

## A Clinical, Bacteriological and Radiological Profile of Community Acquired Pneumonia in Navi Mumbai, India.

Kejriwal. A<sup>\*</sup>, Arjun S. Shenoi<sup>\*\*</sup>, Raghuram Pusukuru<sup>\*\*</sup>, Ciji Sebastian<sup>\*\*</sup>, Kunal Bhuta<sup>\*\*\*</sup>

<sup>\*</sup>Associate Professor <sup>\*\*</sup>Senior Resident <sup>\*\*\*</sup>Junior Resident (MGM Hospital and Medical College, Navi Mumbai)

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### Abstract:

**Background:** Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world. It is a major cause of death among all age groups resulting in 4 million deaths (7% of the world's total death) yearly.

**Objectives:** This study was performed to understand the mode of presentation, its clinical features, bacteriological and radiological features for the early detection of disease, the causative agent and to study its complications.

**Patients And Methods:** A cross sectional study was carried out in MGM Medical College and Hospital, Navi Mumbai, Maharashtra, of 60 patients with the diagnosis of Community Acquired Pneumonia over a period of 2 years. All patients above the age of 14 years who presented with acute onset of fever, cough with expectoration, chest pain and dyspnoea were included in the study and were clinically examined and investigated.

**Results:** The data showed 65% of the patients belonged to the age group of below 50 years with a slightly higher predominance in females, constituting 53.4% of all the cases. Demographically 88% of the patients were from urban population, belonging to the lower socio economic strata.

The most common organism isolated from sputum culture were streptococcus pneumoniae in 34 cases (56%), followed by Pseudomonas in 7 patients (11.1%), E. Coli and Acinetobacter in 3 cases each (5%), Staphylococcus Aureus in 2 patients (3.3%) and Klebsiella in 1 patient (1.3%), while mixed infections were seen in 10 cases (16.7%).

The chest x ray of patients with CAP demonstrated that, the commonest lobe to be involved was the Right Lower Zone in 17 patients (28%), followed by the Left Middle Zone in 7 patients (11.7%). Involvement of 2 zones was seen in 16 patients (26.7%) while bilateral involvement was seen only in 4 cases (6.7%).

Most patients recovered without any complications (73.3%), while para-pneumonic effusion was noted in 4 patients (6.7%). There were 7 patients who developed ARDS of which only 2 patients survived, both requiring mechanical ventilation during the course of stay.

There were 9 deaths out of the 60 patients with CAP.

**Conclusions:** Early diagnosis, especially in high risk patients such as patients with COPD, Diabetes, Alcoholics, Smokers with early initiation of antibiotics based on the prevalence of organisms in that community can help reduce the morbidity and mortality in Community Acquired Pneumonia. Newer vaccines can help reduce the burden of the disease in the community.

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### I. Introduction

Sir William Osler, known as "the father of modern medicine," appreciated the morbidity and mortality of pneumonia, describing it as the "captain of the men of death" in 1918. Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world.<sup>1</sup> It is a major cause of death among all age groups resulting in 4 million deaths (7% of the world's total death) yearly.<sup>2</sup>

This study is to understand the mode of presentation, its clinical features, bacteriological and radiological features for the early detection of disease, the causative agent and to study its complications.

### II. Methodology

A cross sectional study was carried out in MGM Medical College and Hospital, Navi Mumbai, Maharashtra, of 60 patients with the diagnosis of CAP, over a period of 2 years.

### Inclusion Criteria:

All patients above the age of 14 years who presented with the following clinical features were included:

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 Community Acquired Pneumonia.  
Sputum for Gram stain, AFB, and Culture were done.  
Complete haemogram with the Total Leucocyte Count and Differential Count were done.  
Chest X-ray done to know the Site of consolidation.  
ELISA was done to rule out HIV infection.

### **III. Exclusion Criteria:**

Patients with Hospital Acquired Pneumonia were excluded in this study.  
Patients with aspiration pneumonia were excluded and PCP pneumonia in patients with HIV were also excluded.  
All patients were hospitalised and one full course of antibiotics treatment according to sensitivity was given.

### **IV. Results**

In the present study we found that 65% of the patients belonged to the age group of below 50 years with a slightly higher predominance in females, constituting 53.4% of all the cases. Demographically 88% of the patients were from urban population, belonging to the lower socio economic strata.

In the study, 15 patients (25%) were previously diagnosed to have COPD, 13 cases (21.7%) had diabetes. 20 patients (33.3%) were smokers and an equal number of patients (33.3%) were alcoholics.

All the patients presented with fever, cough with expectoration while varying grades of dyspnoea was seen in 70% of the patients. 18.3% of the patients presented with haemoptysis and about 21.3% of patients with altered sensorium.

In our study of 60 patients with Community Acquired Pneumonia, organism isolated from sputum culture were streptococcus pneumonia in 34 cases (56%), followed by Pseudomonas in 7 patients (11.1%), E. Coli and Acinetobacter in 3 cases each (5%), Staphylococcus Aureus in 2 patients (3.3%) and Klebsiella in 1 patient (1.3%), while mixed infections were seen in 10 cases (16.7%).

In our study the chest X ray of patients with CAP demonstrated that, the commonest lobe to be involved was the Right Lower Zone in 17 patients (28%), which was followed by the Left Middle Zone in 7 patients (11.7%). Involvement of 2 zones was seen in 16 patients (26.7%) while bilateral involvement was seen only in 4 cases (6.7%).

Most patients recovered without any complications (73.3%), while para-pneumonic effusion was noted in 4 patients (6.7%). There were 7 patients who developed ARDS of which only 2 patients survived, both required mechanical ventilation during the course of stay.

There were 9 deaths out of the 60 patients with CAP. The poor prognostic markers included tachycardia in 8 patients (88.9%), hypotension in 8 patients (88.9%), increased total leucocyte and tachypnea were observed in all the patients. The Chest X ray of 3 patients (33.3%) showed involvement of 2 lobes.

All patients were treated with antibiotics according to their sensitivity along with supportive management including IV fluids, bronchodilators.

The average hospital stay of the study group was 6 days.

### **V. Discussion:**

The 2014 Pneumonia and Diarrhoea Progress Report released by the International Vaccine Access Centre at Johns Hopkins Bloomberg School of Public health, highlights persisting burden of pneumonia in India.<sup>3</sup> Community acquired pneumonia remains a common and serious illness despite the availability of potent new anti-microbial and effective vaccines. In the recent years both the epidemiology and treatment of pneumonia have undergone changes. Pneumonia is increasingly common in older patients associated with co-morbidities like COPD, Diabetes, Renal Failure, Congestive heart failure, CLD and other conditions.<sup>4</sup> Previous studies in other centres in India<sup>4</sup> have observed an increased incidence of CAP in patients above the age of 50 years while in our population 65% of the patients were below the age of 50 years most of which were daily wage workers and from a poor socio economic strata. The risk factors include smoking, alcoholism and other associated co morbidities including COPD and Diabetes, which is found to be similar to our study.<sup>5, 6</sup>

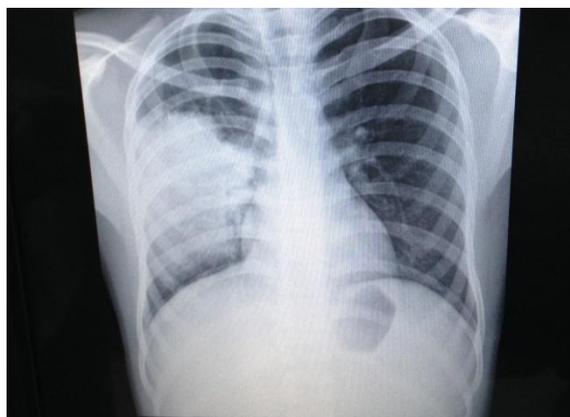
The microbiological profile of patients observed showed that Streptococcus Pneumonia is the most common organism causing CAP around our centre, which is in accordance to studies all around the world.<sup>7-12</sup>

The most common zone of involvement in our study was the Right middle zone on Chest X-ray which helps confirm clinical suspicion, to establish the location, its extent and severity, furthermore, it allows differentiation between pneumonia and other diseases, to detect complications and useful in follow up of patients. The

resolution of radiological infiltrates often ensues several weeks or months after clinical recovery, especially in elderly and in multi lobar pneumonia cared for in Intensive Care Units.

The mortality in our study (15%) was similar to the study conducted in Jammu and Kashmir, which was also 14%.

The clinico-bacteriological profile of CAP in the region around our centre in western Maharashtra is similar to other parts of India as well as the world, while further investigations are required for identifying viral, atypical organisms causing Community Acquired Pneumonia in all patients admitted.



## **VI. Conclusion**

Long recognised as a major cause of death, Pneumonia has been studied intensively since the late 1800s, the result of which led to many formative insights in modern microbiology, despite this research and the development of anti-microbial agents, pneumonia remains a major cause of complications and death. Early diagnosis, especially in high risk patients such as patients with COPD, Diabetes, Alcoholics, Smokers with early initiation of antibiotics based on the prevalence of organisms in that community can help reduce the morbidity and mortality in Community Acquired Pneumonia. Application of molecular diagnostic techniques has the potential to lead to more targeted therapy in the face of increasing antibiotic resistance. The advent of conjugate vaccines against Bacteria- Pneumococcus, H. Influenza, and Viruses- Influenza could help reduce burden of the disease in the community.

### **Abbreviations:**

CAP – Community Acquired Pneumonia  
MGM – Mahatma Gandhi Mission  
COPD – Chronic Obstructive Pulmonary Disease  
PCP – Pneumocystis Carinii pneumonia  
HIV – Human Immunodeficiency Virus  
AFB – Acid Fast Bacilli

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