

## Original Research Article

# A study of clinical profile of pneumonia in Shivamogga institute of medical science attached hospital with special reference to curb scoring

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### ABSTRACT

**Background:** Our study was done to study in detail the clinical profile of cases admitted with pneumonia to Mc Ganna hospital, SIMS, Shivamogga. Aim of the study were to study in detail the clinical profile of pneumonia and to know the morbidity and mortality associated with pneumonia by comparing with CURB score.

**Methods:** Ours is a clinical, prospective, observational and open study. The study subjects were pneumonia patients admitted to Shivamogga institute of medical sciences attached McGann hospital, Shivamogga with signs and symptoms suggestive of pneumonia. After obtaining a detailed history and clinical examination the patients were subjected to relevant investigations. The complete data was collected in specially designed case recording form and transferred into a master chart which is then subjected to statistical analysis.

**Results:** We studied 100 cases of pneumonia, out of which 12 patients presented with confusion, 30 patients presented with raised blood urea nitrogen, 28 patients with raised respiratory rate, and 30 patients with hypotension. CURB score of 0 was observed in 54 patients, score 1 in 16 patients, score 2 in 8 patients and score 3 in 22 patients. Prognosis was good in patients aged less than 50 years and those without any comorbidities. Fever was the most common symptom of presentation.

**Conclusions:** Our study had highlighted the fact that CURB scoring is helpful in triaging pneumonia patients but it is not a good predictor of mortality in pneumonia patients.

**Keywords:** CURB, Pneumonia, SIMS

### INTRODUCTION

In 1901 William Osler described pneumonia as the "captain of the men of death."

Pneumonia has been considered a health problem for ages. Despite being the cause of significant morbidity and mortality, pneumonia is often misdiagnosed, mistreated, and underestimated.

The pneumonia is typically classified as:<sup>1</sup> Community-acquired and hospital-acquired or healthcare-associated.

Community-acquired pneumonia (CAP) is a major cause

of morbidity and mortality worldwide.

CAP is a disease in which individuals who have not recently been hospitalized develop an infection of the lungs (pneumonia). Lower respiratory tract infections (LRTIs), including CAP, were ranked third in a list of the 30 leading causes of death worldwide in 1990. Mortality rates are low (<2%) in CAP patients treated as outpatients, but are higher (5 to 20%) among patients hospitalized for CAP, and are highest (up to 50%) in patients admitted to the intensive care.<sup>2</sup> The importance CAP is increasing economically since it is considered the leading cause of absence to jobs, incapacity and activity restriction in developing countries.

The clinical history of CAP may include one or more of<sup>3</sup>: Shortness of breath, cough, pleuritic chest pain, production of sputum, rigors or night sweats and confusion. Causes of CAP include bacteria, viruses, fungi, and parasites.

After achieving a correct diagnosis, the second step is to define if the patient will receive outpatient treatment or hospitalization.

Clues for hospital admission is one of the most important aspect in the treatment of a patient who suffers from CAP. Admission decision is a complex and difficult issue that depends on the severity of the patient's illness and on some specific circumstances such as social conditions, home support, patient or relatives' preferences which may become determinant factors in decision making.<sup>4</sup> Research into community acquired pneumonia over the past two decades has focused on developing tools to measure the severity of illness.

Severity assessment is an important early step in the management of patients presenting with community-acquired pneumonia. Various pneumonia-specific scores, generic sepsis scores and predictive biomarkers have been proposed as tools to aid clinicians in key management decisions. However, there is no uniform agreement about the optimum severity assessment tool to use. This review provides a summary of current evidence surrounding severity assessment in adult patients presenting with community-acquired pneumonia.<sup>5</sup>

Clinical and laboratory features at presentation were used to calculate severity scores using the:<sup>6</sup> Pneumonia severity index (PSI), revised American thoracic society (rAST), British thoracic society (BTS) severity scores CURB and CURB-65.

The sensitivity, specificity, positive and negative predictive values were compared for four different outcomes:<sup>7</sup> Death, need for ICU admission, combined outcomes of death and/or need for ventilatory or inotropic support.

An adequate empirical approach depends on correct knowledge of most frequent local pathogen and the fact that routinely used antibiotics would usually be effective. This approach has the advantage that it avoids delay to start treatment while lab tests are at disposal.<sup>7</sup>

Objectives of the study were to study in detail the clinical profile of pneumonia and to know the morbidity and mortality associated with Pneumonia by comparing with CURB score.

## **METHODS**

### ***Design***

The study design used was prospective study.

### ***Sources of data***

The study was conducted for a period of 1 year starting from November 2019 to October 2020. The source for this study consists of 100 pneumonia patients admitted to medicine department and also referred from other departments.

### ***Place of study***

The study carried out at Mc Gann hospital, SIMS, Shivamogga.

### ***Method of collection of data***

Ours is a clinical, prospective and observational study. The study subjects were patients presenting with signs and symptoms suggestive of pneumonia. After obtaining a detailed history, general physical examination and systemic examination, the patients were subjected to relevant investigations. The complete data was collected in a specially designed case recording form. The data collected was transferred to a master chart which was subjected to statistical analysis. Before submitting the patients for investigation and treatment, informed/written consent was obtained from the patient or legal guardian in the local vernacular language.

### ***Statistical analysis***

All these data-are collected and compiled and statistical analysis performed. Tests of significance were used wherever required, appropriately. Descriptive statistics like mean, standard deviation was calculated. Inferential statistics like Mann-Whitney test was used to compare the parameters between groups.

### ***Inclusion criteria***

Inclusion criteria included all patients presenting with symptoms and signs of pneumonia were included in the study.

### ***Exclusion criteria***

Exclusion criteria excluded pregnant women, children <14 years and patients aged >65 year.

## **RESULTS**

A total number of 100 cases of pneumonia patients admitted McGann hospital SIMS, Shivamogga who met the inclusion criteria were studied.

### ***Age and sex distribution***

Out of the 100 cases studied, 82 (82%) were males and the remainder 18 (18%) were females. Their ages ranged from 20 years to 64 years with a mean of 38.08±9.01. The ratio of male:female was 4:1. The maximum incidence of 68%

was seen in the age group between 20 to 40 years, of which 79.41% (27/34) were males.

**Table 1: The age and sex distribution.**

| Age (years) | Male (%) -82 | Female (%) -18 | Total-100 |
|-------------|--------------|----------------|-----------|
| <20         | 24.3         | 11.1           | 4         |
| 21-30       | 31.7         | 22.2           | 30        |
| 31-40       | 34.14        | 55.5           | 38        |
| 41-50       | 14.6         | 0              | 12        |
| 51-65       | 17.07        | 11.1           | 16        |

**Presenting symptoms**

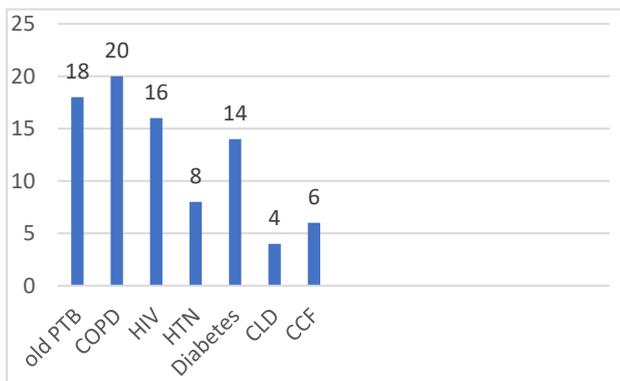
Out of 100 cases, most common presenting symptom was fever in all the patients ie100%, 60% had chills and cough in 94%, of which 63% had expectoration. shortness of breath was present in 28%, pleuritic chest pain in 22%, hemoptysis in16%, altered sensorium in 6% other symptoms in the form of pain abdomen, loose stools, vomiting, headache were complained by 20% of patients.

**Table 2: Sex wise distribution of presenting symptoms.**

| Presenting complaints      | Male (n=82) | Female (n=18) | Total (n=100) |     |
|----------------------------|-------------|---------------|---------------|-----|
|                            | No.         | No.           | No.           | %   |
| <b>Fever</b>               | 82          | 18            | 100           | 100 |
| <b>Cough</b>               | 80          | 14            | 94            | 94  |
| <b>Chest pain</b>          | 14          | 8             | 22            | 22  |
| <b>Hemoptysis</b>          | 12          | 4             | 16            | 16  |
| <b>Shortness of breath</b> | 22          | 6             | 28            | 28  |
| <b>Confusion</b>           | 4           | 2             | 6             | 6   |
| <b>Others</b>              | 14          | 6             | 20            | 20  |

**Associated comorbidities**

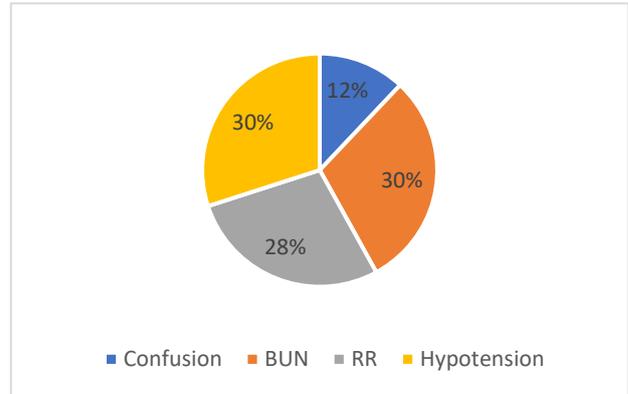
In the present study HIV is found in 16%, COPD in 20%, hypertension in 8%, diabetes mellitus in 14%, chronic liver disease in 4%, congestive heart failure in 6%, old pulmonary tuberculosis in 18%.



**Figure 1: Associated comorbidities.**

**CURB scoring**

In the present study confusion was present in 12%, raised blood urea nitrogen was present in 30%, increased respiratory rate was present in 28%, hypotension was present in 30%.



**Figure 2: Variables of CURB score.**

**Outcome of pneumonia**

In the present study 86% of patients recovered and 14% died.

**Table 3: Outcome of pneumonia patient.**

| Outcome          | Number (n=100) | %  |
|------------------|----------------|----|
| <b>Recovery</b>  | 86             | 86 |
| <b>Death</b>     | 14             | 14 |
| <b>Morbidity</b> | 0              | 0  |

**CURB score in all the pneumonia patients**

In this study score 0 was present in 54%, score 1 in 16%, score 2 in 8%, score 3 in 22%, and score 4 was present in none of the patient

**Table 4: CURB scoring in pneumonia patients.**

| CURB scoring | Male (n=82) | Female (n=18) | Total (n=100) |    |
|--------------|-------------|---------------|---------------|----|
|              | No.         | No.           | No.           | %  |
| <b>0</b>     | 40          | 14            | 54            | 54 |
| <b>1</b>     | 16          | 0             | 16            | 16 |
| <b>2</b>     | 8           | 0             | 8             | 8  |
| <b>3</b>     | 18          | 4             | 22            | 22 |
| <b>4</b>     | 0           | 0             | 0             | 0  |

**CURB score and mortality**

In the above study none of the patient who died of pneumonia had CURB scoring of 0, 28.5% of the patients who died had score of 2, 71.5% had score of 3, and none of them had score of 4.

**Table 5: CURB scoring in expired patients.**

| CURB score | Male (n=10) | Female (n=4) | Total (n=14) |      |
|------------|-------------|--------------|--------------|------|
|            | No.         | No.          | No.          | %    |
| 0          | 0           | 0            | 0            | 0    |
| 1          | 0           | 0            | 0            | 0    |
| 2          | 0           | 4            | 4            | 28.5 |
| 3          | 8           | 2            | 10           | 71.5 |
| 4          | 0           | 0            | 0            | 0    |

## DISCUSSION

The observations made in 100 cases of pneumonia patients admitted to McGann hospital, SIMS, Shivamogga between November 2019 to October 2020, is discussed and compared with other studies.

### Age and sex

In our study, out of the 100 cases studied, 82 (82%) were males and the remainder 18 (18%) were females. Their ages ranged from 20 years to 64 years with a mean of  $38.08 \pm 9.01$ . The ratio of male:female was 4:1. The maximum incidence of 68% was seen in the age group between 20 to 40 years, of which 79.41% (27/34) were males.

Bansal et al in his study on clinical and bacteriological profile of community acquired pneumonia in Shimla, Himachal Pradesh reported that patients mean age was of  $52.77 \pm 18.1$  years.<sup>8</sup> There were 71.4% males and 29.6% were females with male to female ratio of 2.4; 1.74% were more than 40 years of age.

### Presenting symptoms

In our study, out of 100 cases, most common presenting symptom was fever in all the patients ie 100%, 60% had chills and cough in 94%, of which 63% had expectoration. shortness of breath was present in 28%, pleuritic chest pain in 22%, hemoptysis in 16%, altered sensorium in 6% other symptoms in the form of pain abdomen, loose stools, vomiting, headache were complained by 20% of patients.

Bansal et al study reported that most common presenting symptoms was cough in 97% and expectoration in 87% patients followed by fever in 90%, chills in 81%, shortness of breath in 48%, pleuritic chest pain in 34%, hemoptysis in 14%, altered sensorium in 12% spacc, vomiting and loose motions in 10% and abdominal pain in 8% patients.<sup>8</sup>

### Comorbidities associated with pneumonia

In our study HIV is found in 16%, COPD in 20%, hypertension in 8%, diabetes mellitus in 14%, chronic liver disease in 4%, congestive heart failure in 6%, old pulmonary tuberculosis in 18%.

Bansal et al study reported that co-morbid conditions were

noticed in 70% of the patients which were chronic obstructive pulmonary 57% disease, heart diseases 7%.<sup>8</sup> Diabetes mellitus 4.2%. Alcoholism and alcoholic liver disease 2.8%, cerebrovascular accidents 2.8%.

Cham reported that 53.7% had one or more underlying diseases, mostly chronic obstructive pulmonary disease, diabetes mellitus or dementia.

### CURB scoring

In the present study confusion was present in 12%, raised blood urea nitrogen was present 30%, increased respiratory rate was present in 28%, hypotension was present in 30%.

In Bansal et al study, 24% patients were having respiratory rate more than 30 breaths per minute and 13% patients were having evidence of hypotension and 8.5% patient had altered sensorium.<sup>8</sup> Increased respiratory rate in the present study was comparable to Bansal et al study. Hypotension was present in 30% patient which was very high compared to Bansal et al study.

### Outcome of pneumonia

In Bansal et al study mortality was 11 percent. In the present study mortality was 14% which was comparable to the above study.<sup>8</sup>

### CURB scoring and mortality

In the above study none of the patient who died of pneumonia had CURB scoring of 0, 28.5 % of the patients who died had score of 2, 71.5% had score of 3, and none of them had score of 4. In this study CURB scoring is useful in those inpatients of pneumonia who have no comorbidities in assessing the prognosis. If patients have any associated comorbidities, CURB scoring is still useful to triage patients with pneumonia. However, it is not a tool to predict mortality in patients of pneumonia with comorbidities. Thus, CURB scoring system is a poor predictor of mortality compared to other scoring systems like PSI.

In study by Aujesky et al in prospective comparison of three validated prediction rules for prognosis in community-acquired pneumonia concluded that the pneumonia severity index had a higher sensitivity and a somewhat higher negative predictive value for mortality than either CURB score.<sup>9</sup>

## CONCLUSION

Community acquired pneumonia continues to be one of the commonest infectious disease that we come across in our clinical practice and in particularly in Intensive care unit. It is also one of the commonest causes of mortality and morbidity in these settings.

In the present study pneumonia was encountered in all the age group, commonest being 20-40 years.

It is invariably associated various comorbid conditions, common being COPD. Smoking in a well-known and important risk factor through alteration mechanism of the host defense host system.

There are various severity assessing systems to assess the severity pneumonia based on different clinical parameters, CURB scoring system being one amongst them which gives an overview picture of the patient to differentiate the need of aggressive intensive care management to a less extensive outpatient care. But clearly it doesn't predict mortality and morbidity due to pneumonia.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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