

# Outcome and Characteristics of Community Acquired Pneumonia Patients: A Single Centre Study

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## ABSTRACT

**Background:** Community-acquired pneumonia is the most common form of pneumonia and is a major contributor to both morbidity and mortality globally.

**Objective:** To assess the outcome and characteristics of Community Acquired Pneumonia patients

**Methodology:** The current study was cross sectional study carried out at the pulmonology department, Lady Reading Hospital, Peshawar from January 2023 to June 2023. The demographic information, co-morbid illnesses, smoking history, CURB 65 score, and chest X-ray results of each patient were carefully recorded. The data was analyzed by using SPP-24.

**Results:** A total of 180 patients were enrolled in this study. There were 108 (60%) male participants whereas 72 (40%) were female participants. Based on CURB 65 score, CURB 65 score 2, CURB 65 score 3 and CURB 65 score 4 was observed in 36 (20%), 33 (18.33%) and 12 (6.67%) patients respectively. Based on laboratory findings, >11000 WBCs were observed in 144 (80%) patients while <150,000 platelets count were observed in 36 (20%) patients. The overall mortality rate in our study was 27 (15%).

**Conclusion:** Our study concludes that the mortality rate associated with community acquired pneumonia was high. The major complications associated with the community acquired pneumonia were parapneumonic effusion and empyema in our study.

**Keywords:** Characteristics; Outcome; Community Acquired Pneumonia

## INTRODUCTION

Community-acquired pneumonia is the most common form of pneumonia and is a major contributor to both morbidity and mortality globally<sup>1</sup>. Severe Community-acquired pneumonia (SCAP) has no clear description, and this categorization encompasses a diverse range of individuals. The criteria that are presently being utilized to define SCAP in the recommendations are predicated on the existence of severe acute respiratory failure (ARF) that requires invasive mechanical ventilation (IMV) or septic shock with organ system dysfunction<sup>1, 2</sup>. Alternatives include a number of minor criteria that call for intense monitoring and care<sup>1</sup>. Despite receiving adequate antibiotic treatment, 16% to 36% of individuals with severe CAP may succumb to their illness quickly<sup>3, 4</sup>. Therefore, attempts to reduce SCAP mortality should focus on groups of patients with an elevated risk of death. IMV may be necessary for individuals who have SCAP and life-threatening ARF<sup>5</sup>. IMV usage, yet, has a substantial mortality rate<sup>6</sup> and a number of problems<sup>7, 8</sup>. Irrespective of the usage of this kind of life support, the requirement for IMV may potentially be a sign of a more serious acute condition. But no prospective research has thoroughly evaluated the effect of IMV in successive series of SCAP patients. A frequent issue in public health is community-acquired pneumonia (CAP). Between 3 and 40 cases per 1,000 people occur every year, and between 40-60% of cases result in hospitalization. Hospitalized individuals had a 10% overall death rate<sup>9</sup>. Various descriptive studies have documented a number of risk variables for contracting CAP, death, morbidity, difficulties, and illness severity. However, the results differ amongst the communities where these investigations have been done<sup>10, 11</sup>. There might be a number of causes for these variances. For instance, delay in seeking medical attention, using antibiotics appropriately, the patient's perspective of the illness, and co-morbidities may have all had a part in determining the complications and result of the CAP. CAP is a prevalent illness that has a high fatality rate in Pakistan as well. In order to assess the features and outcome of individuals with community-acquired pneumonia, we designed this research.

## MATERIALS AND METHODS

The current study was cross sectional study carried out at the pulmonology department, Lady Reading Hospital, Peshawar. The duration of the current study was six months from January 2023 to

June 2023. The study was approved by the ethical and research committee of the hospital. A total of 180 patients were enrolled in this study based on WHO sample size calculator. A new radiological infiltrate was considered to meet the criteria for CAP when one of the main criteria or two of the minor criteria were present [17]. Minor criteria were dyspnea, pleuritic discomfort, altered mental state, pulmonary consolidation on auscultation, and leukocytosis of more than  $12 \times 10^9/L^{-1}$ , while major criterion comprised cough, expectoration, or fever of more or equal to  $37.8^\circ C$ . Patients, who were immune-compromised, had acquired immunodeficiency syndrome, patients receiving chemotherapy or corticosteroids and patients that had recently been discharged from the hospital were not allowed to participate in the study. Patients who had clinical confirmation of a diagnosis other than pneumonia were also not allowed to take part. The demographic information, co-morbid illnesses, smoking history, vital data, CURB 65 score, and chest X-ray results of each patient were carefully recorded. Additional observations were made about laboratory measures such as WBC and platelet counts, hematocrit, BUN, and electrolytes. During the patient's time in the hospital, challenges such as the "development of parapneumonic effusion, empyema, renal failure, multi-organ failure, sepsis and septic shock", and death, if it occurred, were recorded. Through the use of SPP-24, the data was analyzed. The frequencies and percentages of the variables such as gender, as well as the means and standard deviations of the variables such as age, were determined.

## RESULTS

A total of 180 patients were enrolled in this study. There were 108 (60%) male participants whereas 72 (40%) were female participants. (Figure 1) The mean age in the current was 58 ( $\pm 12.11$ ) years while the mean stay in hospital was 4.26 ( $\pm 2.36$ ) days. Out of 180 patients, diabetes was observed in 33 (18.33%) patients, hypertension in 72 (40%) patients, COPD in 33 (18.33%) patients, coronary artery disease in 12 (6.67%), chronic kidney disease in 12 (6.67%), bronchiectasis in 6 (3.33%) patients, myocardial infarction in 6 (3.33%) patients and had congestive heart failure was observed in 6 (3.33%). (Figure 2) Based on smoking status, the active smokers were 36 (20%), ex-smokers were 33 (18.33%) while the non-smokers were 111 (61.67%). Based on chest X-rays, > 1 lobe of the ipsilateral lung was involved

in 108 (60%) patients while bilateral infiltrate was observed in 72 (40%) patients. Based on complications, pleural effusion was observed in 90 (50%) patients, empyema in 9 (5%) patients. Septic shock was observed in 15 (8.33%) patients. Based on CURB 65 score, CURB 65 score 2, CURB 65 score 3 and CURB 65 score 4 was observed in 36 (20%), 33 (18.33%) and 12 (6.67%) patients respectively. (Figure 3) Based on laboratory findings, >11000 WBCs was observed in 144 (80%) patients while <150,000 platelet count was observed in 36 (20%) patients. The overall mortality rate in our study was 27 (15%). (Figure 4)

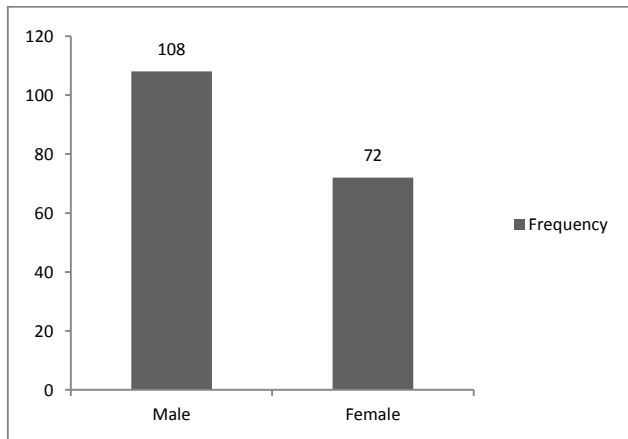


Figure 1: Distribution of patients based on gender

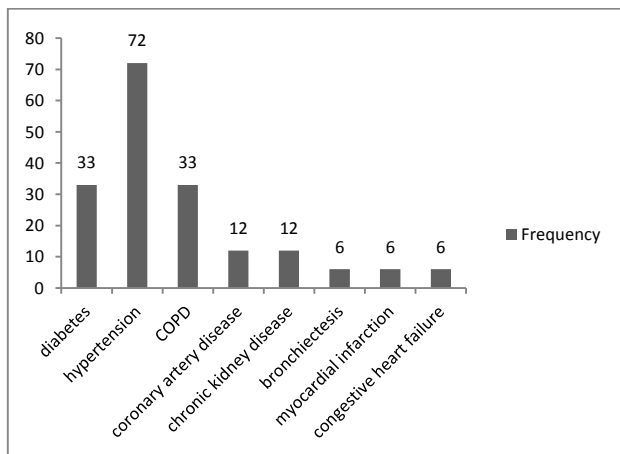


Figure 2: Clinical data of the enrolled patients

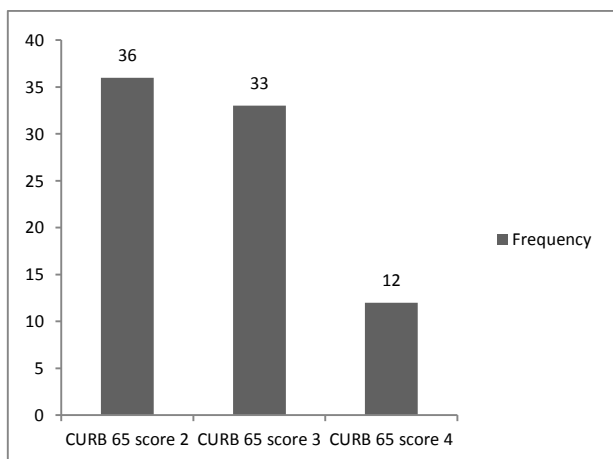


Figure 3: Patients distribution based on CURB 65 score

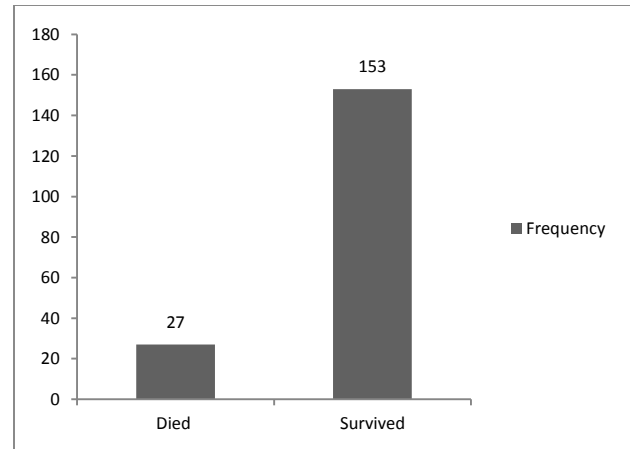


Figure 4: Mortality rate of the enrolled patients

## DISCUSSION

Community-acquired pneumonia is one of the frequent issues in public health. Limited data is available about this issue in our setting. In order to assess the features and outcome of individuals with community-acquired pneumonia, we designed this research. A total of 180 patients were enrolled in this study. There were 108 (60%) male participants whereas 72 (40%) were female participants. The mean age in the current was 58 ( $\pm 12.11$ ) years while the mean stay in hospital was 4.26 ( $\pm 2.36$ ) days. Out of 180 patients, diabetes was observed in 33 (18.33%) patients, hypertension in 72 (40%) patients, COPD in 33 (18.33%) patients, coronary artery disease in 12 (6.67%), chronic kidney disease in 12 (6.67%), bronchiectasis in 6 (3.33%) patients, myocardial infarction in 6 (3.33%) patients and had congestive heart failure was observed in 6 (3.33%). Based on smoking status, the active smokers were 36 (20%), ex-smokers were 33 (18.33%) while the non-smokers were 111 (61.67%). Based on chest X-rays, > 1 lobe of the ipsilateral lung was involved in 108 (60%) patients while bilateral infiltrate was observed in 72 (40%) patients. Based on complications, pleural effusion was observed in 90 (50%) patients, empyema in 9 (5%) patients. Septic shock was observed in 15 (8.33%) patients. The overall mortality rate in our study was 27 (15%). In accordance with our findings, other studies reported comparable rates of mortality due to CAP. They reported 10 and 11% of mortality rate in their studies<sup>9,12</sup>. Another study done by M Farooq reported 16.4% mortality associated with CAP which is almost similar with our results<sup>13</sup>. Among other CAP problems, parapneumonic effusion and empyema have been reported to occur between 7.2 -10.4% in developed nations<sup>10, 14, 15</sup>. Scoring system like the "confusion, urea, respiratory rate, low BP (CURB) score and CURB plus age of 65 years (CURB-65) score", categorized th Community-acquired pneumonia patients into risk groups based on mortality<sup>16,17</sup>. Based on CURB 65 score, CURB 65 score 2, CURB 65 score 3, CURB 65 score 4 was observed in 36 (20%), 33 (18.33%) and 12 (6.67%) patients respectively in our study. Clinicians have long considered the level of leukocytosis in pneumonia patients as a sign of the severity of the illness and the systemic inflammatory response. Due to the link between low platelet counts and severe sepsis and disseminated intravascular coagulation, thrombocytopenia is also a known indicator of poor prognosis in pneumonia patients<sup>17, 18</sup>. The role of platelets in innate immunity, systemic inflammation and adaptive immunity is well known. Because both leukocytes and platelets include antimicrobial peptides that work against a variety of pathogens, their responses in antimicrobial host defense are comparable<sup>18, 19</sup>. Based on laboratory findings, >11000 WBCs was observed in 144 (80%) patients while <150,000 platelet count was observed in 36 (20%) patients. Previous studies from Pakistan reported smoking frequency in 16-30% of the university students<sup>20-22</sup>. Similar smoking habit characteristics are seen in this research group.

Based on smoking status, the active smokers were 36 (20%), ex-smokers were 33 (18.33%) while the non-smokers were 111 (61.67%).

## CONCLUSION

Our study concludes that the mortality rate associated with community acquired pneumonia was high. The major complications associated with the community acquired pneumonia were parapneumonic effusion and empyema in our study.

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