

## Original Research Article

# Epidemiology and clinical features of community acquired pneumonia: hospital based study

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## ABSTRACT

**Background:** Community acquired pneumonia (CAP) is an infection affecting a significant proportion of population from all age groups across the globe with considerable morbidity and mortality. There is a need for data from various parts of India to better understand the epidemiology of CAP. Present study is an attempt to present the relevant data from a tertiary care hospital in Rajkot, Gujarat during the study period.

**Methods:** This observational prospective descriptive study was done during November 2014 to April 2016 at Department of TB and chest diseases, PDU Hospital at Rajkot in Gujarat. 50 patients with clinical features suggestive of CAP were enrolled. Male and female patients (above age of 12 years) admitted to TB and Chest ward or patients on OPD basis were selected for the study. The diagnosis of CAP was mainly clinical with some assistance from radiological picture. All patients were thoroughly examined particularly with regards to detailed history, clinical examination, predisposing factors and associated co-morbid conditions. Sputum examination-gram stain and culture sensitivity was done in all patients, where sputum was available. Sputum examination for acid fast bacilli (AFB) by Ziehl Nelson staining technique was done. Age and sex distribution of patients, microorganisms isolated and the clinical features were described and analyzed.

**Results:** The mean age was  $38.38 \pm 17.41$  (SD) years. Male patients were 34 (68%) and female patients were 16 (32%). Male to female ratio was 2.1:1. In this study, 47 (94%) patients were admitted in the hospital for the management and 3 (6%) patients were treated on the OPD basis. Fever and cough were most common symptoms whereas dull note on affected side and crepitations were the commonest signs elicited. In this study, the most common predisposing factor was smoking which accounted for 20 (40%) patients. The most common lobe involved was Left Lower lobe accounting for 20 (40%) patients and least common lobe involved was left upper lobe accounting for 2 (4%) patients. *Streptococcus pneumoniae* was the most common organism isolated in 8 (16%) patients and second common organism was *Klebsiella* isolated in 7 (14%) patients.

**Conclusions:** Males, especially smokers were more commonly affected and *Streptococcus pneumoniae* was the most common organism isolated. The study gives the hospital based data from the region regarding epidemiology and clinical features of community acquired pneumonia.

**Keywords:** *Klebsiella*, *Streptococcus pneumoniae*, Smoking

## INTRODUCTION

Community acquired Pneumonia (CAP) is an infection affecting a significant proportion of population from all

age groups across the globe with considerable morbidity and mortality. In the Indian context, there is a lack of related literature with few studies available from different geographical regions and not much national data reported

with respect to epidemiology like causative agent, clinical presentation and influencing factors. The varied prevalence of causative organism across different geographical regions in India has been reported.<sup>1-4</sup> *Streptococcus pneumoniae* was reported to be the commonest organism isolated from sputum of patients with community acquired pneumonia in a study from the national capital, Delhi as well as from the capital of Odisha state i.e. Bhubaneswar.<sup>5-6</sup> *Streptococcus pneumoniae* was also the most frequent organism isolated from sputum of patients in a study from Gwalior in Madhya Pradesh and Shimla in Himachal Pradesh.<sup>7-8</sup> whereas *Klebsiella pneumoniae* or *Pseudomonas* was the common causative organism reported to be isolated from sputum of patients with community acquired pneumonia from a few regions like Mangalore, Karnataka and Kashmir.<sup>9-10</sup> So, there is variability in the epidemiological factors like causative organism and also the clinical presentation may vary across different geographical regions. Thus, there is a need for data from various parts of India to better understand the epidemiology of Community acquired pneumonia. Present study is an attempt to present the relevant data from a tertiary care hospital in Rajkot, Gujarat during the study period.

## METHODS

This observational prospective descriptive study was done during November 2014 to April 2016 at Department of TB and Chest Diseases, PDU Hospital at Rajkot in Gujarat. 50 patients with clinical features suggestive of CAP were enrolled.

### Inclusion criteria

- Male and female patients (above age of 12 years) admitted to TB and CHEST ward or patients on OPD basis were selected for the study.
- The diagnosis of CAP was mainly clinical with some assistance from radiological picture.

### Exclusion criteria

- Patient of less than 12 year of age,
- Any patient who had a positive history of hospitalization within last 2 weeks for causes other than CAP was excluded from study.

All patients were thoroughly examined particularly with regards to detailed history, clinical examination, predisposing factors and associated co-morbid conditions. Examination of oral cavity and upper respiratory system was done in every patient. Gag reflex was checked in some suspected cases of aspiration pneumonia. SPO2 measurement was done in all patients to assess severity of pneumonia. In suspected cases of severe pneumonia with septicaemia, Blood culture and DST was also sought. Electrocardiogram and chest radiographs (PA view) were obtained for all patients. Sputum examination-gram stain and culture sensitivity was done in all patients, where

sputum was available, before administering any antibiotic treatment unless the clinical condition warranted prompt empirical antibiotic therapy. Sputum examination for acid fast bacilli (AFB) by Ziehl Nelson staining technique was done. Sputum for cytology in suspected cases of lung malignancy was examined. Age and sex distribution of patients, microorganisms isolated, and the clinical features were described and analysed.

## RESULTS

The age of youngest patient was 13 years and age of the oldest patient was 87 years. The mean age was 38.38±17.41 (SD) years (Table 1).

**Table 1: Incidence of CAP in relation to age.**

Age group (years)	Number of Patients	Percentage (%)
12-20	07	14%
21-30	13	26%
31-40	12	24%
41-50	04	08%
51-60	09	18%
>60	05	10%
Total	50	100%

**Table 2: Clinical manifestations (major symptoms and signs).**

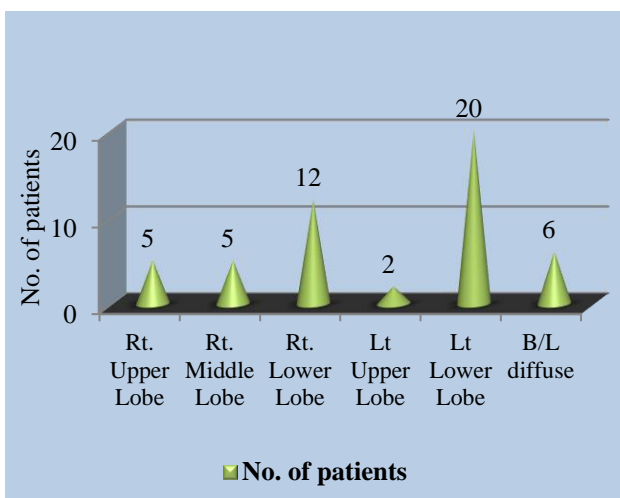
Symptoms	Number of patients	%
Cough	46	92%
Expectoration	40	80%
Haemoptysis	9	18%
Fever	50	100%
Pleuritic chest pain	33	66%
Dyspnoea	24	48%
Constitutional symptoms	34	68%
<b>Clinical manifestation (count)</b>	<b>Number of patients</b>	<b>%</b>
<b>Respiratory system</b>		
Tachypnoea (i.e. R.R. >25/min)	29	58%
Dull note at affected site	44	88%
Crepitations	32	64%
Bronchial Breath sounds	15	30%
<b>CVS system</b>		
Tachycardia (pulse rate >100/min)	30	60%
Hypotension/shock	3	6%
<b>GIT system</b>		
Organomegaly	2	4%
<b>CNS system</b>		
Altered sensorium	3	6%

Total number of male patients was 34 (68%) and total number of female patients was 16 (32%). Male to female

ratio was 2.1:1. In this study, 47 (94%) patients were admitted in the hospital for the management and 3 (6%) patients were treated on the OPD basis. Tables 2 (A and B) reflect the clinical features. In this study, the most common predisposing factor is smoking which accounted for 20 (40%) patients (Table 3).

**Table 3: Incidence of predisposing factors.**

Predisposing Factor	Number of patients	(%)
H/o smoking	20	40%
Previous history of URTI (within 3 months)	6	12%
H/O alcoholism	7	14%
H/O tuberculosis (past/present)	5	10%
H/O medical conditions like DM, HT, IHD, Asthma.	6	12%
Immunodeficiency states- HIV, Drugs, Malignancy congenital like primary hypogamaglobulinemia	8	16%



**Figure 1: Lobar distribution of consolidation.**

**Table 4: Microbial agents isolated.**

Agent	Number of patients	(%)
<i>Strep. Pneumoniae</i>	8	16%
<i>Staphylococcus</i> (as polymicrobial flora)	5	10%
<i>Klebsiella</i>	7	14%
<i>H. Influenza</i>	1	2%
<i>Pseudomonas</i>	2	4%
Inconclusive report (includes factors like Fastidious organism, atypical microbes, virus, fungi etc.)	27	54%

In present study, the most common lobe involved was left lower lobe accounting for 20 (40%) patients and least common lobe involved was left upper lobe accounting for

2 (4%) patients (Figure 1). In this study, *streptococcus pneumoniae* was the most common organism isolated in 8 (16%) patients and second common organism was *Klebsiella* isolated in 7 (14%) patients (Table 4).

**DISCUSSION**

In our studied patients, total number of male patients was 34 (68%) and total number of female patients was 16 (32%). Male to Female ratio was 2.1:1. Similarly, Shah BA et al, studied 100 patients from Kashmir and found male preponderance with elderly patients more commonly affected.<sup>10</sup> Male preponderance has also been reported in a study from Mangalore by Prasad and Bhat.<sup>9</sup> Capoor et al, study from Delhi also reported a very high proportion of males among their study population of CAP.<sup>5</sup> A very high percentage of males were also reported by Mishra and Behera study from Bhubaneswar, Odisha.<sup>6</sup> Fever and cough were most common symptoms whereas dull note on affected side and crepitations were the commonest signs elicited in our study. The most common predisposing factor was smoking which accounted for 20 (40%) patients. The most common lobe involved was left lower lobe accounting for 20 (40%) patients and least common lobe involved was left upper lobe accounting for 2 (4%) patients. Similar observations have been reported by Jain SK et al, study from Gwalior in Madhya Pradesh. They also observed male preponderance and suggested that it may be attributed to smoking and other predisposing factors like alcohol intake and chronic obstructive pulmonary disease being more common among males. Both side lower lobes of lungs were affected in majority of their study population. Fever and cough were commonest symptoms observed in their study.<sup>7</sup> Shah BA et al, also reported cough and fever as commonest symptoms and smoking as most common predisposing factor.<sup>10</sup>

Also, fever and cough were commonest symptoms observed in Mishra and Behera et al study.<sup>6</sup> In this study, *streptococcus pneumoniae* was the most common organism isolated in 8 (16%) patients and second common organism was *Klebsiella* isolated in 7 (14%) patients. *Streptococcus pneumoniae* has been found to be the most common causative agent of CAP in Delhi, Bhubaneswar in Odisha, Gwalior in Madhya Pradesh and Shimla in Himachal Pradesh whereas *Klebsiella pneumoniae* was the most common causative organism reported in Mangalore, Karnataka and *Pseudomonas* was the common causative organism reported in Kashmir.<sup>5-10</sup> Bacterial isolation and identification from sputum was seen in 23 patients, i.e. 46%. Khadanga S et al, study from eastern India reported isolation rate from sputum as 29% and *Streptococcus pneumoniae* was the commonest organism found followed by *Pseudomonas* and *Klebsiella*.<sup>11</sup>

Limitations of our study like small and hospital based sample make it difficult to extrapolate the findings to general population from region. Further studies are

needed with community based and large diverse sample to better understand the epidemiology and clinical presentation of community acquired pneumonia in the region.

## CONCLUSION

Males, especially smokers were more commonly affected and *Streptococcus pneumoniae* was the most common organism isolated. The study gives the hospital based data from the region regarding epidemiology and clinical features of community acquired pneumonia.

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