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Clinical Features of Community Acquired Pneumonia

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Abstract

The common symptoms of community acquired pneumonia (CAP) include fever with chills and/or rigors, productive cough, dyspnoea and pleuritic chest pain. These are typically of less than one week duration. Presence of bronchial breath sounds, whispering pectoriloquy, localized crackles and tachypnoea are important signs. However, host and microbial factors can alter the presentation of CAP such that typical symptoms and signs may not always be present. Even the onset of symptoms and their mean duration before presentation may vary in such cases. This is particularly true in extremes of ages and presence of comorbidities. Mental confusion and disorientation is a common feature in the elderly who may not manifest with the classical clinical features. Gastrointestinal symptoms are most often reported in atypical pneumonia. Assessment of severity is essential to determine the optimal site for management. Although several severity assessment tools have been proposed, presence of shock and/or acute hypoxemic respiratory failure invariably mandates admission to an intensive care unit. In less severe cases, the decision to hospitalize may be individualized with the help of any of the severity assessment tools available as well as other adverse prognostic factors.

Key Words: Community acquired pneumonia, severity assessment, symptoms, signs, prognostic factor.

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Introduction

While evaluating patients of community acquired pneumonia one should obtain detailed history with particular emphasis on the following features which would be helpful in making a probable etiologic diagnosis and initiating empirical antimicrobial therapy at the earliest.

1. The clinical settings in which pneumonia has occurred
2. Defects in host resistance that could predispose to the development of pneumonia (e.g. co-morbidities)
3. History of possible exposure to specific pathogens

While taking history, one should also look into the type of onset and the mean duration of symptoms before presentation. It has been seen that pneumococcal pneumonia generally has the shortest duration of symptoms before presentation. Helms *et al* (1) observed that the mean duration of symptoms was 2.9 days with pneumococcal pneumonia, 4.6 days with Legionella pneumonia and 12.6 days in case of pneumonia due to *Mycoplasma pneumoniae* infection. However, in elderly population, a clear history about the time of onset of illness is less often elicitable.

Symptoms and Signs of CAP

Symptoms of CAP include abrupt onset of fever with chills and rigors, cough with expectoration, shortness of breath and pleuritic pain. Mental confusion occurs more frequently in the elderly and is an adverse prognostic factor. Physical examination may reveal tachypnoea and a localized area of bronchial breath sounds, inspiratory crepitations and whispering pectoriloquy. Presence of cyanosis, respiratory rate > 30 breaths/ minute and hypotension are adverse prognostic factors.

Fever

Though fever has been reported in upto 87% patients of community acquired pneumonia, it is a non – specific feature. Febrile response may be observed less commonly in elderly patients which may make early diagnosis difficult. Absence of fever in bacteremic cases of pneumonia may be associated with poor prognosis. Chills are more frequently encountered in pneumonia than rigors. Rigors are more frequently observed in pneumococcal pneumonia (62%) with a higher rate in younger patients. It is less frequent in elderly and in atypical infection.

Cough

Cough is one of the most frequently reported symptoms (88%) in community

acquired pneumonia. It is less frequently noticed in the elderly. In a comparative study (1) it was found that the incidence of cough was maximum in subjects with Mycoplasma pneumonia (100%), whereas in pneumococcal pneumonia it was observed in 83% cases and in only 50% cases in case of Legionella pneumonia.

In patients admitted with CAP, cough is often associated with sputum production (50-60%) and about half of these reported purulent expectoration. Occasionally the colour of sputum may provide some clue in making possible etiologic diagnosis. Rusty (bloody) sputum is classically noted in pneumococcal pneumonia but it may sometimes be seen in other suppurative infections and in patients of community acquired pneumonia taking anti coagulation therapy. Similarly, Klebsiella pneumonia patients often show red currant- jelly sputum.

Dyspnoea

Presence of dyspnoea often varies widely in different studies with a reported range of 40-90%. There are different mechanisms in the causation of dyspnoea in community acquired pneumonia. First dyspnoea may be due to hypoxemia and tachypnoea. Secondly, it may be due to stimulation of stretch receptors in areas of lungs with decreased compliance due to consolidation. Third, about 40% of patients of community acquired pneumonia develop parapneumonic effusion and dyspnoea may be due to decreased thoracic excursions from pleuritic chest pain. Elderly subjects with CAP may have decreased perception of dyspnoea which may be responsible for delay in making diagnosis in this subset of patients.

Pleuritic Chest Pain

It has been reported in 31-72% cases of community acquired pneumonia. It is most frequently observed in cases of pneumococcal pneumonia, prevalence of chest pain decreases with age.

Gastrointestinal symptoms are most often reported in pneumonia caused by atypical pathogens. Most commonly reported symptoms are nausea, vomiting, anorexia, diarrhea etc. Some patients may present with myalgia (27%), arthralgia (16%) and headache (29%). Coryza and sore throat are more common in acute bronchitis than in pneumonia. In a study done at our institute amongst CAP patients (2), the most frequently reported symptoms were fever (90%), cough (97%) and pleuritic chest pain (34%). Altered sensorium was noted in 8.5% cases.

Crackles

Crackles are observed in upto 80% of patients with community acquired pneumonia on admission. This sound is due to reopening of distal atelectatic lung units during inspiration. In a study by Lehtomaki *et al* (3), crackles were more prevalent in mixed infection (70%) and pneumococcal pneumonia (63%) but less common in adenoviral infection (27%). Piirila *et al* (4) showed that characteristic of crackles undergo changes during the course of pneumonia. Initially they were mid inspiratory but after 3 days they were heard later in inspiration.

In the elderly, pneumonia often presents with different signs and symptoms than in younger patients. Classical pneumonic symptoms are often absent or minimal. They often present with extra pulmonary symptoms like weakness, confusion, incontinence of urine, etc. This atypical manifestation of pneumonia in the elderly may be due to impairment in host defense mechanism.

Mycoplasma Pneumonia

Mycoplasma pneumonia often presents with multiple extra pulmonary manifestations which may be due to development of humoral immune response. Japanese respiratory society proposed a guideline in 2006 for identifying pneumonia caused by atypical pathogens (Table 1). (5)

Table 1: Differential diagnosis of atypical pneumonia and bacterial pneumonia

1. Age < 60 years old		
2. No or mild co-morbidity		
3. Persistent cough		
4. Limited chest auscultatory findings		
5. No expectoration or pathogens on rapid diagnostic tests		
6. WBC count < 10,000/mm^3		
Differential diagnosis	**Atypical suspect**	**Bacterial suspect**
1 - 5 items	≥ 3 parameters	≤ 2 parameters
1 - 6 items	≥ 4 parameters	≤ 3 parameters

Severity Assessment

Assessment of the severity of community acquired pneumonia is essential to decide the site of care. There are several severity assessment criteria available including Pneumonia severity index (PSI), CURB – 65 (British Thoracic Society; BTS), modified American Thoracic Society (ATS) criteria and IDSA-ATS guidelines 2007.

Modified ATS Criteria (6)

Admission to the ICU is needed for patients with severe CAP defined as the presence of either one of two major criteria, or the presence of two of three minor criteria. The major criteria include need for mechanical ventilation and septic shock; the minor criteria include systolic blood pressure (BP) = 90 mm Hg, multilobar disease, and PaO_2/FiO_2 ratio < 250.

IDSA-ATS Guidelines (7)

In 2007 Infectious Disease Society of America (IDSA) published guidelines for the management of community acquired pneumonia and they proposed severity assessment criteria (Table 2) to identify the optimal site of care for pneumonia patients. Direct admission to ICU is recommended in patient with one major criterion or three of the minor criteria for severe CAP.

CURB-65 (8, 9)

This is a constellation of five "Core" clinical adverse prognostic factors, proposed by BTS.

- **C**onfusion (new onset)
- **U**rea (>7 mmol/L or 42 mg/dL)
- **R**espiratory rate (>30/min)
- **B**lood pressure (systolic BP <90 mm Hg *and/or* diastolic BP <60 mm Hg)
- **65** years or more (age)

Patients with a CURB-65 score of =3 are at high risk of death and should be considered to have severe CAP. Those with a score of 2 are at some increased of risk of death and should be considered for inpatient treatment while those with a score of 0 or 1 are at low risk of death and may be suitable for home treatment. In addition, there are two other clinical adverse prognostic factors, which if present, indicate severe CAP and the need for hospitalization:

- Hypoxaemia: SaO_2 <92% or PaO_2 <8 kPa (60 mm Hg) regardless of FiO_2
- Bilateral or multilobe involvement on chest radiograph

In routine practice, it is easier to measure CURB - 65 as less number of variables are needed to be measured.

Table 2: Severity assessment criteria of pneumonia proposed by IDSA and ATS

Major Criteria
Invasive mechanical ventilation
Septic shock with the need for vasopressors
Minor Criteria
Respiratory rate = 30 bpm
PaO2/FiO2 = 250
Multilobar infiltrates
Confusion/ disorientation
Uremia (BUN = 20 mg/dl)
Leukopenia < 4000 cells/ mm3
Thrombocytopenia (platelet count < 100,000 cells /mm3)
Hypothermia (core temperature < 36° C)
Hypotension requiring aggressive fluid resuscitation
Other Minor Criteria
Hypoglycemia in non diabetic
Acute alcoholism or alcohol withdrawal
Hyponatremia
Unexplained metabolic acidosis
Cirrhosis
Asplenia
ICU admission indicated for patients with:
≥ 1 major criterion
≥ 3 minor criteria

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