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## RESEARCH ARTICLE

### CLINICAL SPECTRUM OF COMMUNITY ACQUIRED PNEUMONIA (CAP) IN GERIATRIC POPULATION-A PROSPECTIVE CROSS-SECTIONAL STUDY

Dr. Naveed Anjum Qureshi, \*Dr. Viney Sambyal and Dr. Sanjay Sharma

\*Lecturer Medicine, Post Graduate Department of Medicine, GMC Jammu, India

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\*Corresponding author: Dr. Viney Sambyal

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#### ABSTRACT

**Background:** Community-acquired pneumonia in adults has a morbidity and mortality ranging between 10% and 29%. Increasing age is associated with a higher mortality. The factors influencing the outcome in elderly patients are thought to be different from those in young adults. We, therefore, studied the clinical profile and predictors of outcome in adults with community-acquired pneumonias. **Methods:** 540 patients with community-acquired pneumonia were included in the study over a period of 12 months. A detailed history was obtained and physical examination done. A chest X-ray was done to establish the diagnosis and haematological, biochemical and arterial blood gas estimations were carried out. CECT Chest was done in selected cases. The data of survivors and non-survivors between 65 to 85 yrs were analysed to determine the clinical profile and outcome in these groups. **Results:** The clinical features, laboratory parameters and complications from pneumonia were analysed. Males were more commonly affected than females (1.5:1). 8.5% of elderly patients succumbed to fulminant sepsis followed by pleural effusion (5.9%). Old age, history of smoking, presence of chronic obstructive airways disease, late presentation to hospital, systolic and diastolic hypotension, high blood urea, raised liver enzymes and development of septic shock were associated with a higher incidence of complications and a poorer prognosis. In addition, older patients with a poor outcome also had symptoms for a longer duration and a poor neutrophilic response to infection. **Conclusion:** The presence of certain factors leads to a higher incidence of complications and a poorer prognosis. These factors are good predictors of outcome. Identification and determining the clinical patterns of community acquired pneumonia helps in adoption of regionally optimized diagnostic approach.

## INTRODUCTION

With increasing life expectancy geriatric population [people aged 65 and above] contribute to significant percentage of the world population. It has been projected that by the year 2050, the number of elderly people would rise to about 324 million. Current life expectancy is 62.3 years for males and 65.3 for females. They also contribute to significant percentage of respiratory diseases (Lee *et al.*, 2011). Aging has been shown to be associated with gradual decline in many aspects of pulmonary functions, waning of immunity and the immunological mechanisms show a declining efficiency as the antibodies formed much less rapidly in old age than in younger adulthood. This study is to find the current spectrum of respiratory diseases (Jarad *et al.*, 2011) in geriatric population in a tertiary care centre.

**Aims and Objectives:** To study the current profile of Community Acquired Pneumonia in geriatric population attending a tertiary care centre.

## MATERIALS AND METHODS

Pneumonia was defined as an acute respiratory illness with a new, previously unrecorded, pulmonary shadow on chest X-ray. The disease was considered to be community-acquired if the patient was hospitalized with the disease or developed symptoms and signs of pneumonia within 48 hours of hospitalization. Patients were evaluated in the following manner: (i) detailed history, (ii) physical examination, (iii) chest X-ray to establish the diagnosis of pneumonia, (iv) Complete haematological and biochemical profile and (v) arterial blood gas estimation. In this study, 540 patients were studied in which males were 326 (60.4%) & females were 214 (39.6%). 380 patients (70.4%) belong to the age group 65-74 years & 120 patients (22.2%) in 75 to 84 year's age group and rest more than 85 yrs. . Respiratory morbidity profiles of these patients are given in following tables 1-9.

**Source of data:** The patients diagnosed as CAP and admitted in GMC Jammu.

**Method of collection of data:** During the study period from January 2017 to December 2017, patients who were diagnosed as CAP were selected.

**Sample size -540 In-Patients**

#### Selection criteria

**Inclusion criteria:** All adult patients of both genders, who are recently diagnosed as Community Acquired Pneumonia (CAP) aged above 65 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.

**Statistical software:** Chi-square was used to test the significance of percentage of various parameters. The Statistical software namely SPSS 11.0 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

A prospective clinical study consisting of 540 CAP patients is undertaken to investigate the magnitude and pattern of clinical presentation. The study group consisted of 540 patients, among whom 326 (60.4%) were males and 214 (39.6%) were females. Among 540 patients, 70.4% were between 65 to 74 yrs, 22.2% between 75 to 84 yrs and rest were more than 85 yrs (7.4%)(Table 1 & 2). Most common predisposing factor associated with CAP in elderly was Smoking (66.7%) followed by COPD (44.4%) (Table 3). Among 540 patients, 370 (68.5%) had cough followed by fever in 284 (52.6%).116 (21.5%) patients had dyspnoea and 18.5% had chest Pain. 15.2% patients presented with Altered sensorium while 5.9% with GIT symptoms (Table 4). Most of patients who presented with CAP were anaemic with pallor seen in 136(25.2%) patients followed by Icterus on examination in 11.5% patients (Table 5). 79.3% patients presented with tachypnoea, 68.1% with Tachycardia, 64.1% with raised Temperature, 15.9% with Hypotension as shown in Table 6. Among the laboratory parameters, 166 patients (30.7%) had anaemia (Hb<11gm/dl), 426 patients (78.9%) with leucocytosis (>11000/cumm), 34 patients (6.3%) with leucopenia (<4000/cumm).Raised urea levels were seen in 206 patients (38.1%) followed by raised S.creatinine in 86 patients (15.9%) rest details are shown in Table 7. Among the complications, majority of patients presented with septic shock (8.5%), followed by pleural effusion (5.9%) and Congestive cardiac failure (5.7%), rest

shown in Table 8. Association of complication with mortality was found to be significant (P=0.005) (Table 9).

**Table 1. Sex Distribution**

Sex	Number of patients (n)	Percentage (%)
Male	326	60.4
Female	214	39.6
Total	540	100

**Table 2. Age Distribution**

Age in yrs	Number of patients (n)	Percentage (%)
65-74	380	70.4
75-84	120	22.2
>85	40	7.4
Total	540	100

**Table 3. Predisposing Conditions**

Predisposing conditions	Number of patients (n)	Percentage (%)
Smoking	360	66.7
Alcoholism	80	14.8
COPD	240	44.4
Diabetes Mellitus	156	28.9
Congestive cardiac failure	80	14.8
Neurologic diseases	40	7.4
Renal diseases	30	5.6
Chronic liver diseases	20	3.7
Malignancy	10	1.9

**Table 4. Symptomology**

Presenting Symptoms	Number of Patients (n)	Percentage (%)
Cough	370	68.5
Expectoration	326	60.4
Fever	284	52.6
Dyspnoea	116	21.5
Pleuritic Chest Pain	100	18.5
Altered Sensorium	82	15.2
Gastrointestinal symptoms	32	5.9

**Table 5. General Physical Examination**

Signs	Number of Patients (n)	Percentage (%)
Pallor	136	25.2
Icterus	62	11.5
Cyanosis	42	7.8
Clubbing	18	3.3
Pedal edema	46	8.5

**Table 6. Vital Signs**

Vital signs	Number of patients (n)	Percentage (%)
Temperature > 38°C	346	64.1
Tachypnoea>24/min	428	79.3
Tachycardia >100/min	368	68.1
Hypotension <90mmHg	86	15.9
Temperature <35°C	3	0.6

**Table 7. Laboratory parameters**

Laboratory parameters	Number of patients (n)	Percentage (%)
Anaemia <11g/dl (13-15g/dl)	166	30.7
Leucocytosis>11000/cumm(5000-10000/cumm)	426	78.9
Leucopenia<4000/cumm	34	6.3
High Random Blood Glucose levels >200mg/dl(90-130mg/dl)	86	15.9
Raised S. Urea >40mg/dl(20-40mg/dl)	206	38.1
S.Creatinine>1.2mg/dl(0.1-1.2mg/dl)	86	15.9
Raised Bilirubin>1.2mg/dl(0.2-1 mg/dl)	66	12.2
Raised Liver Enzymes		
SGOT 9-40IU/L	82	15.2
SGPT 10-35IU/L		
Hyponatremia (135-145meq/l)	42	7.8

Table 8. Complications

Complications	Number of Patients (n)	Percentage (%)
Septic Shock	46	8.5
Pleural Effusion	32	5.9
CCF	31	5.7
ARDS	26	4.8
Lung Abscess	10	1.9
Emphyema	4	0.7

Table 9. Association of Complications with mortality

Complications	Survivors(n=484)	Non survivors (n=56)	Total	Chi Square	P wave	Inference
Septic Shock	24	22	46	43.8	0.005	Highly Significant(HS)
Pleural Effusion	32	0	32			
CCF	26	5	31			
ARDS	4	22	26			
Lung Abscess	4	6	10			
Emphyema	3	1	4			

## DISCUSSION

A higher prevalence of smoking and pre-existing respiratory and non-respiratory diseases have been reported earlier in elderly patients (Venkatesan *et al.*, 1990), indicating an association between respiratory tract infection and diseased lungs and smoking. The susceptibility to infection was probably also increased by the presence of immunocompromised conditions such as haematological malignancies, diabetes and chronic renal failure in elderly patients. Patients with community-acquired pneumonia were more frequently above 50 years of age (60%). Compared to younger patients, elderly patients had a higher prevalence of smoking ( $p < 0.01$ ) and an underlying chronic respiratory ( $p < 0.01$ ) or nonrespiratory disease ( $p < 0.05$ ). A higher prevalence of smoking and pre-existing respiratory and non-respiratory diseases have been reported earlier in elderly patients, (3) indicating an association between respiratory tract infection and diseased lungs and smoking which is similar to our study. The susceptibility to infection was probably also increased by the presence of immunocompromised conditions such as haematological malignancies, diabetes and chronic renal failure in elderly patients. Similar to earlier reports, (Venkatesan *et al.*, 1990) respiratory symptoms and fever were frequently seen in elderly patients. Atypical manifestations such as a fall, immobility and incontinence were not encountered. Chest signs were bilateral and diffuse in elderly patients possibly because of pre-existing lung diseases. Septic shock as a complication of pneumonia was associated with high and early mortality (within 4 days of hospitalization) and has been reported earlier. It has been generally accepted that though antibiotic therapy has significantly improved the outcome of patients with pneumonia, death from septicaemia has not shown a similar trend. The mortality rates in our study for different age groups were similar to those in previously reported studies. Farr *et al.* (1991) identified 75 variables from the literature which influenced mortality from pneumonia (Farr *et al.*, 1991). However, the prognostic factors identified by the British Thoracic Society study, such as tachypnoea (respiratory rate  $> 30$  per minute), diastolic blood pressure  $> 60$  mmHg and blood urea  $> 7$  mmol/L, were most consistent. Most variables detected in the present study such as old age, history of smoking, presence of COAD, late presentation to hospital, systolic and diastolic hypotension, raised blood urea, low serum albumin and development of septic shock, have been reported earlier. Their correlation with death is not unexpected. They indicate a higher risk of respiratory infection and poorer

outcome in elderly subjects, especially smokers and those with smoking-related airway disease. While fulminant infection due to late treatment, poor neutrophil response or inadequate phagocytosis lead to septic shock, hypotension and raised blood urea are indicative of multiple-organ failure due to septicaemia (Niederman *et al.*, 1993; The British Thoracic Society, 1993; Benson *et al.*, 1970; Vladimir Kaplan and Derek angus, 2002; Fernandez –sabe *et al.*, 2003)

## Conclusion

Ageing predisposes to a higher risk of respiratory tract infection in individuals with smoking-related lung diseases and debilitating non-respiratory diseases. Though the manifestations and complications are similar in all age groups, the mortality increases steadily with age. Fulminant sepsis and subsequent multi-organ failure are the most frequent events before death. The presence of certain factors leads to a higher incidence of complications and a poorer prognosis. These factors are good predictors of outcome. Identification and determining the clinical patterns of community acquired pneumonia helps in adoption of regionally optimized diagnostic approach.

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