



Original Research Article

A Study of Prognosis and Outcome of Community Acquired Pneumonia in a Tertiary Care Centre

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ABSTRACT

Keywords

Community Acquired Pneumonia, *Staphylococcus aureus*, *Bacillus cereus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Escherichia coli*

A person suffered community acquired pneumonia if he develops symptoms of pneumonia outside the hospital or within 48 hours of admission. The most common cause of CAP is *Streptococcus pneumoniae*. CAP can vary from indolent to fulminant in presentation and from mild to fatal in severity. The various signs and symptoms depend upon progression and severity of this infection. This study was performed on 50 patients between 17 - 75 with clinical symptoms suspected to be CAP for over a period of 2 years at the emergency and outpatient departments of General Medicine and Chest of D.Y Patil Hospital, Pimpri, Pune. Chest radiograph, Full blood count, ESR, Urea, Electrolytes, Liver function Tests, C reactive protein Test were performed for all patients. CAP was prominently seen in males and in above the age group of 50 years. CAP was found to be mainly unilobar and *Staph aureus* being the predominant organism isolated in the blood while in sputum it was *Streptococcus pneumoniae*. More number of patients showed systemic complications rather than local complications. Since the incidence of CAP is very high in our area and is more prominent in males rather than in females in the age group above 50 years, it is imperative that regular tests need to be done for CAP in the community to keep this disease in check.

Introduction

Community acquired pneumonia (CAP) is defined as one with features of pneumonia that begins outside the hospital or is diagnosed within 48 hours after admission to

the hospital, in a patient who has not resided in a long term care facility for 14 days or more before the onset of symptoms⁽¹⁾. CAP in combination with influenza was the 7th

leading cause of death in the US⁽²⁾. As estimated 4 million adults were diagnosed with CAP in US, resulting in 1.2 million hospitalizations⁽³⁾. The annual incidence of CAP in those aged over 65 years has been estimated to be between 24 and 44 cases per 1000⁽⁴⁾. About 15 million children die each year as a consequence of acute respiratory infection, 1/3rd of them from pneumonia. 96% of these occur in developing countries^(5,6).

The most common cause of CAP is *Streptococcus pneumoniae*, followed by *Haemophilus influenzae*, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, *Staphylococcus aureus*, Tuberculosis, *Neisseria meningitidis*, *Klebsiella pneumoniae*, to name a few bacteria. *Pneumocystis carinii pneumoniae*, *Cryptococcus pneumoniae*, *Histoplasma capsulatum*, Influenza virus, Adeno virus, RSV are some of the fungal and viral causes⁽⁷⁾.

CAP can vary from indolent to fulminant in presentation and from mild to fatal in severity. The various signs and symptoms depend upon progression and severity of this infection. The patient is frequently febrile, with tachycardia, chills and / or sweats and cough that may be non productive or productive which may be mucoid, purulent or blood tinged. If the pleura is involved the patient may experience pleuritic chest pain. Upto 20% of the patients may have gastrointestinal symptoms, such as nausea, vomiting, and/ or diarrhea, fatigue, headache, myalgia, arthralgia⁽¹⁾.

Material and methods

This study was performed over a period of 2 years at the emergency and out patient departments of General Medicine and Chest of Mallareddy Institute of Medical Sciences, on patients with clinical symptoms

suspected to be CAP. 50 Patients between 17 - 75 years of age were included in the study. Chest radiograph, Full blood count, ESR, Urea, Electrolytes, Liver function Tests, C reactive protein Test were performed for all patients. Specific investigations like microbiological analysis of sputum, blood, pleural fluid and culture and sensitivity were done.

Complications and outcomes of the patients in terms of recovery and death were recorded. Correlation between the organism and its clinical, radiological and pathological features were analyzed and the most common cause of CAP was identified.

Results and Discussion

A total of 50 patients between the age of 17 – 75 years were studied. CAP was found to be more prominent in the age group of 51 – 64 years (5), with the incidence marginally decreasing as the age increases. It was found to be comparative lower in the younger age group (chart:1). Males had a higher incidence of CAP than females (Chart : 2)

The common features that were observed were Fever (96%), Cough (93%), Shortness of breath (SOB) (85%), Chest pain (58%)

Of the organisms isolated, *Staph aureus* and *Streptococcus pneumoniae* were more prominent in blood culture with 2 out of 5 positive growths each. In sputum and Pleural fluid, the most common organism isolated was *Streptococcus pneumoniae*, while the *E. coli* and *Klebsiella* in Pleural fluid were 1 each (Table 1)

Over all, *Streptococcus* was isolated in majority of the cases followed by *Klebsiella pneumoniae*. (Fig: 3) Among the radiographs studied, most of the cases were Unilobar with very few multilobar. (Fig:4)

Very few patients had local complications like Pleural effusion-8 (16%), Collapse consolidation 3 (6%), and Empyema 1(2%), but systemic complications were observed in more number of patients with CAP (fig 4)

CAP is one of the most infectious diseases and cause of morbidity and mortality worldwide.

In our study, we observed a greater incidence of CAP in the age group above 50 years (48%). Such observation was noted by Jokinen et al (8), who reported that incidence of CAP increased rapidly for each year of age over 50 years and the rate was as high as 20 cases per 1000 per year. In another study by Kim et al, 41% of incidence of CAP was seen in elderly (9) and 11.6 per 1000 by TJ Marrie⁽¹⁰⁾

We reported a greater incidence of CAP in males (70%), which was corroborated by studies by Leroy et al and Tadashi Ishida et al who reported (65.6%), (72%) respectively (11, 12).

In the study, 96% of the patients had a history of fever, 88% had cough, 84 % SOB and 54% had chest pain which were the common symptoms. In a similar study by Neill and Martin et al, 88% had cough with 64% having sputum production. 57% having chest pain⁽¹³⁾

Blood culture was positive in 8% of the cases while sputum had a yield of 26% in our study while Bohte et al⁽¹⁴⁾ reported a culture positive of 16% and 61% for blood and sputum cultures.

Tadashi Ishida et al reported 5% positivity in blood cultures and 55% in sputum cultures, while Carlos e al reported 10% in Blood and 33% in sputum⁽¹⁵⁾.

The most common organism isolated was streptococcus pneumonia accounting for 11 cases of the total patients .

In many similar studies world wide, streptococcus pneumoniae was found to be the predominant organism accounting for 13.3% by fine et al⁽¹⁶⁾. This was followed by H. influenza (1.5%), mixed growth in 0.91%, Coxiella burnetti in 0.5% of the cases.

Lim et al⁽⁹⁾ reported 48% Pneumococcus isolated followed by Chlamydia pneumonia (13%), H. influenzae (7%), Mycoplasma pneumoniae (3%). 23% was reported by Tadashi et al in Japan followed by H. influenza (7.4%).

Interestingly, none of them reported Klebsiella or Pseudomonas which were the other common organisms isolated by us.

Radiologically, 82% of the patients presented with unilobular involvement with a single lobe of the lung being involved. Only 18% of them had an involvement of more than 2 lobes which was similar to the studies by Keith et al where 55% of the patients had unilobular involvement.⁽¹³⁾ and Albaum et al with 41.5% unilobular and 33.9 % were multilobular.⁽¹⁷⁾

Our study showed local complications in 24% patients and systemic in 36% patients. Septic shock was seen in 16% of the cases followed by renal failure (12%) and respiratory failure (8%).

Among the local complications, 16% presented with pleural effusion, 6% with collapse consolidation and 2% with empyema. In a similar study by Leroy et al, septic shock was seen in 45.2% of the cases and multiple organ failure in 17.4%. Pleural disease was seen in 34% of the cases by et al⁽¹¹⁾

Table.1

Site	No of positives	Organism	Number (%)
Blood	5	<i>Staph aureus</i>	2 (40%)
		<i>Strept. pneumoniae</i>	2 (40%)
		<i>Pseudomonas</i>	1 (20%)
Sputum	14	<i>Strept. pneumoniae</i>	7 (50%)
		<i>Klebsiella pneumoniae</i>	5 (35.7%)
		<i>E. coli</i>	1 (7.1%)
		<i>Enterobacter</i>	1 (7.1%)
Pleural fluid	4	<i>Strept. pneumoniae</i>	2 (50%)
		<i>Klebsiella pneumoniae</i>	1 (25%)
		<i>E. coli</i>	1 (25%)

Chart.1 Age wise distribution of the incidence of CAP

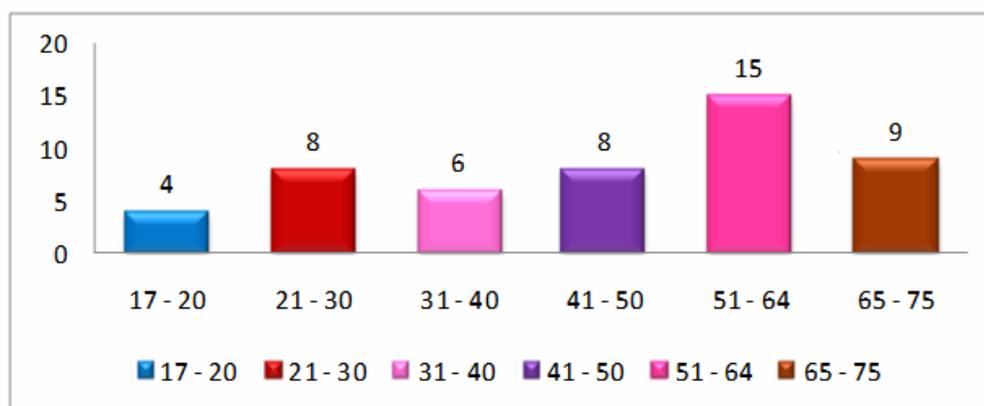


Chart.2 Sex wise distribution

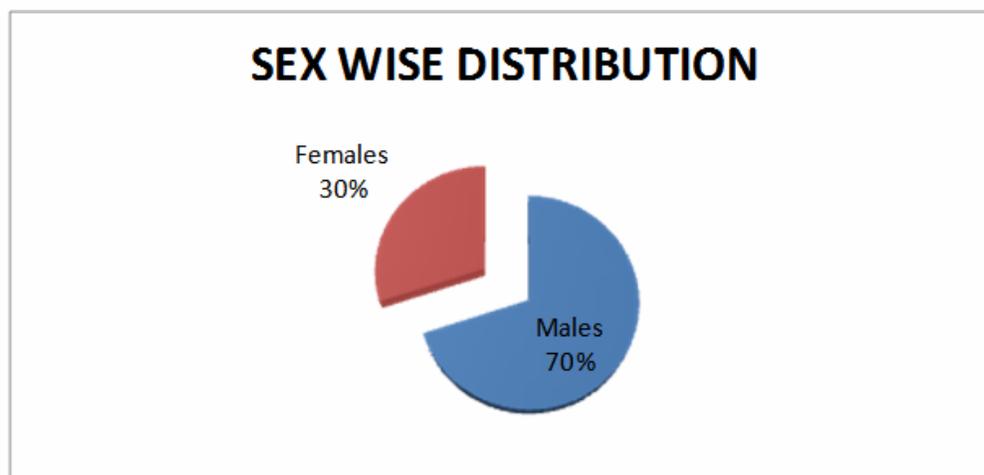
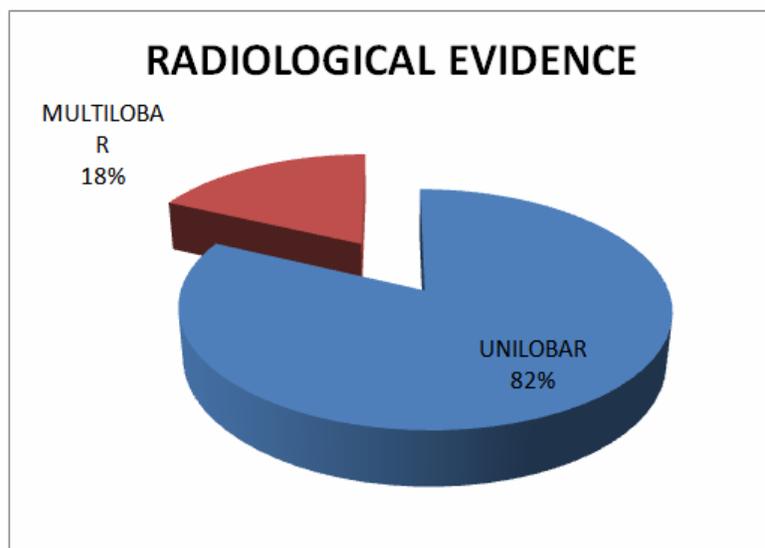
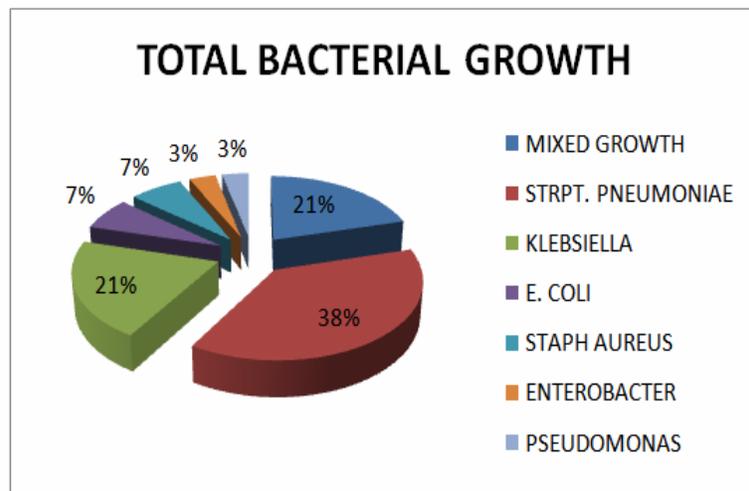
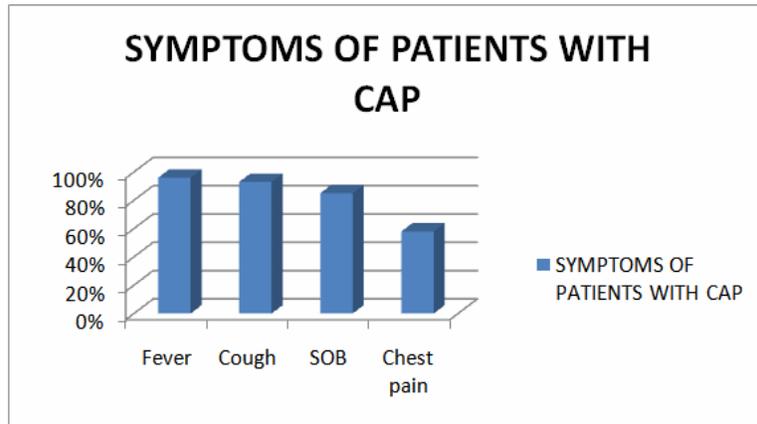
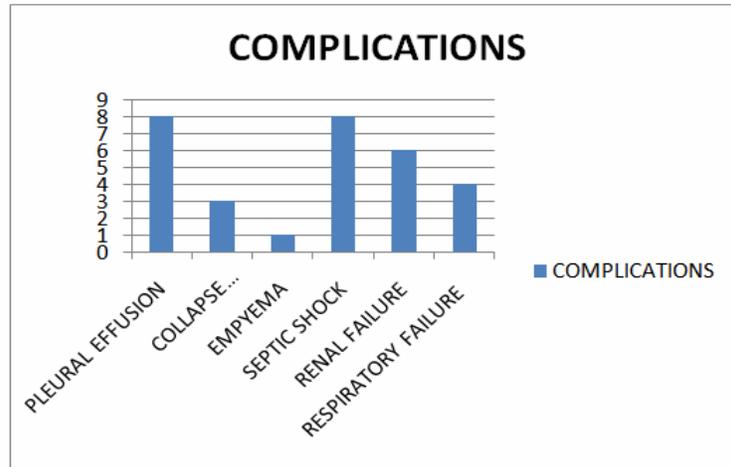


Chart.3 The common symptoms observed in patients with CAP





In conclusion, community acquired pneumonia is more prevalent in males than in females and in patients above the age group of 50 years, with *Streptococcus pneumoniae* being the most common bacterial cause. CAP mainly causes unilobar infection and may lead to systemic and local complications like septic shock and pleural effusion.

The prevalence of Community Acquired Pneumonia among the out patients of our college is very high. As the symptoms of pneumonia is very similar to that of flu, the patients may not seek professional help on time. Therefore it is essential to educate them with reference to the signs and symptoms and take proper action in time to prevent morbidity and mortality.

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