacerbation of COPD. The main reason for an antibiotic history is that available epidemiological evidence suggests that recent exposure to a class of antibiotics (*i.e.*, within the preceeding three months) is a simple, but strong, predictor for possible infection by bacteria resistant to the same class of antibiotics.

The antibiotics history should include systemic (either oral or injectable) antibiotics for all causes and not just respiratory tract infections, as more and more antibiotics like the quinolones are being used for non-respiratory tract infections—urinary tract infections, skin and soft tissue infections, gastrointestinal infections, *etc.*

Take-home message

- CAP is still an important and serious infection in Canada.
- In most cases, diagnose and treat empirically, because bacteriology is too slow and unreliable.
- Take an antibiotics history and avoid the same class of antibiotic that has been used within the previous three months.

Why differentiate the quinolones into respiratory and non-respiratory?

Respiratory quinolones include:

- levofloxacin,
- moxifloxacin,
- gatifloxacin and
- gemifloxacin.

Non-respiratory quinolones are:

- ciprofloxacin,
- ofloxacin and
- norfloxacin.

The main distinction is the penetration of drug into the respiratory tissues (*i.e.*, lungs, bronchial mucosa and sinuses.) Respiratory quinolones achieve high levels in the respiratory tissues and thus are suitable for infections in those areas. Dx

References

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