

Original Research Article

Clinical, radiological and bacteriological profile of patients with community acquired pneumonia (CAP)

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Abstract

Background: Community acquired pneumonia (CAP) has been recognized as a common and potentially lethal condition nearly two centuries ago. CAP is a spectrum of diseases ranging from a simple febrile respiratory infection to a severe and fulminating illness leading to death.

Aim: To obtain comprehensive insight into the mode of presentation, clinical, bacteriological and radiological profile of patients with community acquired pneumonia for the early detection of the disease.

Materials and methods: A total 50 patients diagnosed as community acquired pneumonia as defined by MNR Medical College and Hospital were considered and analyzed individual clinical, radiological and microbial status for predetermination of disease.

Results: Dyspnoea was significantly dominant in aged CAP patients ($p < 0.001$) and chest pain was frequent in younger CAP patients ($p = 0.090$). Gram-positive cocci were observed in (70%) and gram-negative bacilli in 26% whereas, mixed cocci were found in 4%. In radiological examination, CAP associated with COPD was constituted 22%.

Conclusion: Identification and determining the etiological and clinical patterns of Community Acquired Pneumonia helps in adoption of regionally optimized diagnostic and therapeutic approach.

Key words

Community acquired pneumonia (CAP), Blood culture, Sputum culture, Radiology.

Introduction

Community acquired pneumonia is an acute illness acquired in the community with symptoms suggestive of LRTI, together with presence of a chest radiograph of intra pulmonary shadowing which is likely to be new and has no clear alternative cause. However, it appears that as many as four million cases of community-acquired pneumonia occur annually and as much as 20% of these require hospitalization [1]. The mortality rate of pneumonia patients in out-patient settings is low, in the range of one to five per cent, but among patients who require admissions to ICU it approaches 25% [2-6].

World health Organization (WHO) global burden of disease study estimated that lower respiratory tract infections (LRTIs), which include CAP, were 429.2 million. It is also estimated death per 100,000 population in 2004 due to LRTI in India was 89.5 [7].

The true incidence of pneumonia acquired in the community is unknown and undoubtedly many pneumonic episodes are treated by primary care physicians as “lower respiratory tract infection or bronchiolitis” without recourse to chest radiographs [8-11]. In recent years, both the epidemiology and treatment of pneumonia have undergone changes. Pneumonia is increasingly common among older patients and those with comorbidity like COPD, DM, renal failure, congestive heart failure, CLD and other conditions [12].

This study is directed at understanding the mode of presentation, clinical features, bacteriological and radiological features for the early detection of community acquired pneumonia.

Materials and methods

This study included a total 50 patients diagnosed with community acquired pneumonia and was

conducted in Department of General Medicine, MNR Medical College and Hospital, Sangareddy during October 2012 to September 2015. Consent was obtained from all the subjects and ethical clearance was obtained from MNR Medical College Ethical Committee.

Inclusion criteria

All adult patients of both genders, who were recently diagnosed as Community Acquired Pneumonia (CAP) aged above 14 years.

Selection criteria of patient

- Patient presented with acute onset of fever associated chills and rigors
- Patient having cough with expectoration and
- Chest pain and breathlessness

All the patients were subjected for detailed clinical examination to make a provisional diagnosis of Community Acquired Pneumonia (CAP).

- Sputum examination for Gram stain, AFB, and Culture were done
- Blood tests for WBC Count and Differential Count were done
- Chest X-ray done to know the Site of consolidation
- Elisa was done to rule out HIV infection

Exclusion criteria

- Patients with Hospital Acquired Pneumonia, aspiration pneumonia and PCP pneumonia in patients with HIV were excluded.
- All patients were hospitalized and one full course of antibiotic treatment according to sensitivity was given.

Data analysis

All the data was tabulated in Microsoft excel sheet and analyzed by SPSS statistical software. Chi-square and Fisher exact test have been used to identify the significance of various parameters

between younger and elder age group CAP patients. Odds Ratio (OR) had been used to find the strength of relationship of clinical, radiological and bacteriological presentation.

Results

A prospective clinical study consisting of 50 Community Acquired Pneumonia (CAP) patients was undertaken to investigate the magnitude and pattern of clinical, radiological and bacteriological presentation. The study group consisted of 50 patients, among whom 43 (86%) were males and 7 (14%) were females. Among 50 patients, 48% were elderly > 50 years.

Almost all the patients had fever, cough with expectoration (100%), majority had chest pain (66%) and dyspnea in 50%. Dyspnea was significantly more common in elderly CAP patients (21.0 times more with $p < 0.001$) and chest pain was more common in younger CAP patients (2.82 times more with $p = 0.090$). Hypertension, DM and PTB were not risk factors for CAP. The CAP was significantly more common in patients with COPD ($p < 0.001$) (Table - 1). Clubbing was significantly more common in CAP patients with $p > 0.001$ (Table - 2).

Table – 1: Presentation of risk factors in CAP patients.

Risk factors	Age <50 Years (n=26)		Age >50 Years (n=24)		Total (n=50)
	Number	%	Number	%	Number
Hypertension	-	-	-	-	-
DM	1	3.8	1	4.1	2
PTB	-	-	-	-	-
COPD	1	3.8	10	41.7	11

Table – 2: Presentation of GPE in CAP patients.

GPE	Age <50 Years (n=26)		Age >50 Years (n=24)		Total (n=50)
	Number	%	Number	%	Number
Pallor	1	3.8	2	8.3	3
Icterus	-	-	-	-	-
Clubbing	1	3.8	10	41.7	11
Cyanosis	-	-	-	-	-
Lymphadenopathy	-	-	-	-	-
Edema	-	-	-	-	-

Among general physical examination, clubbing was more common (22%) with $p < 0.001$ and pallor in 3 patients (6%). On systemic examination, there were signs of consolidation in all among the study group, except in about 68% who had adventitious sounds like crackles etc.

Sputum for AFB was negative, gram-positive cocci were more common (70%) and gram-negative bacilli was about 26%. Mixed were accounted for about 4%. Sputum culture report showed Streptococcal pneumonia as more

common constituted about 46%, Staphylococcus aureus about 24%, Pseudomonas 4%, Klebsiella accounted about 14%, E. Coli 8%, mixed bacteria constituted 4% in this study (Table – 3).

CAP associated with COPD constituted 22%. Right lower lobe consolidation was more common constituting about 26% of the cases. Right middle lobe involvement was 18%, right upper lobe was seen in 3 cases (6%), right middle and lower lobe in 5 patients (10%), right Para cardiac (6%), left lower lobe in 8 patients

(16%), left upper and lower lobe in 7 patients (14%), bilateral in 2 patients (4%). No involvement of left upper lobe (**Figure – 1, 2, 3**).

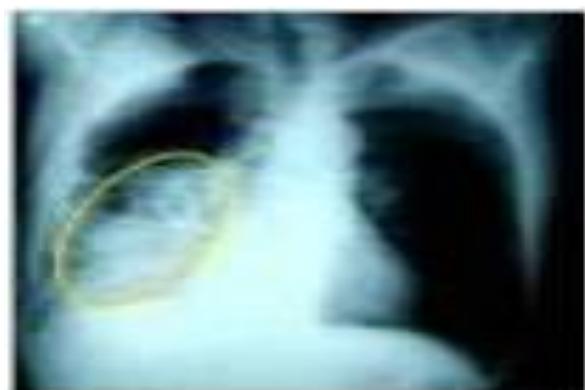
Table – 3: Sputum culture report.

Sputum culture- organisms grown	No.	%
Streptococcus pneumonia	23	46
Staphylococcus aureus	12	24
Klebsiella	7	14
Pseudomonas	2	4
NC E. coli	4	8
Mixed bacteria	2	4

Figure – 1: Chest X-ray showing right upper lobe pneumonia (6% patients).



Figure – 2: Chest x-rays showing right middle and lower lobe pneumonia (10%) patients.

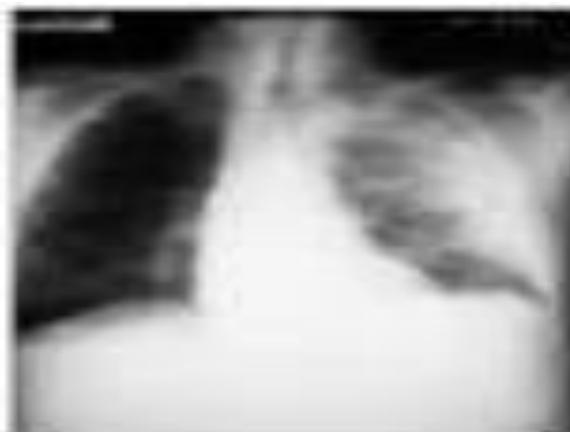


Discussion

In the present study, 50 patients admitted to MNR Medical College Hospital with an admitting diagnosis of Community Acquired

Pneumonia prospectively evaluated. All the cases selected met the inclusion and exclusion criteria.

Figure – 3: Chest X-ray showing left upper and lower lobe pneumonia (14%) patients.



In the present study, 58% are elderly comprised of the total cases, considered between the study age group of 14 -80 years. A study of Dey, et al. they have found out that among the study patients affected, those aged > 50 years are more as compared to less than 50 years age. This study is on par with their study [13].

In the present study we found out that Gram +ve organisms are more common (70%) compared to Gram-negative organisms (26%) and mixed 4%. This result is on par with the previous study done by Larry G. Reimer [14]. In India also the etiological agent of CAP varies with geographical distribution e.g. *Streptococcus pneumoniae* predominates as etiological agent of CAP in Shimla [15] and Delhi [16] whereas *Pseudomonas aeruginosa* pre-dominates as an etiological agent in blood culture positive CAP in Ludhiana [17].

In the present study, it was found that streptococcal pneumoniae being more common pathogen in CAP accounting for 46%. Next common was staphylococcus aureus, which accounted for 24%. Pseudomonas and other constituted about 16%. This observation is similar to that of study done by Larry G. Reimer others and in the study of Sanraj K. Basi

streptococcal was about 73% and Staph 32% [14, 18]. Fibresima FP, et al. (2008) study showed that Streptococcus pneumonia and Klebsiella were common etiological organisms of CAP in Port Harcourt [19]. Dr. Jayant B. Chauhan, et al. (2014) shows that Streptococcus pneumonia is still the most common cause of community acquired pneumonia (22%). Next common cause in their study was Gram-negative bacilli (22%) and Staphylococcus aureus (12%). Among Gram-negative bacilli Klebsiella and E-coli were common (8% each) [20].

Conclusion

The incidence of CAP is influenced by the geographic region, patients' age, and presence of the predisposing factors. The most common admission age group for CAP was between ages of 40 to 60 years, comprising 56% of the study patients. Males were affected more than females (8.6: 1.4). Most frequent presenting features were acute onset of fever (100%), with cough and expectoration (100%). Most frequent predisposing factor for CAP in males is COPD (22%). Most frequent pathogen isolated in CAP is Streptococcus pneumoniae (46%). Most frequent infectious preponderance was found in right lung.

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