Clinical Design & Innovation
Person-centred, co-ordinated care

PAEDIATRICS

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Community Acquired Pneumonia (CAP) in Children

BACKGROUND

Viruses alone are the main cause of pneumonia in younger children (≤2 years) and are less likely to require antibiotics.

In older children, Streptococcus pneumoniae is the most common cause of bacterial pneumonia, followed by mycoplasma and chlamydial pneumonia.[1]

PREVENTION

Smoking cessation

Vaccination (pneumococcal, H influenza, pertussis)

HISTORY

Fast or laboured breathing

Poor feeding (infants)

Fever

Chest pain

Anorexia

Headache

Cough is a non-specific symptom and is often secondary to upper respiratory tract infection

EXAMINATION

Effort [2]

- Recession
- Tachypnoea
- Grunting
- Accessory muscle use
- Nasal flaring

Efficacy of breathing

- Breath sounds (reduced air entry, crackles, bronchial breathing, pleural rub)
- Chest wall indrawing and retractions
- Absent breath sounds and a dull percussion (suspect a pleural effusion[3]

Effects of inadequate respiration

- Heart rate
- Skin colour (pale, cyanosed)
- Mental status (drowsy)

INVESTIGATIONS

Community:

Most children in the community do not require a chest radiograph (CXR).

No other tests are indicated for a child with suspected CAP in the community.[1]

Hospital:

- Renal profile
- FBC and blood film
- CRP is not useful in differentiating between viral and bacterial pneumonia but may be helpful in monitoring response to therapy.[1]
- Nasopharyngeal secretions for detection of influenza.
- Testing for other viral pathogens will not change management.
- Blood cultures are low yield, more likely to be positive in severe pneumonia, empyema and effusion.
- CXR should be performed if severe or complicated pneumonia is suspected (not recommended in the routine use)[1]

RED FLAGS / REFERRAL TO HOSPITAL

- Hypoxia (<92%)
- Grunting or chest wall indrawing
- Appears septic or shocked
- Respiratory rate:
  (i) > 70 breaths/minute in an infant
  (ii) > 50 breaths/minute in a child.
- Symptoms not improving despite treatment with antibiotics.

COMPLICATIONS

Pleural effusion

Empyema

Necrotising pneumonia

Septicaemia

Haemolytic uraemic syndrome (HUS)

ANTIBIOTICS

First-line treatment

- Amoxicillin PO
- Azithromycin PO if the patient has received a course of amoxicillin/co-amoxiclav in the community or atypical infection is suspected[5]
- Co-amoxiclav if pneumonia post-influenza or aspiration pneumonia[1]

If clinically unwell admit to hospital.

Pneumonia without signs of sepsis or effusion:

As above

IV fluids at 2/3 maintenance

Severe pneumonia / sepsis:

Cefuroxime IV

Azithromycin PO

Oral therapy is safe and effective in hospitalised children with severe pneumonia who do not have serious signs or symptoms[6]

FOLLOW UP RADIOGRAPHY

Not required in those who were previously healthy and who are recovering well.

Follow-up CXR is recommended after 4–6 weeks for:

- Complicated pneumonia
- Round pneumonia
- Persistent signs
- Recurrent pneumonia involving the same lobe or if initial suspicion of a chest mass, anatomical abnormality or foreign body.

TAKE HOME MESSAGES

Chest wall in drawing and tachypnoea >50 breaths per minute are positive predictive factors for CAP[1]

Macrolides and cephalosporins are less effective against pneumococcal pneumonia in children, compared to amoxicillin[4].

Wheeze is almost never present in pneumonia – consider other causes of childhood wheeze.

Consider antivirals for acute influenza in the absence of findings that suggest bacterial infection.

Ref: Pneumonia Guidelines 10/23. CDI/0068/2.0/2023

For references see reverse

REFERENCES:

1. Harris M, Clark J, Coote N, Fletcher P, Harnden A, McKean M, et al. British Thoracic Society guidelines for the management of community acquired pneumonia in children: Update 2011. Vol. 66, Thorax. 2011.
2. ALSG. The structured approach to the seriously injured child. Vol. Chapter 13. 2015.
3. The Royal Children's Hospital Melbourne. Community acquired pneumonia. Clinical Practice Guidelines. 2020.
4. Health Service Executive. Community Acquired Pneumonia in Children - LRTI. Antibiotic Prescribing - Conditions and Treatments. 2019.
5. Children's Health Ireland Antimicrobial Guidelines 2020 Departments of Pharmacy, Infectious Diseases and Microbiology Children's Health Ireland at Crumlin, Temple Street and Tallaght.
6. Rojas-Reyes MX, Granados Rugeles C. Oral antibiotics versus parenteral antibiotics for severe pneumonia in children. Cochrane Database of Systematic Reviews. 2006 Apr 19;

GUIDELINES:

(i) CHI CAP guideline

(i) CHI antimicrobial guideline

(i) RCH melbourne guidelines

(i) BTS guidelines

(i) ALSG

BTS GUIDELINES

A. Children with community acquired pneumonia should not have a CXR performed where there is no clinical evidence of severe or complicated pneumonia

B. Children with community acquired pneumonia who can tolerate oral fluids should not receive intravenous antibiotics where there is no evidence of septicaemia or complicated pneumonia

C. Children with community acquired pneumonia should only have hospital follow-up

D. "Complicated pneumonia" occurs when there is a complication such as parapneumonic effusion, empyema, lung abscess, or necrotising pneumonia