

Review Article

Guideline based management of community acquired pneumonia

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Pneumonia is a common clinical condition confronted by general practitioners as well as chest physicians¹. The annual incidence varies in different age groups. It is common in children aged <5 years and in elderly people. It is more common in those with co-morbidities eg. COPD, bronchiectasis, chronic cardiac and kidney diseases. Almost one third of patient with community acquired pneumonia needs hospital admission, of which about 5-10% are admitted in ICU. The overall mortality from community acquired pneumonia (CAP) is 5-10%^{2,3}.

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Key words : Pneumonia, COPD, bronchiectasis, chronic cardiac and kidney diseases.

There is plethora of information on pneumonia, but one may find it difficult to make critical decisions at times. There are a lot of evidence based guidelines to guide treatment strategies. Keeping the Indian health care scenario in consideration, Indian Chet Society & National College of Chest Physicians (India), jointly published the Indian Guidelines for diagnosis and Management of Pneumonia.

Symptoms and Signs of Pneumonia :

Classically a patient of pneumonia presents with abrupt onset of cough with or without expectoration, shortness of breath, and pleuritic chest pain. The clinical history may include one or more of :

- Fever > 37.7degree Celsius, chills & rigor, and/or severe malaise, and
- New focal chest signs on examination (bronchial breath sound/ and or crackles)

Clinically a person with above described symptoms can be leveled as a case of pneumonia in the absence of any other explanation for the illness.

What Investigations to do :

There is high level of evidence suggesting wherever feasible, a chest radiograph should be obtained in all patients suspected to having CAP.

If chest radiography is not available, even then, the patient must be treated on clinical suspicion as delayed treatment may lead to high mortality risk.

Repeat chest radiography is not needed if patient is clinically improving. It is recommended only if there is persistence or worsening of symptoms/ physical signs¹.

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Role of CT in the Diagnosis of CAP :

Most of the guidelines, including Indian guidelines do not recommend routine CT of thorax for diagnosis of CAP. CT of chest should only be performed in non-resolving pneumonia and for the assessment of complication of CAP¹.

Microbiological Investigations :

(a) **Sputum Gr. Stain & Culture** — Indian Guideline favors initial gram stain & culture in all hospitalized patients of CAP.

In patients not responding to usual treatment Sputum for AFB should be obtained & examined.

(b) **Blood Culture** — Blood culture are not required in routine outpatient management of CAP. It is only been advocated in hospitalised patients with CAP.

The other microbiological tests like pneumococcal antigen detection, Legionella antigen detection is not routinely done. These tests are desirable only in patients with severe CAP.

General Investigations :

The Indian guideline categorically recommends only chest X-ray in out patient setting¹.

The next important test is pulse oximetry. It is desirable even in out-patients.

Blood Glucose, urea, serum electrolytes should be done in all hospitalized patients.

Complete Blood count & Liver function tests helps in the management of CAP.

Role of Biomarkers :

Procalcitonin and CRP is not needed to be performed as routine investigation for CAP diagnosis¹.

Risk Stratification :

All patient of CAP should be risk stratified¹.

The risk stratification must be done in stepwise manner. First step is to stratify the need of hospitalization followed by assessment of the site of admission i.e. non ICU versus ICU.

The risk stratification is done through clinical judgment and by objective severity scores.

Pulse oximetry can be used to assess hypoxaemia & admission.

Hypoxaemia is defined as pulse oximetric saturation \leq 92% for patients younger than 50 years of age, for more older patients it is \leq 90%.

There are many objective scoring systems in place. The Indian chest society and the British Thoracic Society recommend the CURB 65 and its derivative CRB 65, scoring system.

This is as follows :-

Score 1 for each of

C = mental confusion

U = Blood urea $>$ 7 m.mol/l.

R = Respiratory rate \geq 30/min.

B = Systolic Blood Pressure $<$ 90mm.of Hg or diastolic blood pressure \leq 60mm.of Hg.

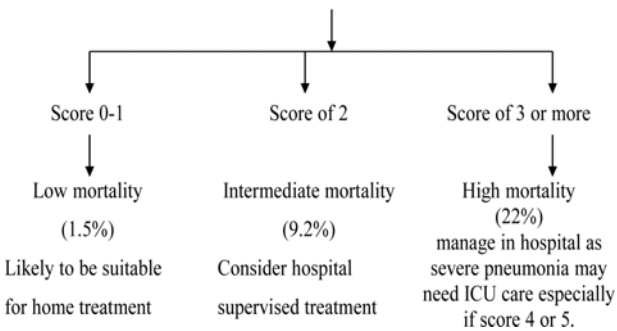
65 = Age \geq 65 years.

The total score may vary from 0-6 for CURB 65 and 0-5 for CRB 65 (urea is omitted).

The score relates to mortality and also defines management strategy.

As per Guideline :

CURB-65/CRB65 Score (1-2-3)



How to Treat :

Pneumonia must be treated with the appropriate antibiotics, and it must be given as early as possible.

The therapy is targeted towards coverage the most common organism ie, S pneumoniae.

The out patients without co-morbidities are treated with oral macrolide viz. Azithromycin or oral Beta- lactams like amoxicillin 500-100 mg three times daily.

The out patients with co-morbidities should be treated with combination of macrolide & Beta-lactams.

The guidelines prohibit use of Fluroquinolones as empirical therapy.

The antibiotic therapy for hospitalized patients is slightly more aggressive.

In non-ICU setting the recommendation is to use combination of B-lactam plus a macrolide. The preferred Beta- lactam include cefotaxime, ceftriaxone and Amoxycillin- Clavulanic acid.

The route of administration either oral or parenteral should be decided as per condition of patient and clinical judgment.

In ICU patients the antimicrobial therapy is directed towards suspected causative agents and is usually changed according to specific pathogen if isolated.

If a patient does not respond to treatment in 48-72 hours, the patient should be evaluated for non-response like development of complications, presence of atypical pathogens and drug resistance.

Doses of drugs used in CAP (1)

Drug	Doses
Amoxicillin	- 0.5-1 gm thrice daily (oral/I.V.)
Co-amoxiclav	- 625 mg t.i.d. to 1 gm b.d. (orally)/ 1.2 gm ti.d. I.V.
Azithromycin	- 500 mg daily (oral/I.V.)
Ceftriaxone	- 1-2 gm b.d. (I.V.)
Cefotaxime	- 1 gm t.i.d. (I.V.)
Cefepime	- 1-2 gm b.d. to t.i.d. (I.V.)
Ceftazidime	- 2 gm t.i.d. (I.V.)
Piperacillin-tazobactam	- 4.5 gm q.i.d. (I.V.)
Imipenam	- 0.5-1 gm t.i.d. to q.i.d. (I.V.)
Meropenam	- 1 gm t.i.d. (I.V.)

Intravenous antibiotics should be changed to oral, upon resolution of patient's fever, improved oxygen status and haemodynamic stability¹.

Duration of Treatment :

The duration of treatment varies as per severity of disease and causative organism.

The out patients are usually given antibiotics for 5 days. While the in-patients are given antibiotics for seven days. However, antibiotic treatment may be extended in patients who are infected with Legionella sp., S. aureus and Gram - negative bacteria. These patients should receive antibiotics for 14-21 days¹⁻³.

When to Discharge from Hospital :

It is safe to discharge the patient to home once Pt. is clinically improved and stable. The signs of clinical improvement and stability are - Afebrile, haemodynamically stable for at least last 48 hours, mentally clear and accepting orally¹.

Adjunctive Therapy :

Corticosteroid is only used in septic shock or ARDS secondary to CAP, according to the prevalent treatment

protocol for these conditions.

Non-invasive ventilation (NIV) may be given to the patients of CAP with acute respiratory failure.

There is no role of other adjunctive therapy¹.

Patient Review :

All hospitalized patients of pneumonia should be reviewed about six weeks of discharge. Patients with poor clinical recovery a repeat chest radiograph should be done to identify underlying malignancy^{2,3}.

Summary :

- Pneumonia is very much common in community and has significant mortality.
- The assessment of disease severity clinically and aided by severity assessment score is key to management.
- Antibiotic management is initially empirical and should be guideline derived and as per local microbial pattern and resistance rates.

REFERENCES

- 1 ICS/NCCP (I) Guidelines for management of community and Hospital acquired pneumonia in Adults. *Lung India* 2012; 527-62.
- 2 BTS guidelines for the management of CAP in adults. *Thorax* 2001; 56: 1-64.
- 3 Macfarlane JT, Boldy D — Uptade of BTS guidelines : What's new ? *Thorax* 2004; 59: 364-6
- 4 Oxford Handbook of Respiratory Medicine 2014; 418-33.

Algorithmic Approach to Management of CAP

- Cough, SOB, Pleuritic chest pain of less than a week, with
- One or more of systemic features - Fever $> 37.7^{\circ}\text{C}$ chills and rigor, and/or severe malaise AND
- New focal signs like bronchial breathe sound/ crackles with
- No other feasible explanation of above features.

