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Original Research Article

Clinical study of community acquired pneumonia at MNR medical college and hospital, Sangareddy

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ABSTRACT

Background: This study is done to study the clinical profile of community acquired pneumonia in patients admitted in medical wards at MNR Hospital, Sangareddy and to find out the associated risk factors of community acquired pneumonia.
Methods: 75 Patients admitted in the department of medicine of MNR Medical college and Hospital, Sangareddy with clinical manifestations of Community acquired pneumonia from august 2012 to January 2015 (Two years and 6 months) were taken into the study. All adult patients of both genders aged above 14 yrs, who presented with acute onset of fever associated with chills and rigors, having cough with expectoration and/ or chest pain and breathlessness were included in the study. All the patients were subjected for detailed clinical examination to make a provisional diagnosis of community acquired pneumonia (CAP). Patients with hospital acquired pneumonia, aspiration pneumonia and PCP pneumonia in patients with HIV were excluded.
Results: Among 75 cases studied, the mean patient age was 52.1 years with Male: Female patient ratio 3.17:1. The associated diseases in this study are COPD (30.67%) and DM (12.0%).The most common presenting symptoms were fever (100%), cough (100%), and expectoration (100%); other symptoms included chest pain (60%), dyspnoea (61.33%). The respiratory signs included bronchial breath sounds, increased VF and VR, and presence of whispering pectorolique in all subjects.
Conclusions: Identification and determining the clinical patterns of community acquired pneumonia helps in adoption of regionally optimized diagnostic approach.

Keywords: Community acquired pneumonia, Chronic obstructive pulmonary disease, Dyspnoea

INTRODUCTION

Community acquired pneumonia (CAP) 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.[1,2]

Pneumonia is one of the leading causes of morbidity and mortality, both in developing and developed countries and is the commonest cause (10%) of hospitalizations in adults and children.[1,3]

World Health Organization (WHO) global burden of disease study estimated that lower respiratory tract infections (LRTIs), which include CAP, were 429.2 million episodes of illness worldwide and accounts for 94.5 million disability adjusted life years (DALY's). In adults aged over 59 yrs, it causes 1.6 million deaths annually. Estimated death per 100,000 populations in 2004 due to LRTI in India was 89.5, while it was 62.0 in

the United Kingdom (UK) and 21.3 in United States of America (USA).[4]

Epidemiology

Overall in adults CAP occurs in 2 to 12 per 1000 of adult population per year.The incidence is higher below the age of 5years and rises from the age of 50 upwards. About 80% of cases are managed in the community, where mortality rate is 1-2%. There is seasonal variation in the frequency of CAP, more common in the winter.[1,5,6]

Mode of transmission[1]

Pathogens may enter the lung by the aspiration of organisms that colonize the oropharynx, inhalation of infectious aerosols, haematogenous dissemination from an extra pulmonary site or direct inoculation and contiguous (adjoining) spread.

Pathology[1]

The pneumonic process may involve primarily the interstitium or alveoli. The involvement of an entire lobe is called-lobar pneumonia. When the process is restricted to alveoli adjoining to bronchi is called-bronchopneumonia. Cavities develop when necrotized lung tissue is discharged into communicating airways.

Pathogenesis

Pathogenesis of pneumonia due to various microorganisms is more or less same, but few differences or changes can be seen either in pathology or in subsequent complication.[7]

Pathological staging[1]

- Stage of congestion - fine crackles are heard
- Stage of red hepatisation - tubular bronchial breathing is heard
- Stage of grey-hepatisation - tubular bronchial breathing is heard
- Stage of resolution -coarse crackles are heard

Pneumonia is predisposed by any condition that reduces or suppresses the cough, impairs mucociliary activity, reduces the effective phagocytic activity of alveolar macrophages and neutrophils and impairs immunoglobulin production.

Clinical manifestations[1-3,8]

CAP traditionally presents in two forms: typical and atypical

1. The typical pneumonia syndrome is characterized by sudden onset of fever with or without chills, cough productive of purulent sputum, shortness of breath, pleuritic chest pain, haemoptysis and signs of pulmonary consolidation-(dullness, increased VF/VR, egophony, bronchial breath sounds and rales) found on physical examination and chest x-ray.

   Most common pathogen in CAP is Strep. Pneumonia but can also be due to H. influenza and mixed anaerobic and aerobic components of oral flora.

2. The atypical pneumonia is characterized by gradual onset of fever, dry cough, shortness of breath, a prominence of extra pulmonary symptoms (headache, myalgia, fatigue, sore throat, nausea, vomiting and diarrhoea) with minimal signs on chest x-ray.

   Atypical pneumonia is classically produced by Mycoplasma pneumoniae, can also be caused by Legionella pneumoniae, Chlamydia pneumoniae, oral anaerobes, and Pneumocystis carinii and less frequently encountered pathogens Ch.psittaci, CoxiellaBurnettii, Francisella Tularensis, H.capsulatum, Coccidiodesimmitis, and certain viruses also produce atypical pneumonia.

Non-respiratory symptoms of CAP includes[1-3,8]

Lower lobe pneumonia may present with abdominal pain, rigidity, ileus, marked confusion seen in patients with severe pneumonia, may present with signs of meningitis, cerebellar dysfunction, signs of hypoxia and metabolic disturbances.

This study is directed at understanding the mode of presentation, clinical features for the early detection of disease, and to study its complications.

Aims and objectives of the study

Aim of the study

- To assess the magnitude (proportion of CAP).
- To study the modes of presentation.
- To study the risk factors and their outcome.

Objective of the study

The present study is undertaken to study the mode of presentation, its clinical features for the early detection of the disease.

METHODS

Source of data

The patients diagnosed as CAP and admitted in MNR Medical College and Hospital, Sangareddy.

Method of collection of data

During the study period from August 2012 to January 2015, patients who were diagnosed as CAP were selected.

Sample size

75 In-Patients

Selection criteria

Inclusion criteria

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

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 CAP.

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.

Ethical clearance was obtained from MNR Medical College Ethical Committee.

Statistical software

Chi-square and Fisher exact test have been used to test the significance of percentage of various parameters between younger and elder age group CAP patients. Odds Ratio (OR) has been used to find the strength of relationship of clinical presentation.

The Statistical software namely SPSS 11.0 and Systat 8.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

$p>0.05$ No significance
$0.05 <p<0.10$ Trend but NS
$0.01<p<0.05$ Significant
$p<0.01$ highly significant.

RESULTS

Study design

A prospective clinical study consisting of 75 CAP patients, is undertaken to investigate the magnitude and pattern of clinical presentation.

Table 1: Presentation of CAP with age and sex.

Age in years	Female		Male		Total	
	No.	%	No.	%	No.	%
≤ 20	-	-	1	1.75	1	1.13
21-30	1	5.56	4	7.1	5	6.67
31-40	3	16.67	6	10.52	9	12
41-50	3	16.67	10	17.54	13	17.3
51-60	5	27.78	25	43.85	30	40
61-70	5	27.78	9	15.78	14	18.67
>70	1	5.56	2	3.5	3	4.0
Total	18	24.0	57	76.0	75	100.0
Mean ± SD	42.00±10.80		46.86±13.96		43.80 ± 12.78	
Inference	76% of CAP patients are males and 62.67% are elderly (>50 years).					

Table 2: Presentation of clinical features in CAP patients.

Clinical features	Age ≤ 50 years (n=28)		Age >50 year (n=47)		Total (n=75)
	No	%	No	%	No
Fever	28	100.0	47	100.0	75
Cough	28	100.0	47	100.0	75
Expectoration	28	100.0	47	100.0	75
Dyspnoea	6	21.42	40	85.1	46
Chest pain	22	78.57	23	48.93	45
Inference	Dyspnoea is significantly more common in elderly CAP patients (with $p<0.001$) and chest pain is more common in younger CAP patients (with $p>0.05$).				

Table 3: Presentation of risk factors in CAP patients.

Risk factors	Age ≤50 years (n=28)		Age >50 year (n=47)		Total (n=75)
	No.	%	No.	%	No.
Hypertension	2	7.14	5	10.63	7
DM	3	10.71	6	12.76	9
PTB	-	-	-	-	-
COPD	3	10.71	20	42.5	23
Inference	CAP is significantly more common in patients with COPD (p<0.001).				

Table 4: Presentation of GPE in CAP patients.

GPE	Age ≤50 years (n=28)		Age >50 year (n=47)		Total (n=75)
	No.	%	No.	%	No.
Pallor	1	3.5	4	8.51	5
Icterus	-	-	-	-	-
Clubbing	1	3.5	20	42.55	21
Cyanosis	-	-	-	-	-
Lymphadenopathy	-	-	-	-	-
Edema	-	-	-	-	-
Inference	Clubbing is significantly more common in CAP patients with p<0.001.				

The study group consisted of 75 patients, among whom 57 (76%) were males and 18 (24%) were females. Among 75 patients, 62.67% were elderly >50 years (Table 1).

Almost all the patients had fever, cough with expectoration (100%), majority had chest pain (60%) and dyspnoea in 61.33%. Dyspnoea is significantly more common in elderly CAP patients (with p<0.001) and chest pain is more common in younger CAP patients (with p>0.05) (Table 2).

The CAP is significantly more common in patients (>50 yrs of age) with COPD (p<0.001) (Table 3).

Among general physical examination, clubbing is more common (28%) with p<0.001 and pallor in 5 patients (6.67%) (Table 4).

Table 5: Systemic examination findings.

Signs +ve	No of pts.	%
VF	75	100
BBS	75	100
VR	75	100
WP	75	100
ADVENT. SOUNDS	51	68

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 (Table 5).

DISCUSSION

CAP is a common and major medical problem in tropical countries especially in developing and undeveloped countries, and more so in India with dense population and limited health resources.

In the present study, 75 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.

There have been numerous research studies done in various parts of the world focussing on diverse aspects of community acquired pneumonia highlighting its importance among treatable health care diseases. Salient features among those important studies done on community acquired pneumonia were studied and examined, for any significant contrasting evidence in comparison to the present subjective population, and the relevant findings among those are listed below, and a comparative study has been discussed.

Age

In the present study, 62.67% are elderly comprised of the total cases, considered between the study age group of 14 - 80 years.

It is well documented that pneumonia is a commonly occurring disease in the community and its incidence progressively rises sharply at extremes of age.

In the present study group, patients below 14 years were not included; the majority of patients were of middle age and elderly. In the 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 (Table 6).[9]

Table 6: Comparison of the present study with the Dey et al study in relation to age group.

Age group	Dey et al.[9] (%)	Present study (%)
>50 years	59%	62.67
<50 years	40%	37.33

Sex incidence

In this study of 75 patients it was observed that majority of patients are males (76%) in comparison to the female population which was 24% (Table 7).

Table 7: Comparison of the present study with the Joshua et al study in relation to sex predilection.

Sex	Joshua et al.[10] (%)	Present study (%)
Male	80%	76
Female	20%	14

This could be attributed to the well-established fact that risk factors like cigarette smoking and alcoholism, as well as underlying lung disease e.g. COPD predisposes to pneumonia and is more common among male population in India.[10] In this study group majority of male patients are exposed to one or more of the above-mentioned predisposing factors.

Predisposing factors

Structural lung diseases and associated chronic diseases e.g. Diabetes altering the local lung defence mechanisms and systemic defence mechanisms, predisposing to frequent acute lung infection has been well-documented.

In this study, 30.67% had COPD, 12% had diabetes.

Table 8: Comparison of the present study with Abdullah et al study in relation to predisposing factors.

Predisposing factors	Abdullah et al[12] (%)	Present study (%)
COPD	48%	30.67
DM	24%	12

The COPD patients had altered cellular and structural abnormalities in the lung. The change in the bacterial flora in these patients is well supported by ineffective coughing mechanism and advanced age related structural changes predispose them to pneumonia (Table 8).[1,11,12]

Presenting complaints

In this study among all of the presenting symptoms fever**,** cough with expectoration was commonest (100%), chest pain (66%), and dyspnoea (50%) were the other usual chief symptoms.

In Mac Farlane study of aetiology and outcome of CAP, cough was the most frequent symptom. The other symptoms were fever 86%, chest pain 62% and haemoptysis 15% (Table 9).[9]

General physical examination

In this study, clubbing is significantly more common 28%, and conjunctival pallor was observed in 5 patients (6.67%) (Table 10).

Table 9: Comparison of the present study with the Mac Farlane study, Metlay and Fine study in relation to patient symptoms.

Symptoms	MacFarlane study[13](%)	Metlay and Fine[10] (%)	Present study (%)
Fever	86	88	100.0
Cough	92	92	100.0
Expectoration	54	65	100.0
Dyspnoea	67	71	61.33
Chest pain	62	-	60.0

Table 10: Comparison of the present study with the Abdullah et al study in relation to general physical examination.[12]

General physical examination	Abdullah et al study[12](%)	Present study (%)
Pallor	26	6.67
Icterus	12	-
Cyanosis	8	-
Clubbing	4	28
Pedal edema	8%	-

Vital signs

In this study, examination of vital data reveals that 86% had tachypnea 52% had tachycardia and 88% had high-grade temperature associated with chills and rigors.

The above mentioned vital signs, tachycardia, tachypnea and high-grade fever with chills and rigors, are well known to occur frequently in patients with acute pulmonary infections (Table 11).

Table 11: Comparison of the present study with the Abdullah et al and Kobashi et al study in relation to vital signs.

Vital signs	Abdullah et al study[12](%)	Kobashi et al study[14](%)	Present study (%)
Temp. >38^0 C	68	56	88
Tachypnea	84	70	86
Tachycardia	70	69	52

Systemic examination

In this study the examination of respiratory system revealed various features of pneumonia. Bronchial breath sounds, increased VF and VR and whispering pectorolique was seen in all 50 patients. Inspiratory crackles were seen in 68% of patients.

Among the physical signs documented in cases of pneumonia; BB Sounds were the commonest focal sign of CAP. Inspiratory crackles were also heard in majority of cases (Table 12).

Table 12: Comparison of the present study with Spiteri et al study in relation to clinical signs.[15]

Signs	Spiteri et al[15] (%)	Present study (%)
BBS	72	100
VF	85	100
VR	855	100
WP	85	100
AD.SOUNDS	72	68

Prognosis

In this study, the prognosis was good. Most of the patients recovered without any complications except in patients with COPD and DM wherein symptoms were not completely reduced and were advised for follow-up.

CONCLUSION

Although most patients are admitted to MNR Hospital for conditions other than community acquired pneumonia, CAP is among the leading causes requiring in-patient management.

The incidence of CAP is influenced by the geographic region, patient' sage, and presence of the predisposing factors.

In this study, it was found that:

1. The most common admission age group for CAP was between ages of 40 to 60 years, comprising 57.33% of the study patients.
2. Males were affected more than females (3.17: 1.0).
3. Most frequent presenting features were acute onset of fever (100%), with cough and expectoration (100%).
4. Most frequent predisposing factor for CAP in males is COPD (30.67%).

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