STUDY OF CLINICAL PROFILE AND RISK FACTORS OF PNEUMONIA (CAP)G. Vasavi Latha¹, N. Ravi Kumar², P. Suresh Kumar³¹Associate Professor, Department of General Medicine, Andhra Medical College, Visakhapatnam.²Senior Resident, Department of General Medicine, Andhra Medical College, Visakhapatnam.³Junior Resident, Department of General Medicine, Andhra Medical College, Visakhapatnam.**ABSTRACT****BACKGROUND**

Community-acquired pneumonia (CAP), the most common type of pneumonia is one of the commonest infectious diseases and is an important cause of mortality and morbidity in all age groups worldwide. Identifying people at risk for this infection aids in appropriate treatment. Hence, there is a need for a study to know the clinical profile and risk factors of pneumonia (CAP).

Aim- To study the clinical profile and risk factors of pneumonia (CAP).

MATERIALS AND METHODS

50 patients who were admitted with pneumonia over a period of 7 months from 1st January 2017 to 31st July 2017 in King George Hospital, Visakhapatnam were studied retrospectively.

RESULTS

In this study, majority of cases are males contributing 60%. CAP is commonly seen in the age group of 51-60 years (26%). The study shows that in young patients (age up to 50 years) cough with expectoration (34%) was the most common clinical feature followed by fever (32%) and breathlessness (22%), and among old patients (age above 50 years) fever (58%) was the most common clinical feature followed by cough with expectoration (40%) and breathlessness (22%). Pedal oedema, altered sensorium were present each as 4% but the former was seen in younger group and later was in older group. Among male patients smoking (56%) was the most common risk factor followed by alcohol (40%) and among female patients preceding diabetes (13%) was the most common risk factor. In the present study, the radiological finding (consolidation) was more common on right side constituting about 56% of the cases followed by left side (28%) and bilateral involvement in 16% cases. Right lower lobe involvement is more common in this study. Complications (20%) were more common in males and above 50 years.

CONCLUSION

World Health Organization's (WHO) global burden of disease study estimated that lower respiratory tract infections (LRTIs), which include CAP, were 429.2 million. Commonly affected age group is 51-60 years which is the golden period in one's life. Patients, particularly elderly and debilitated having risk factors, should be instructed to seek prompt medical care during the early stages of dyspnoea or fever to prevent complications. Modifiable risk factors should be strictly corrected especially in those who also have fixed risk factors. Identification and determining the clinical patterns and risk factors of Pneumonia (CAP) helps in adoption of regionally optimised diagnostic and therapeutic approach.

KEYWORDS

Pneumonia (CAP), Clinical Features, Risk Factors, Prevention of Complications.

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BACKGROUND

World Health Organization's (WHO) global burden of disease study estimated that lower respiratory tract infections (LRTIs), which include CAP, were 429.2 million. It is also estimated deaths per 100,000 population in 2004 due to LRTI in India was 89.5.¹ Community-acquired pneumonia (CAP) refers to pneumonia acquired outside of hospitals or extended-care facilities. CAP, the most common type of pneumonia is a spectrum of diseases ranging from a simple febrile respiratory infection to a severe and fulminating

illness leading to death. Its causes include bacteria, viruses, fungi and parasites.² CAP is diagnosed by assessing symptoms, making a physical examination and on x-ray findings. Worldwide a number of guidelines have been published, describing the optimal treatment of patients with CAP, with the aim of improving patient outcomes. Hospitalised patients have an average mortality rate of 12 percent, with the rate rising to 40 percent for patients with bloodstream infections or requiring intensive care.³

Risk factors include other lung diseases such as cystic fibrosis, COPD, and asthma, diabetes, heart failure, history of smoking, poor ability to cough such as following a stroke, or a weak immune system.⁴ Most of these risk factors are associated with an impairment of the efficacy of host immune defence. Many of these risk factors are also associated with a greater mortality risk.⁵

At risk patients require vaccination for Pneumococcal and influenza infections, and smoking cessation programs to decrease the incidence and severity of CAP.

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Aim

To study the clinical profile and risk factors of Pneumonia (CAP).

MATERIALS AND METHODS

Sample was collected retrospectively from cases admitted in King George Hospital, Visakhapatnam with pneumonia (CAP) over a period of 7 months' time (1st January 2017 to 31st July 2017). Detailed history taking and clinical examination were done. Cases were analysed for various lab investigations, x-ray chest, sputum examination. CT chest which was done in required cases also noted. Age, sex, duration of stay, severity, complications and mortality were noted.

Inclusion Criteria

Both sexes aged more than 12 years who were admitted in medical wards with clinical diagnosis of pneumonia and were radiologically confirmed are included.

Exclusion Criteria

- Both sexes aged less than 12 years.
- Pregnant.
- Only clinical or radiological diagnosis was excluded.

Gender	Incidence
Male	30 (60%)
Female	20 (40%)
Total	50

Table 1. Distribution of Cases According to Gender

Figure 1. Distribution of Cases According to Gender

In this study, the incidence of Pneumonia was more common in males (60%) as compared to females (40%). (Table 1).

Age (years)	Males	Females	Total
11-20	3	1	4 (8%)
21-30	6	3	9 (18%)
31-40	0	3	3 (6%)
41-50	7	4	11 (22%)
51-60	8	5	13 (26%)
61-70	4	3	7 (14%)
71-80	2	1	3 (6%)
Total	30	20	50

Table 2. Distribution of Cases According to Age and Gender

Figure 2. Distribution of Cases According to Age and Gender

In this present study, the highest incidence was found in the age group 51-60 years (26%) followed by 41-50 years (22%) then followed by 21-30 years (18%).

The present study reveals that age up to 50 years constituted 54% and above 50 years constituted 46%. Both males and females are more affected during the age 50 years or less. (Table 2).

Clinical Features	Age		Gender		Total (n=50)
	<_50 Years	>50 Years	Male (n=30)	Female (n=20)	
Fever	16 (32%)	29 (58%)	28 (93%)	17 (85%)	45 (90%)
Cough with expectoration	17 (34%)	20 (40%)	22 (73%)	15 (75%)	37 (74%)
Breathlessness	11 (22%)	11 (22%)	15 (50%)	7 (35%)	22 (44%)
Chest pain	4 (8%)	6 (12%)	5 (16%)	5 (25%)	10 (20%)
Pedal oedema	2 (4%)	0	1 (3%)	1 (5%)	2 (4%)
Haemoptysis	1 (2%)	1 (2%)	2 (6%)	0	2 (4%)
Altered sensorium	0	2 (4%)	1 (3%)	1 (5%)	2 (4%)

Table 3. Distribution of Clinical Features According to Age and Gender

Figure 3. Distribution of Clinical Features According to Age

The table 3 shows that fever (90%) was the most common symptom followed by cough (74%). The study shows that in young patients (age is <50 years) cough with expectoration (34%) was the most common clinical feature followed by fever (32%) and breathlessness (22%) and among old patients (age is >50 years) fever (58%) was the most common clinical feature followed by cough with expectoration (40%) and breathlessness (22%). Pedal oedema and altered sensorium were present each as 4% but the former was seen in younger group and later in older group.

Risk Factor	Age < 50 Years	>50 Years	Male (n=30)	Female (n=20)	Total (n=50)
Diabetes	3 (6%)	5 (10%)	4 (13%)	4 (13%)	8 (16%)
Alcohol	4 (8%)	8 (16%)	12 (40%)	0	12 (24%)
Lung pathology	1 (2%)	3 (6%)	3 (10%)	1 (3%)	4 (8%)
CHF	0	1 (2%)	1 (3%)	0	1 (2%)
Smoking	4 (8%)	14 (28%)	17 (56%)	1 (3%)	18 (36%)
Immune suppressed	1 (2%)	0	1 (3%)	0	1 (2%)
Tuberculosis	1 (2%)	3 (6%)	2 (6%)	2 (6%)	4 (8%)

Table 4. Distribution of Risk Factors According to Age and Gender

Figure 4. Distribution of Risk Factors According to Age

On X-ray (Consolidation)	No. of Cases (n=50)
Right single lobe	23 (46%)
Right two lobes	5 (10%)
Left single lobe	14 (28%)
Left two lobes	0
Bilateral lower lobe	8 (16%)
Total	50

Table 5. Distribution of Cases According to Radiological Findings

Figure 5. Distribution of Cases According to Radiological Findings

In the present study, the radiological finding (consolidation) was more common on right side constituting about 56% of the cases followed by left side (28%) and bilateral involvement in 16% cases. (Table 5).

On right side, upper lobe consolidation was seen in 8%, middle lobe in 6%, lower lobe was seen in 32%, middle and lower lobe was seen in 10% of cases. On left side, lingular involvement was seen in 2%, lower lobe consolidation was seen in 26% of cases. No involvement of left upper lobe was noticed.

Right lower lobe involvement is more common in this study which is closely related to the study conducted by R. S. Pushpa Kumari, V. A. Vipula, Jain S⁶ who found right lower lobe consolidation was more common constituting about 26% of the cases.

Complication	Age < 50 years	>50 years	No. of Cases (50)
Pleural effusion	3	0	3 (6%)
Septic shock	1	1	2 (4%)
ARDS	0	2	2 (4%)
AKI	0	3	3 (6%)

Table 6. Distribution of Complications According to Age

Figure 6. Distribution of Complications According to Age

The Table 6 shows patients >50 years developed more severe complications like ARDS and AKI. Septic shock affected both age groups equally and pleural effusion in < 50 yrs. 20% of cases developed various complications.

Duration of stay	No. of Patients (n=48) Recovered	No. of Patients (n=2) Expired
1-7 days	30 (60%)	2 (4%)
8-10 days	12 (24%)	0
>10 days	6 (12%)	0

Table 7. Duration of Hospital Stay

Figure 7. Duration of Hospital Stay

Table 7 shows most of the patients (60%) recovered within a week and 24% cases recovered in 10 days and 12% cases recovered after 10 days. Mortality (4%) occurred within 3 days of admission into the hospital.

Outcome	No. of Cases (n=50)
Recovery	48 (96%)
Death	2 (4%)
Total	50

Table 8. Outcome

Figure 8. Outcome

In this study, 2 out of 50 (4%) have mortality due to multiple risk factors (alcohol, smoking), age more than 50 years and complicated with ARDS, AKI and pleural effusion.

DISCUSSION

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.⁷

In this study, less incidence was seen in age above 50 years (23%) than up to 50 years (27%) indicating the increased risk of susceptibility in young people. Further, 26% cases are in the age group of 51-60 years which shows that this age group is more vulnerable to lower respiratory tract infections like CAP. Less than 50 years group presented with cough with expectoration and above 50 years group with fever which shows rapid disease progression in the former. In this study, the incidence of Pneumonia was more common in males (60%). Anatomic, lifestyle, behavioural and socioeconomic differences between males and females may explain the observed findings.⁸ Chest x-ray findings generally cannot distinguish one type of infection from another, although multilobar infiltrates suggest *S. pneumoniae* or *Legionella pneumophila* infection and Cavitating pneumonia suggests *S. aureus* or a fungal or mycobacterial aetiology. Right lower lobe involvement is more common (32%) in this study.

Early response to treatment (>3 days) results in reducing duration of hospital stay to a week, late response to 10 days. No response or development of complications leads to more than 10 days hospitalisation. Complications like ARDS, AKI are seen in older age which results in intensive care management and guarded prognosis. In addition to the infection, septic shock is generally thought to be caused by an excessive or uncontrolled pro-inflammatory response.⁹ In this present study, mortality (4%) occurred within 7 days in male

patients who developed complications. Advanced age increases the mortality from pneumonia.

In this present study, smoking (56%) is the most common risk factor in both age groups (50 or less & above 50 years). A study conducted in North-India revealed smoking as the most common risk factor for CAP (as high as 65%).¹⁰ The main mechanisms for this predisposition relate to the suppressive effect that smoking has on the protective actions of the airway mucociliary clearance mechanism, on the various components of the innate and adaptive immune systems of the host, as well as direct effects on microbial pathogens that promote their virulence, and possibly antibiotic resistance.¹¹ Alcohol is the second most common (24%) risk factor in the study. A study by Koivula et al¹² demonstrated a very important independent effect of alcoholism. Alcohol increases incidence of CAP by multiple mechanisms like increased risk of aspiration of gastric acid and/or microbes from oropharyngeal flora, decreased mucous-facilitated clearance of bacterial pathogens from the upper airway, and impaired pulmonary host defences.

It has been reported that old age and COPD impair pulmonary defences and predispose to CAP caused by Gram-negative bacteria. Similar types of findings were also reported from Indian studies.¹³

Identification and determining the clinical patterns and risk factors of Pneumonia (CAP) helps in adoption of regionally optimised diagnostic and therapeutic approach.

CONCLUSION

In Summary, the following points are observed-

1. Commonly affected age group is 51-60 years.
2. CAP is more common in males than females
3. Smoking is the commonest risk factor.
4. The incidence is influenced by the geographic region, patients' age, and presence of the predisposing factors.
5. Complications are common in more than 50 years of age.
6. The risk factors of CAP are both fixed and modifiable. Modifiable risk factors are those factors that are influenced by lifestyle or behavioural changes like heart disease, diabetes, smoking, alcohol. Non-modifiable risk factors are those we cannot control. They include age and gender. Modifiable risk factors should be strictly corrected especially in those who also have fixed risk factors.
7. Patients, particularly elderly and debilitated having risk factors, should be instructed to seek prompt medical care during the early stages of dyspnoea or fever to prevent complications.

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