



PROSPECTIVE STUDY OF COMMUNITY ACQUIRED PNEUMONIA OF BACTERIAL ETIOLOGY IN ADULTS

Pulmonary Medicine

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ABSTRACT

Prospective Study of Community Acquired Pneumonia of Bacterial Etiology in Adults **Background-** Community acquired pneumonia (CAP) can be described as acute inflammation of lung of infective origin presenting with physical & radiological features compatible with pulmonary consolidation which is acquired outside of hospitals and extended health care facilities.(1) Community-acquired pneumonia (CAP) is the leading cause of mortality and morbidity with substantial clinical and economic impact.(2) The microbial aetiology of CAP is changing, particularly with the widespread introduction of the pneumococcal conjugate vaccine, and there is increased recognition of the role of viral pathogens.(3) Advanced age is associated not only with higher incidence of CAP but also with more severe disease, greater need for hospitalisation and higher mortality. (4) Reports suggest nearly 2.4 million deaths occur among all ages due to lower respiratory tract infections (LRTIs)(2) **Aims:** To determine the outcome of patients hospitalized with CAP

Objectives:

1. To understand the demographic profile of patients hospitalized with CAP
2. To identify the major symptoms and risk factors associated with patients
3. To evaluate the outcome of patients in terms of complications, discharge/ death.

4. Methods: 50 patients who were admitted with CAP in pulmonary medicine wards were evaluated for the study .Detailed history, thorough clinical examination, and relevant biochemical investigations were obtained from all patients **Results And Conclusions:** The incidence of CAP increases gradually with age and is more common among males, with smoking and COPD being risk factors. Productive cough is the most common symptom. Bacteria being causative organisms in most of the cases among which Streptococcus Pneumoniae isolated commonly in sputum. Outcome is good in most of the cases with mortality of 1 %.

KEYWORDS

Bacteriology, sputum cultures, Streptococcus Pneumoniae, Community Acquired Pneumonia, COPD.

INTRODUCTION

Pneumonia is a disease known to mankind from antiquity. Pneumonia is defined as, "An acute inflammation of the pulmonary parenchyma that can be caused by various infective and noninfective origin."⁽⁵⁾

Despite the availability of potent antibiotics, community-acquired pneumonia (CAP) remains common and serious illness with significant morbidity and mortality, both in developing and developed countries⁽⁶⁻⁸⁾

Advanced age is associated not only with higher incidence of CAP but also with more severe disease, greater need for hospitalization and higher mortality.^(9,10)

The aetiology of CAP has been well established, the commonest being Streptococcus pneumoniae and risk factors being increasing age, smoking, and other co- morbidities like Diabetes Mellitus, Chronic Obstructive Pulmonary disease & Chronic Kidney disease.⁽¹¹⁾

This study aims to evaluate the clinical, bacteriological, radiological profile severity and outcome of patients admitted with CAP.

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METHODS

50 patients who were admitted in pulmonary medicine wards in suspicion of CAP were evaluated .Data regarding detailed clinical history including presenting complaints, risk factors, comorbidities, previous hospitalizations, duration of hospital stay , complications and

outcome, general and systemic evaluations were noted, and necessary investigations are collected.

Inclusion Criteria -

- Age > 18 years
- All hospitalized patients with the diagnosis of community acquired pneumonia were included in the study

Exclusion Criteria -

- Age < 18 years
- Patient hospitalised within the last fortnight for reasons other than community acquired pneumonia.
- Patients diagnosed with mycobacterium tuberculosis.

RESULTS

Total of 50 patients data who fulfilled inclusion and exclusion criteria were collected between a period of January - December 2022 .Out of 50 patients 30 were males(60%) and the remaining 20 were females(40%). Out of these 17 smokers(32%) 15 were males and 2 were females. Out of 30 males 17 were smokers .

Table 1: Gender distribution in patients with CAP

SEX	FREQUENCY	PERCENTAGE
MALE	30	60
FEMALE	20	40

In our study age group of 56-65 years had highest presentation (N=14, 28%), followed by 66-75 years (N= 10, 20%), 36-45 years and 46-55 years (N=8,16 %), 26-35 years (N= 5, 10%), 76-85 years (N= 3, 6 %), 18-25 years (N=2,4 %), 86-100(N=1, 2%). (Table 2)

Table 2: Age distribution

AGE	MALES	FEMALES
18-25	1	1
26-35	4	1
36-45	5	3
46-55	5	3
56-65	9	5
66-75	8	2

76-85	2	1
86-100	1	0

The maximum duration of stay for patients hospitalised with CAP was 22 days and minimum was 2 days with mean of 6.66 days of hospital stay.

Out of 50 patients 46 had cough, 39 had fever, 23 had shortness of breath, 11 had chest pain (Table 3). 35 of 46 patients had expectoration whereas 11 patients had dry cough.

Among 50 patients 40 % had no comorbidities, 28% had hypertension and diabetes, 18% had diabetes, 6% had hypertension, 4 % had cerebrovascular accidents, 2 % had coronary artery disease and chronic kidney disease.

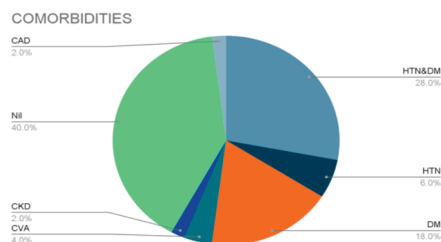


Fig:1 Comorbidities in patients with CAP

Out of 50 patients Lobar pneumonia is most common chest X ray finding (N= 27,54%) ., followed by Bronchopneumonia (N= 10,20%), interstitial pneumonia (N=3, 6%), pleural effusion (N=2, 4%). 6 patients had no findings

Table 3: Pattern of clinical features in patients with CAP

Clinical features	Age <55 years		Age >55 years	
	No of pts	%	No of pts	%
Cough	30	65	16	35
Expectoration	23	65	12	35
Fever	22	75	17	25
SOB	10	43	13	57
Pleuritic Chest pain	3	73	8	27

Out of 50 patients sputum/BAL analysis showed Strep. Pneumoniae in 13 patients (35%), Klebsiella Pneumoniae in 10 (28%), Staph aureus in 7 (18%), H. influenza in 3(7%)patients, Pseudomonas in 2 (6%), and enterococcus in 2 (6%), Acitenobacter in 1(2%)

Table 4: Chest X ray findings in patients with CAP

Radiological finding	No of patients	Percentage
Lobar Pneumonia	27	54
Bronchopneumonia	10	20
Interstitial Pneumonia	3	6
Pleural Effusion	2	4

Table 5: Pattern of microorganism isolation from the patients with CAP

Micro organism	No of patients	Percentage
S. Pneumonia	13	35
K. Pneumonia	10	28
S. aureus	7	18
H. influenza	3	7
Pseudomonas	2	6
Enterococcus	2	6
Acitenobacter baumannii	1	2

Table 6: Complications of CAP

Complications	No of patients	Percentage
Pleural effusion	8	16
Respiratory failure	4	8
No complications	38	76

Among 50 patients 38 patients resolved with no complications, 8 complicated to pleural effusion (16%), 4 to respiratory failure (8%).

Out of 50 patients 87% were cured with no disability, 12% cured with disability, and 1% of deaths were reported

DISCUSSION

This study gives an insight of various factors responsible for CAP and their clinical course and outcome.

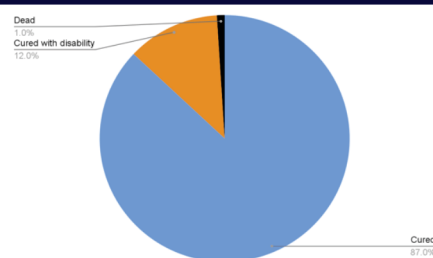


Fig 2: Outcome of patients with CAP

Out of 50 patients 30 were males(60%), 20 were females (40%). Male to female ratio is 3:2. Similarly, in a study conducted by Kollanur et al. 27 were males (57%), and 20 were females (43%). In Jain et al. study 81 were males (67.5%), and 39 were females (32.5%). Male predominance in presentation probably due to smoking history, alcoholism and underlying COPD

In our study 28% belonged to the age group of 56-65. 56% % lie in the age group of >55 years. In a similar study conducted by Jain et. al with mean age group of 68.3% belonging to > 50 years of age. In Kollannur et.al study the mean age group of study was 47.68 years and maximum no of patients admitted between the age group 45-64 (29.8%) .

Increasing incidence of CAP with age may be due to impaired immunity and lung function, dysfunctional nasal mucociliary clearance, lung and heart diseases, and smoking have been identified as independent predictors.

Maximum duration of hospital stay in CAP patients was 22 days and minimum of 2 days. Similar study conducted by Kollannur et al maximum stay was 15 days and minimum was 1 day. Underlying comorbidities and organism isolated predicts the outcome hospital stay and outcome

In our study cough is the most common symptom in 46 out of 50 patients, next common being 37 out of 50 patients. Similar study conducted by Jain et.al. cough is the most common symptom presented (92.5%), fever (90%). Kollanur et al study also showed cough with sputum as the most common symptom (78%) followed by fever (70%). Similar results were found in F. Saldías Peñafiel et. al study.

Chest x-ray finding in our study showed lobar pneumonia as the most common finding (54%) followed by bronchopneumonia (20%).

Similarly in Kollanur et al study lobar pneumonia is the most common chest x ray presentation (64%) followed by bronchopneumonia (36%). Jain et al study lobar pneumonia present in 80% patients followed by bronchopneumonia in 16.7%.

In our study the most common risk factor was smoking. 40 % of patients had no comorbidities followed by 28% with hypertension and diabetes. In a similar study conducted by Jain et al smoking is the most common risk factor 940.8% followed by COPD 35.8 %.

In Kollanur et al study 55% had no comorbidities, followed by 21% had diabetes/hypertension.

Another study conducted by Safiya Richardson et al. Patients with diabetes who required invasive ventilation were at high risk of mortality. Respiratory infections are among the major infections associated with diabetes. Flu and Pneumococcal vaccines are recommended for patients with DM.

Sputum/ BAL microscopy showed Streptococcus pneumoniae as the most common organism isolated 35% followed by Klebsiella Pneumonia 28%. Jain et al study Strep. Pneumoniae is the most common organism isolated (36.4%), followed by Klebsiella Pneumoniae and Staph. Aureus(18.2%).

S. pneumoniae remains the most common detected cause of CAP and our results confirm the data. S. pneumoniae is the most prevalent organism detected in both ICU and non- ICU patients.

Blood cultures were negative in our study of 50 patients. In a study done by S G Campbell et al, out of 286 patients the yield of blood

cultures was 2.1%. In Jain et. al the study rate of organism isolation in blood culture was 9.1% . prior use of antibiotics and improper methods of collection for culture, absence of specific tests to detect viral pathogens could be the reason for low rate of isolation of organisms

In our study mortality was only 1% . Age and septic shock were the independent factors associated with it. Similarly Kollannur et al. study mortality rate was 2% only. In study done by M.I. Costa et al mortality rate was 11.75 owing to bacteremia and positive blood cultures.

CONCLUSION

- CAP is one of the most common cause of hospitalisation with smoking, COPD being risk factors and Streptococcus Pneumoniae frequently isolated presenting as lobar consolidation .
- Initiation of early and appropriate antibiotic therapy decreases the mortality and morbidity .

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