Getting the Basics Right

Managing dilemmas in respiratory tract infections and antibiotics prescribing

Fran Robinson talks to Dr Kevin Gruffydd-Jones, PCRS-UK policy advisor and author of the PCRS-UK opinion sheet on cough

Respiratory tract infections (RTIs) are the commonest acute problem dealt with in primary care. Most will be self limiting and in this case the risk of complications is likely to be small.

However the dilemma for the clinician is being able to spot whether an apparently minor RTI may be something more complicated. Careful decisions also have to be made about when to prescribe antibiotics.

What is a self-limiting infection?

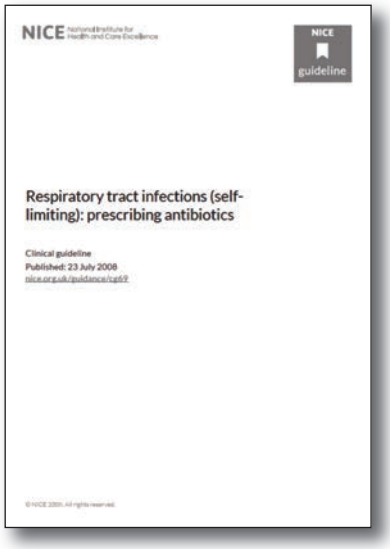
Self-limiting RTIs will resolve on their own without treatment and will have no long term effect on a person's health.

NICE says the duration of uncomplicated RTIs are:

- Acute otitis media: 4 days
- Acute sore throat/acute pharyngitis/acute tonsillitis: 1 week
- Common cold: 10 days
- Acute rhinosinusitis: $2^1/_2$ weeks
- Acute cough/acute bronchitis: 3 weeks

The clinical assessment should include a history (presenting symptoms, use of over-the- counter or self medication, previous medical history, relevant risk factors, relevant comorbidities) and examination to identify relevant clinical signs (temperature, respiratory rate and capillary refill time in children under 5).

It is important to understand why the patient is presenting at this point in their illness and what their ideas, concerns and expectations are.



The NICE 2008 *Respiratory tract infections (self limiting): prescribing antibiotics* guideline says while most patients can be reassured that they are not at risk of major complications, the difficulty for prescribers lies in identifying the small number of patients who will suffer severe and/or prolonged illness or, more rarely, go on to develop complications. The Guideline Development Group struggled to find much good evidence to inform this issue and says this is an area where further research is needed.

How to deal with patients expecting an antibiotic

Dr Gruffydd Jones, GP Principal and Joint Policy Lead PCRS-UK, says many patients will come in expecting antibiotics. The clinician should evaluate whether immediate antibiotics are needed (see box) and if not address their concerns and expectations, explain why an antibiotic will

When should antibiotics be prescribed?

No antibiotics or delayed antibiotic prescriptions should be given when patients have:

- Acute otitis media
- Acute sore throat/acute pharyngitis/acute tonsillitis
- Common cold
- Acute rhinosinusitis
- Acute cough/acute bronchitis.

Unless patients are systemically unwell and/or have:

- Bilateral acute otitis media (in children younger than 2 years)
- Acute otitis media (in children with otorrhoea)
- Acute sore throat/acute pharyngitis/acute tonsillitis when three or more Centor criteria are present:
  - Fever(>38degC)
  - Tender cervical lymphadenopathy
  - Tonsillar exudate
  - Absence of cough
- Signs of community acquired pneumonia (CAP) (see below) - in which case they should be considered for an immediate antibiotic prescribing strategy

Or:

- Patients have signs of developing complications
- If the patient is at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- If the patient is older than 65 years with acute cough and two or more of the following criteria, or older than 80 years with acute cough and one or more of the following criteria:
  - hospitalisation in previous year
  - type 1 or type 2 diabetes
  - history of congestive heart failure
  - current use of oral glucocorticoids

not cure their symptoms and educate them that their condition will be self limiting.

If the patient is still worried, issuing them with a delayed antibiotic prescription can be an effective strategy.

A paper published in the *BMJ* in March 2014 by Paul Little, Professor of Primary Care Research, University of Southampton, and chair of the NICE *Respiratory tract infections (self limiting): prescribing antibiotics* guideline, found that patients judged not to need immediate antibiotics but given a delayed antibiotic prescription resulted in fewer than 40% of patients using antibiotics.[1] Importantly, when these patients were interviewed again they said they would be less likely to come back to the doctor in future because they understood that antibiotics were unlikely to resolve a self limiting infection. Patients given a delayed antibiotic had the same symptom outcomes as those given an immediate prescription.

When the no antibiotic prescribing strategy is adopted, patients should be offered:

- Reassurance that antibiotics are not needed immediately because they are unlikely to make significant difference to symptoms and may have side effects
- A clinical review if their condition worsens or becomes prolonged

When the delayed antibiotic prescribing strategy is adopted, patients should be offered:

- Reassurance that antibiotics are not needed immediately because they are unlikely to make significant difference to symptoms and may have side effects
- Advice about using the delayed prescription if symptoms are not starting to settle in accordance with the expected course of the illness or if a significant worsening of symptoms occurs
- Advice about re-consulting if there is a significant worsening of symptoms despite using the delayed prescription.

Community Acquired Pneumonia (CAP)

The typical symptoms of CAP are acute onset cough, fever, breathlessness and pleuritic chest pain, The BTS Guidelines on Community Acquired Pneumonia 2009 state that a diagnosis of CAP should be considered in the presence of typical symptoms and a patient who is systemically unwell (e.g. temperature > 38 deg C), presence of new focal signs in the chest and no other obvious explanation for these signs.

Recent NICE guidelines on pneumonia say that in primary care a chest X-ray is not essential to make a diagnosis of CAP. They recommend that a point of care C-reactive protein (CRP) blood test should be used to help decide whether patients presenting with mild pneumonia need antibiotics. However Dr Gruffydd Jones says this is an extra refinement which isn't currently available for most clinicians in UK general practice. The test is carried out routinely in a number of other countries but there is a cost issue about buying the equipment for GP surgeries in the UK. For many GP's CRP testing has to be carried out in a local laboratory.

NICE advises:

- do not routinely offer antibiotics if the C-reactive protein concentration is less than 20 mg/litre
- consider a delayed antibiotic prescription if the C-reactive protein concentration is between 20 and 100 mg/litre
- do offer antibiotic therapy if C-reactive protein concentration is greater than 100 mg/litre

NICE also advises GPs to use the CRB65 risk score when making a judgement about whether patients should be referred to hospital. The CRB65 score assigns points based on the criteria of **C**onfusion, raised **R**espiratory rate (>30/min in adults) low **B**lood pressure (<90/60) and older age (≥65).

NICE says GPs can consider home-based care for patients with a score of zero, but should consider hospital assessment for other patients, particularly those with a score of two or higher.

Dr Gruffydd Jones says that clinical judgement is still important especially in the systemically unwell patient.

Treatment of CAP

The vast majority of patients with CAP have a mild form of the disease and can be managed effectively in the community by GPs.

NICE says if an antibiotic is needed patients should be given a five day course of a single antibiotic (e.g. amoxicillin 500mg tds or Clarithromycin 500mg tds) and asked to come back if their symptoms do not improve within three days. Patients should be told their fever will subside within a week but it may take up to six months for them to get completely back to normal.

Management of acute cough in children and adults

Acute cough is a common presentation and whether it's a child or an adult it is usually associated with a viral upper RTI. In the absence of any significant co-morbidity acute cough is likely to be self-limiting clearing up within three weeks. However, 10 to 15% of patients return within one month.

Dr Gruffydd-Jones says the most important differential diagnosis of acute cough in adults is: have they got pneumonia and are they going to require antibiotics?

He recommends a safety net approach - ask patients to report back if their cough is not better in three weeks because this may be the first indication of a chronic condition. In a child it could be the first presentation of asthma or bronchiectasis and it important to remember an inhaled foreign body. In particular, a child who has a persistent wet cough for more than 4 weeks may have persistent bacterial bronchitis, a condition which might need a 2-4 week course of broad spectrum antibiotics.

In an adult it may be the first presentation of COPD, bronchiectasis or lung cancer. Indications which require further investigation in adults include suspicion of inhaled foreign body or haemoptysis, prominent systemic illness, suspicion of lung cancer (Red Flag).

Bronchiolitis

Bronchiolitis is the most common disease of the lower respiratory tract during the first year of life.

Symptoms include:

- a rasping and persistent dry cough
- rapid or noisy breathing
- brief pauses in breathing
- feeding less and having fewer wet nappies
- vomiting after feeding
- being irritable

In primary care the condition may be confused with the common cold though the presence of lower respiratory tract signs (wheeze and/or crackles on auscultation) in an infant would be consistent with bronchiolitis.

The symptoms are usually mild and may only last a few days and can be managed at home without needing treatment. In some cases the disease can cause severe illness and infants will need to be treated in hospital.

Bronchiolitis is a viral infection so antibiotics are not indicated. NICE says corticosteroids are not recommended.

Reference

1. Delayed antibiotic prescribing strategies for respiratory tract infections in primary care: pragmatic, factorial, randomised controlled trial. *BMJ* 2014;**348**:g1606 http://www.bmj.com/content/348/bmj.g1606

The advice in this article has been collated from the following guidelines:

- Respiratory tract infections (self-limiting): prescribing antibiotics. NICE guidelines CG69, July 2008 https://www.nice.org.uk/guidance/cg69
- Pneumonia in adults: diagnosis and management. NICE guideline CG191 December 2014. https://www.nice.org.uk/guidance/cg191
- BTS guidelines of the management of community-acquired pneumonia in adults 2009. https://www.brit-thoracic.org.uk/guidelines-and-quality-standards/community-acquired-pneumonia-in-adults-guideline
- PCRS-UK Opinion sheet on community acquired pneumonia in adults. September 2013 https://www.pcrs-uk.org/system/files/Resources/Opinion-sheets/os33_pneumonia.pdf
- BTS guidelines for the management of community acquired pneumonia in adults: update 2009. http://thorax.bmj.com/content/64/Suppl_3/iii1.full
- BTS guidelines on cough management 2006. https://www.brit-thoracic.org.uk/guidelines-and-quality-standards/cough-in-adults-recommendations
- Bronchiolitis in children: diagnosis and management. NICE guideline. June 2015 https://www.nice.org.uk/guidance/ng9
- Antimicrobial stewardship: system and processes for effective antimicrobial medicine. NICE 2015. http://www.nice.org.uk/guidance/ng15

Learning Objectives

After reading this article you will understand:

- How to deal with a self-limiting RTI
- When antibiotics should be prescribed for an RTI
- How to deal with patients who demand an antibiotic when they don't need one

Ideas for further study and reflection:

- Conduct a search of patients who were given antibiotics for an RTI and ask yourself whether those antibiotics were prescribed appropriately.
- Read the NICE guideline *Antimicrobial stewardship: system and processes for effective antimicrobial medicine use* to find out more about how to use antibiotics effectively
- Are you confident you could spot when a respiratory infection is CAP? Read up the BTS and NICE guidance and download the PCRS-UK opinion sheet on CAP.

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PCRS UK Opinion

Community-Acquired Pneumonia in Adults in Primary Care

Introduction

Community-acquired pneumonia (CAP) is one of the commoner conditions presenting to primary care, with an estimated annual incidence in the UK of between 2 and 5 per 1000 population.[1] A practice comprising 10,000 patients could expect to see around 23 cases per year. The incidence is higher at extremes of age, especially <5 years and >60 years, and there is an association with male sex and socioeconomic deprivation. In the UK, 22-42% of adults with CAP are admitted to hospital. The reported mortality of adults with CAP managed in the community in the UK is less than 1%, compared to mortality rates of around 15% in hospitalised patients.[2]

Prevention of pneumonia

Smoking is an independent risk factor for the development of CAP and there is a dose-response relationship between number of cigarettes smoked and invasive pneumococcal disease.[3] In the UK, adults at risk from pneumonia (including all adults aged >65 years) are eligible for pneumococcal polysaccharide vaccination. Infant pneumococcal vaccination programmes also provide protection to adults via 'herd protection'. In the US, substantial reductions in the absolute numbers of adults admitted to hospital have been observed following a decade of infant pneumococcal conjugate vaccination.[4]

Diagnosing pneumonia

A chest x-ray (CXR) is the definitive test for the diagnosis of pneumonia. However, access to chest radiography is limited in primary care, and therefore most diagnoses are based on clinical criteria. The typical clinical features of CAP - cough, fever, breathlessness, pleuritic chest pain, and lung crackles on examination, are shared by other respiratory conditions such as:

- Non-pneumonic lower respiratory tract infections (LRTI);
- Exacerbations of chronic lung disease, such as chronic obstructive pulmonary disease (COPD);
- Respiratory viral infections, such as influenza

When confronted by a patient with symptoms of a LRTI, there are some helpful pointers in the clinical diagnosis of CAP:

- Duration of symptoms of <24 hours increases the probability of CXR-confirmed CAP.[5]
- 39% of patients treated for LRTI with new focal signs on chest examination will have CXR-confirmed CAP.[6]
- A combination of the following clinical features discriminated patients with CAP from a group of 2,820 patients presenting to primary care with LRTI:[7]
  - breathlessness
  - fever (>37.8°C);
  - crackles and diminished breath sounds on auscultation
  - absence of runny nose;
  - tachycardia >100/min
- Measurement of C-reactive protein with a level of >30mg/l improved discrimination over standard symptom- and sign-based models.[8]

Pleuritic chest pain may be a prominent symptom. It is commoner in younger patients and is not necessarily indicative of a pulmonary embolism. In elderly patients, the classic symptoms and signs of CAP are less likely. Conversely, non-specific features such as confusion and an absence of fever are recognised.

In practice, CAP diagnosed clinically by GPs accounts for 5–12% of all cases of adult LRTI treated with antibiotics. Patients with non-pneumonic LRTI should be treated according to NICE Guidelines which describe 3 antibiotic strategies – no prescribing, delayed prescribing and immediate prescribing [http://guidance.nice.org.uk/CG69]. A no antibiotic or a delayed antibiotic prescribing strategy should be agreed for patients with the common cold or acute bronchitis. If a patient with acute cough is >65 years old and has ≥2 of the following criteria, or >80 years old and has ≥1 of the following criteria, then an immediate antibiotic prescribing strategy is recommended according to NICE guidelines:

- hospitalisation in previous year
- type 1 or type 2 diabetes
- history of congestive heart failure.
- current use of oral glucocorticoids.

Severity assessment & when to refer to hospital

The first and single most important decision in the overall management of CAP is whether to manage the patient in the community or refer to hospital. This decision is best informed firstly by an accurate assessment of the severity of illness at presentation. The vast majority of patients with CAP have low severity disease and are managed effectively in the community by GPs. Strategies to increase the proportion of patients managed in the community have been shown to be both safe and acceptable.[9] Other than pneumonia severity, the commonest reasons for hospital referral/admission are:

- Presence of unstable co-morbid illness (for example, decompensated heart failure);
- Social care needs (for example, living alone);
- Patient wishes.

The clinical judgement of the GP in disease severity assessment is crucial. The British Thoracic Society CAP Guidelines recommend that patients with CAP diagnosed in the community can be classified according to clinical judgement and the CRB65 score (Box 1) into 3 severity groupings based on risk of mortality. Management may be stratified according to severity (Box 2).

Pulse oximeters are becoming increasingly available in primary care, but their precise utility in the management of CAP has still to be decided. Hypoxaemia is associated with poorer outcomes in hospitalised patients with CAP.[2] A low oxygen saturation of <90%, especially in young patients without chronic lung disease, supports a decision to refer to hospital. However, the lack of hypoxaemia does not imply a low risk of adverse outcomes. Therefore, use of pulse oximetry should not replace clinical judgement and the CRB65 score.[10]

GPs should administer antibiotics in the community to patients who have life-threatening pneumonia providing this action does not delay transfer to hospital. Intravenous penicillin G 1.2g or oral amoxicillin 1g are the preferred agents. Concern over the potential effect on subsequent microbiological investigations is not a reason to withhold treatment in these circumstances.

GPs should also consider administering antibiotics in the community for patients with suspected high severity CAP where there are likely to be delays of over six hours in the patient being admitted and treated in hospital. Inappropriate antibiotic use is a major concern both in community and hospital settings. Therefore, the clinical likelihood of CAP needs to be taken into account when consid-

Box 1: CRB65 severity assessment tool.

Score one point for each feature present:

Confusion – new or worse than normal

Respiratory rate ≥ 30/minute

Blood pressure, systolic < 90 mmHg or diastolic ≤ 60 mmHg

Age ≥ **65** years

The views expressed in this publication are not necessarily those of the Primary Care Respiratory Society UK.