



BACTERIOLOGICAL AND CLINICAL PROFILE OF COMMUNITY ACQUIRED PNEUMONIA AMONG ELDERLY PATIENTS

Clinical Microbiology

Dr. S. A. Siva Subramaniam

Junior Resident, Grant Govt Medical college and JJ hospitals, Mumbai.

Dr. I. M. Rejitha*

Assistant Professor, Dept Of Microbiology, Tirunelveli Medical College. *Corresponding Author

ABSTRACT

Community acquired pneumonia remains a common and serious illness despite availability of potent new antimicrobials. Community acquired pneumonia in elderly patients has peculiar clinical characteristics. This study included 50 elderly patients aged 65 years and above with Community Acquired Pneumonia (CAP). This study was done to understand the mode of presentation, its clinical features, bacteriological and radiological features for the early detection of causative agent of the disease. Out of the 50 patients 28 were admitted in the intensive care unit. Smoking was the most common risk factor among the patients. Almost all the patients presented with cough and fever. Crepitations were observed in most patients. Chest X ray finding revealed lobar pneumonia in 39 patients. The most commonly affected lobe was right lower lobe followed by left lower lobe. One patient was positive for acid fast bacilli in sputum. Sputum culture was positive in 22 cases. *Klebsiella pneumoniae* (9) was the most frequent isolate followed by *Pseudomonas aeruginosa*. *S. pneumoniae* was isolated in 3 patients. Majority of the Gram negative isolates were most sensitive to Aminoglycosides.

KEYWORDS

Community acquired pneumonia, *Klebsiella pneumoniae*

INTRODUCTION

Pneumonia is one of the most common infectious illness encountered in the clinical practice. It is defined as a syndrome caused by acute infection, usually bacterial, characterized by clinical and/or radiographic signs of consolidation of a part or parts of one or both lungs.¹ Community acquired pneumonia (CAP) refers to pneumonia acquired outside of hospitals.² CAP remains a common and serious illness despite availability of potent new antimicrobials. Since pneumonia is not a reportable illness, information about its incidence is based on crude estimates. As many as four million cases of CAP occur annually worldwide and as much as 20% require hospitalization.³

The etiological agent of CAP varies with geographical distribution e.g. *Streptococcus pneumoniae* predominates as etiological agent of CAP in Europe, United States, UK and *Klebsiella pneumoniae* is the most common pathogen leading to admission to a medical intensive care unit in Singapore.^{4,5,6} In India *S. pneumoniae* is the commonest etiological agent in Delhi whereas *Pseudomonas aeruginosa* predominates in Ludhiana.^{7,8}

Elderly patients with community acquired pneumonia constitute a special population since they commonly have various underlying illnesses and nutritional deficits. Pneumonia is increasingly common among older patients with co-morbidity like chronic obstructive pulmonary disease (COPD), diabetes mellitus (DM), chronic renal failure, congestive heart failure (CHF) and other conditions.

Community acquired pneumonia in elderly patients has peculiar clinical characteristics. For instance not all signs and symptoms of pneumonia are present in all cases. The clinical presentation may consist only of alterations of patient's general condition, confusion or decompensation of underlying illness. The incomplete clinical picture of community acquired pneumonia in elderly may be associated with a delay in establishing diagnosis and consequently in starting antibiotic therapy.

Hence this study was undertaken in this tertiary hospital to provide information concerning the bacteriological & the clinical profile of Community Acquired Pneumonia among elderly patients from this part of the country.

MATERIALS AND METHODS

This study included 50 elderly patients aged 65 years and above with Community Acquired Pneumonia (CAP) who were treated at Government Medical College Hospital Tirunelveli. This study was done to understand the mode of presentation, its clinical features, bacteriological and radiological features for the early detection of causative agent of the disease. Patient consent and Institutional ethical committee clearance were obtained.

The presenting symptoms and risk factors such as diabetes, smoking, congestive cardiac failure, liver and renal diseases, etc were identified. A detailed history was obtained. The presenting symptoms and signs were noted in a proforma. Radiological findings and relevant blood investigation results were noted.

Early morning sputum samples were obtained and subjected to sputum microscopy (Grams stain and AFB staining) and culture. Sputum sample was inoculated on Blood Agar, Chocolate Agar & MacConkey Agar plates. The inoculated plates were incubated at 37 degree celsius for 24 - 48 hours. The culture isolates were further identified by using various biochemical reactions up to genus/species level.

Antibiotic sensitivity testing for bacterial isolates was done by the Modified Kirby-Bauer disc diffusion method according to the Clinical and Laboratory Standards Institute (CLSI) guidelines.⁹ The antibiotic discs used were Trimethoprim-sulfamethoxazole, Ampicillin, Gentamycin, Amikacin, Ciprofloxacin, Cefotaxime, Ceftazidime, Imipenem and ceftazidime with clavulanic acid. The source of antibiotic discs were Hi Media India.

RESULTS AND DISCUSSION

In this study, 50 patients were observed and majority 66 % of the patients were males when compared to females 34%. The mean age of the patients was 74.52 years. Thus males were the predominant group included in this study. This could be due to the fact that the study was conducted among elderly people in a hospital which caters basically to a rural population. Men probably had more access to the hospital facilities than women. 28 patients were admitted in the ICU and 22 of them were admitted in the medical and surgical wards.

In this study the most common predisposing risk factors in cases of CAP were smoking (66%) and alcoholism (14%). All the male patients in this study had history of smoking. The most common underlying co-morbid conditions observed were COPD (58%) followed by diabetes mellitus (14%).

Oxidative stress and alterations in responsiveness of inflammatory cells are associated with the physical and chemical properties of tobacco smoke. Tobacco smoking is the most important risk factor for the development of COPD and it is recognized as a risk factor for other respiratory infections. Recent data suggest that patients who have COPD and CAP are morbid and have a high mortality rate than patients who do not have COPD.¹⁰ Increased incidence and mortality of pneumonia in COPD patients is explained due to defective mucociliary clearance, mucous plugging, airway collapse, respiratory muscle fatigue and the effect of medications used.¹¹ Other co-morbidities included Asthma (2%), Congestive heart failure (5%), Chronic Kidney disease (2%), Dementia in (2%).¹² (figure 1)

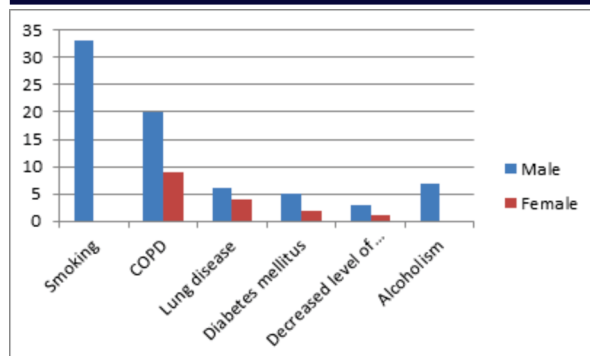


Figure 1: Frequency of risk factors among the subjects

In the study conducted by Madhulatha CK et al in 2013 the most common risk factors identified were smoking (45%) followed by COPD (26%) and diabetes mellitus (8%).¹³

In this study Cough was the predominant symptom (present in 49 patients) . Fever was observed in 37 patients. Tachycardia, pleuritic chest pain and leucocytosis was observed among 34, 30 and 21 patients respectively. 5 patients presented with mental confusion.

In the study by Shah BA et al the maximum number of patients presented with fever (95%), cough (99%), tachycardia (92%), pleuritic chest pain(75%) and sputum production(65%), and leucocytosis (43%). The findings are similar to the results in this study.¹⁴

In this study radiological findings showed 39 patients had lobar pneumonia and 8 had broncho pneumonia. 2 patients had interstitial pneumonia. Right lower lobe infiltration (24)was most common followed by left lower lobe.in 8 and multi lobar involvement in 6 patients.

Out of the 50 samples subjected for sputum culture ,22 samples were culture positive (44%) (table 1).Regasa in a study in Ethiopia in 2014 found a culture positivity of 40 %. Dharmadhikari et al in Pune reported a slightly higher positivity of 63%.¹²

Table 1: Sputum Culture Results

Sputum culture (Aerobic bacterial culture)	Number	Percentage %
Culture Positive	22	44
Culture Negative	28	56
Total	50	100

Gram negative bacteria were the predominant isolates in this study . Klebsiella pneumoniae was the commonest (9 isolates) followed by Pseudomonas aeruginosa (7) and Escherichia coli (2). Streptococcus pneumonia was isolated in 3 patients and Staphylococcus aureus in 1 patient. (table 2)

Table 2 : Profile Of The Isolated Pathogens

Organism	Number	Percentage %
<i>Klebsiella pneumoniae</i>	9	40.90
<i>Pseudomonas aeruginosa</i>	7	31.81
<i>Streptococcus pneumoniae</i>	3	13.63
<i>E. coli</i>	2	9.09
<i>Staphylococcus aureus</i>	1	4.54
Total	22	100

In the Indian scenario, studies on bacteriological etiology are a few , and are confined to limited geographical areas. Etiological agents of CAP are different in different geographical areas. *S. pneumoniae* is the predominant etiological agent of CAP in Shimla and Delhi¹⁵. Mythri et al in Bangalore in the year 2013 reported the most common organism isolated as Klebsiella spp followed by *S.pneumoniae* and *Pseudomonas spp*¹⁶. Indian studies over the last three decades have reported higher incidence of gram negative organisms among culture positive pneumonia^{17,18}.

In this study the gram negative isolates were most sensitive to the aminoglycoside group of drugs. High rate of resistance was observed among *Klebsiella* and *Pseudomonas* isolates to third generation cephalosporins and fluoroquinolones. Streptococcus pneumonia was susceptible to Ampicillin. Ciprofloxacin and erythromycin. The results

were similar to the findings by Chauhan et al in their study in Ahmedabad¹⁹.

The present study revealed that CAP can be caused by different bacteriological agents with preponderance of gram negative over gram positive organisms If the antibiotic according to the sensitivity pattern is administered to these patients at an early stage of the disease, morbidity and mortality due to CAP can be minimized.

The management of elderly persons with CAP is a challenge. Identification of the specific pathogen is necessary for rational and appropriate antibiotic therapy. There is a need to conduct regular prevalence and antibiogram studies to develop empirical guidelines for treatment of CAP in that particular region.

No conflicts of interests.

This study was done under the ICMR Short term studentship program ,2016.

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