

Study of clinical and etiological profile of community acquired pneumonia in elderly patients

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Abstract:

Introduction: Community acquired pneumonia is a leading cause of morbidity and mortality in elderly. Despite the advent of potent antimicrobials and effective vaccines, community acquired pneumonia is a common and serious illness. In developing countries like India it is the most common cause of hospital attendance in the geriatric population. Hence, this study was done to study the clinical and etiological profile of community acquired pneumonia in elderly patients.

Aim: 1. To study the clinical profile of community acquired pneumonia in elderly patients.

2. To study the etiological profile of community acquired pneumonia in elderly patients.

Methods: A total of 50 elderly patients diagnosed to have community acquired pneumonia were studied prospectively from January 2013 to December 2014. Patients aged 60 years and above with clinical and radiological features compatible with community acquired pneumonia were included in the study. The diagnosis of a case of community acquired pneumonia was based on British thoracic society guidelines.

Result: Mean age was 72.88 ± 7.62 years, and 64% of the patients were males. Smoking (56%) and Type 2 diabetes mellitus (46%) were the most common predisposing conditions. 36% of the patients had typical pneumonia, 22% had atypical pneumonia, and in 42% of the patients no organism could be isolated. *Streptococcus pneumoniae* (18%), *Klebsiella pneumoniae* (8%), and *Legionella pneumophila* (8%) were the most common organisms isolated. Lobar pneumonia (72%) was the most common radiological finding. Mortality was 10%.

Conclusion: A rational antibiotic guidelines can be made only if studies are done in different parts of the country to know the regional variations in etiology of CAP in elderly.

Keywords: Atypical pneumonia, Community acquired pneumonia, *Streptococcus pneumoniae*.

I. Introduction

Community acquired pneumonia (CAP) is ranked as fourth leading cause of death.^[1] Though definite statistics are lacking from India, CAP remains a leading cause of death in our country.^[2] CAP is increasingly being recognized among geriatric patients and those with co-morbid illnesses. Such illnesses include chronic obstructive pulmonary disease (COPD), diabetes mellitus, chronic kidney disease, congestive heart failure, ischaemic heart disease (IHD), malignancy, and chronic liver disease.^[3] Advent of a number of new antimicrobial agents and the evolution of bacterial resistance mechanisms exemplify the need to know the etiological pattern in each region.

Aims and Objectives

1. To study the clinical profile of community acquired pneumonia in elderly patients.
2. To study the etiological profile of community acquired pneumonia in elderly patients.

II. Materials And Methods

This was a prospective observational study and was conducted between January 2013 and December 2014. 50 elderly patients satisfying the inclusion criteria and admitted in the department of Medicine of M S Ramaiah hospital were included in the study. The diagnosis of CAP was considered in any patient who had newly acquired respiratory symptoms (cough, sputum production, and/ or dyspnoea), especially if accompanied by fever and auscultatory findings of abnormal breath sounds and crackles and at least one opacity on chest radiograph.

Inclusion criteria

All patients aged 60 years and above, fulfilling the criteria for CAP as per British thoracic society guidelines were included in the study.^[4]

Exclusion criteria

1. Patients <60 years of age.
2. Patients with hospital acquired pneumonia or ventilator associated pneumonia
3. Patients with radiographic evidence of pulmonary tuberculosis and lung cancer

Demographic data, history, vital signs, level of consciousness and respiratory system examination findings were noted in all the patients.

Laboratory methods

Following a detail history and clinical examination, the following blood investigations were sent in all the patients – complete blood count, renal function tests, and liver function tests. Chest X-ray was done in all the patients. Sputum and blood culture were sent in all the patients. In addition, patients with a provisional diagnosis of atypical pneumonia with no etiology established from blood and sputum cultures were subjected to indirect immunofluorescent assay for diagnosis of the following atypical agents - Legionella pneumophila, Mycoplasma pneumoniae, Coxiella burnetii, Chlamydia pneumoniae, Adenovirus, Respiratory syncytial virus, Influenza A, Influenza B, and Parainfluenza1,2,3.^[5]

III. Results

A total of 50 cases were studied. Basic details such as demography, clinical features, and laboratory characteristics were collected. Mean age of the patients studied was 72.88±7.62 years. 64% of the patients were males, and 36% of the patients were females. Smoking (56%) and Diabetes mellitus (46%) were the most common predisposing conditions. (Table 1) Cough was the most common presenting complaint and was seen in 84% of the patients. Fever and sputum production were seen in 78% and 70% of the patients respectively.

Altered sensorium (18%) and gastrointestinal symptoms (10%) were the most common extra pulmonary symptoms. (Table 2) 84% of the patients were tachycardic and 74% of the patients were tachypneic. (Table 3) Crackles were heard in 80% of the patients and bronchial breath sounds were heard in 30% of the patients. 86% of the patients had leukocytosis (total count >11000cells/cumm) and 8% of the patients had leucopenia (total count <4000 cells/cumm). 36% of the patients had typical pneumonia and 22% of the patients had atypical pneumonia. (Table 4) Streptococcus pneumoniae (18%) and Klebsiella pneumoniae (8%) were the most common organisms responsible for typical pneumonia. Legionella pneumophila (8%) and Chlamydia pneumoniae (6%) were the most common organisms responsible for atypical pneumonia. (Table 5) 72% of the patients had radiological features of lobar pneumonia and 20% had radiological features of bronchopneumonia. (Table 6) Mortality was seen in 5 patients (10%).

Table 1- Predisposing conditions

Predisposing conditions	Number (n=50)	Percentage (%)
Smoking	28	56
Diabetes mellitus	23	46
COPD	13	26
Alcohol	9	18
Hypertension	8	16
Ischaemic heart disease	7	14
Cerebrovascular accident	3	6
Bronchial asthma	2	4

Table 2 - Clinical features

Symptoms	Number (n=50)	Percentage (%)
Cough	42	84
Fever	39	78
Expectoration	35	70
Breathlessness	12	24
Chest pain	10	20
Altered sensorium	9	18
Gastrointestinal symptoms	5	10
Hemoptysis	4	8

Table 3 –Vital signs

Vital sign	Number (n=50)	Percentage (%)
Temp>38 ⁰ C	39	78
Tachypnea (Respiratory rate> 24)	37	74
Tachycardia (Heart rate >100)	42	84
Hypotension (SBP < 90mmHg)	9	18

Table 4 – Classification of pneumonia based on isolation of organisms on cultures

Total leukocyte count	Number (n=50)	Percentage (%)
Typical	18	36
Atypical	11	22
Undiagnosed	21	42

Table 5 – Bacteria isolated on culture

Bacteria isolated	Number (n=50)	Percentage (%)
Streptococcus pneumoniae	9	18
Klebsiella pneumoniae	4	8
Legionella pneumophila	4	8
Chlamydia pneumoniae	3	6
Hemophilus influenzae	2	4
Coxiella burnetti	2	4
Escherichia coli	2	4
Staphylococcus aureus	1	2
Mycoplasma pneumoniae	1	2
Influenza virus	1	2

Table 6 – Radiological findings

Radiological finding	Number (n=50)	Percentage (%)
Lobar pneumonia	36	72
Bronchopneumonia	10	20
Interstitial pneumonia	4	8
Pleural effusion	4	8

IV. Discussion

Pneumonia is defined as inflammation and consolidation of lung tissue due to an infectious agent. In pneumonia the microbial infection involves the terminal airways and alveoli of the lung. Pneumonia that develops outside the hospital is considered community acquired pneumonia. Most common organisms causing community acquired pneumonia are Streptococcus pneumoniae, Klebsiella pneumoniae, Hemophilus influenzae and Staphylococcus aureus.^[6] Atypical pneumonia is characterized by minimal sputum that does not reveal a predominant microbial etiology on routine smears (Gram stain, Ziehl Neelsen stain) or cultures. For more than half the cases of CAP, no definite causative pathogen can be identified. In India, atypical organisms are rarely isolated from patients with CAP, mainly due to lack of facilities for culture/serology of these organisms. Studies have shown that the incidence of CAP increases with age and is highest among the elderly, indicating that the pneumonia burden is growing in this era of global population aging.^[7-9]

In our study the mean age of the patients was 72.88±7.62 years and 64% of the patients were male. Similar findings were noted by Kun Xiao et al where the mean age of the patients was 75±8 years and 59.6% of the patients were males.^[10] Smoking was the most common predisposing condition in our study; 56% of the patients were smokers. This is comparable to study done by Kobashi et al and Torres et al, where 60% and 62% of the patients were smokers respectively.^[11-12] In our study diabetes mellitus was the most common comorbid condition and was seen in 46% of the patients. But in a study done by Bilal et al COPD was the most common comorbid condition, and was seen in 48% of the patients.^[13] Most common presenting symptoms were cough (84%) and fever (78%). Similar finding were observed by Torres et al where 81% of the patients presented with cough and 76% of the patients presented with fever.^[12] Septic shock secondary to CAP is commonly seen in elderly, and this may account for hypotension seen in 18% of the patients. Among the laboratory investigations leukocytosis was seen in 86% of the patients and leucopenia was seen in 8% of the patients. Bilal et al noted leukocytosis in 84% of the patients and leucopenia in 8% of the patients.^[13] Streptococcus pneumoniae was the most common organism isolated (18%), similar findings have been noted in studies done by Bilal et al and Kun Xiao et al where Streptococcus pneumoniae was the most common organism isolated (16% and 11.1% respectively).^[10,13] Lobar pneumonia was the most common radiological finding in studies done by Torres et al and Bilal et al, and was found in 82% and 78% of the patients respectively. In our study also, lobar pneumonia was the most common radiological finding and was seen in 72% of the patients.^[12-13]

V. Conclusions

The clinical presentation and etiology of CAP in elderly differs from that of other population. Hence local epidemiologic data on the etiologies of elderly patients hospitalized with community-acquired pneumonia (CAP) is needed to develop guidelines for clinical practice.

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