ISSN: 2279 - 0594

Journal of Biomedical and Pharmaceutical Research
Available Online at www.jbpr.in
CODEN: - JBPRAU (Source: - American Chemical Society)
Volume 4, Issue 4, July-August, 2015, 64-67

Research Article

CLINICO-MICROBIOLOGICAL PROFILE OF COMMUNITY ACQUIRED PNEUMONIA IN A TERTIARY CARE HOSPITAL

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Received 10 July 2015; Accepted 28 July 2015

ABSTRACT

Community Acquired Pneumonia (CAP) is a frequently encountered lower respiratory tract parenchymal lung infection which continues to be a major health problem leading to significant morbidity and mortality worldwide. Etiology of CAP is generally bacterial but the microbial pattern varies geographically. Some of the studies conducted in India have reported Streptococcus pneumoniae as the most common causative agent and others have reported Pseudomonas aeruginosa as the common pathogen. The choice of empirical therapy for CAP has become complicated by the rapid development of drug resistance to commonly used drugs. The resistant strains of bacteria can quickly multiply and spread within the community. This was a retrospective study conducted in a tertiary care hospital in South India from May 2011 to April 2013. The cases were recorded from the Microbiology laboratory. A total of 136 cases were included for analysis. Maximum case was in males and in age group of 51-60 years. Most common symptoms/signs were Cough, Fever, Crepitations and Bronchial breath sound. Most common organism isolated was Streptococcus pneumoniae followed by Pseudomonas aeruginosa and Klebsiella pneumoniae. The overall microbial diagnosis of CAP was confirmed in 33.8% . Choosing the proper antibiotics as initial empiric therapy & later streamlining as per the culture sensitivity pattern is critical in outcome of CAP. Important considerations include penetration into respiratory secretions, spectrum of activity and antimicrobial resistance. Gram negative bacilli as a group are more common than S. pneumoniae. P. aeruginosa is the most common organism among the Gram negative bacilli. Microbiological profile of CAP varies geographically. There is a need to conduct regular prevalence and antibiogram studies to develop empirical guidelines for treatment of CAP in that particular region.

Key words: Community acquired pneumonia, Streptococcus pneumoniae, Sputum culture, Microbiological profile

INTRODUCTION

Community Acquired Pneumonia (CAP) is a frequently encountered lower respiratory tract parenchymal lung infection which continues to be a major health problem leading to significant morbidity and mortality worldwide [1]. Infectious Diseases Society of America defines CAP as “an acute infection of the pulmonary parenchyma that is associated with at least some symptoms of acute infection, accompanied by the presence of an acute infiltrate on a chest radiograph or auscultatory findings consistent with pneumonia in a patient not hospitalized or residing in a long-term care facility for more than 14 days before onset of symptoms”[2,3].

In recent years, both the epidemiology and treatment of pneumonia have undergone changes. Pneumonia is increasingly common among older patients and those with medical disorders like diabetes mellitus, renal failure, congestive heart failure etc [4]. Etiology of CAP is generally bacterial but the microbial pattern varies geographically. Some of the studies conducted in India have reported Streptococcus pneumoniae as the most common causative agent and others have reported Pseudomonas aeruginosa as the common pathogen [5-7]. In adults, particularly in developing countries, pneumonia is the most common cause of hospital visits [8].

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The choice of empirical therapy for CAP has become complicated by the rapid development of drug resistance to commonly used drugs. The resistant strains of bacteria can quickly multiply and spread within the community [9,10]. Various studies have been done in different countries regarding the microbial etiology and bacterial resistance. But there is limited published data describing microbiological causes of pneumonia in India [11]. Hence the present was done to know the clinico-microbiological profile of CAP.

MATERIAL AND METHODS

This was a retrospective study conducted in a tertiary care hospital in South India from May 2011 to April 2013. The cases were recorded from the Microbiology laboratory. CAP was defined as new or progressive pulmonary infiltrates on chest radiograph with at least two of the following four: fever, cough, purulent sputum production or leucocytosis over 10,000/mm^3. Patients with radiographic evidence of tuberculosis, pulmonary infarction, AIDS, Leukemia, CCF, Lung cancer and patients n immunosuppressive therapy were excluded from the study. The data was recorded and analyzed using Microsoft Excel (2007 version). The results are explained in frequency and percentage.

RESULTS

A total of 136 cases were included for analysis. The age and gender distribution of the cases is shown in table 1.

Table 1: Age and gender distribution of the cases (n=136)

Age (Years)	Male (%)	Female (%)
15-20	1 (0.7)	0
21-30	6 (4.4)	2 (1.4)
31-40	15 (11)	4 (2.9)
41-50	23 (16.9)	10 (7.3)
51-60	34 (25)	16 (11.7)
61-70	19 (13.9)	6 (4.4)
Total	**98** (72)	**38**(27.9)

Maximum case was in males and in age group of 51-60 years.

The presenting symptoms and signs are shown in table 2.

Table 2: Symptom and signs (n=136)

Symptom/sign	Frequency	Percentage
Cough	123	90.4
Fever	115	84.5
Crepitations	109	80.1
Bronchial breath sound	96	70.5
Expectoration	55	40.4
Pleuritic chest pain	48	35.2
Dyspnoea	34	25
Pallor	23	16.9
Cyanosis	4	2.9
Hemoptysis	4	2.9

Most common symptoms/signs were Cough, Fever, Crepitations and Bronchial breath sound.

The organisms isolated from various specimens are shown in table 3.

Table 3: Organisms isolated from various specimens

Disease	Frequency	Percentage
Organism cultured from sputum		
Streptococcus pneumoniae	14	10.2
Pseudomonas aeruginosa	13	9.5
Klebsiella pneumoniae	6	4.4
E.coli	2	1.4
Staph. Aureus	2	1.4
S. pyogenes	1	0.7
Organism from blood culture		
Pseudomonas aeruginosa	4	2.9
Staph. Aureus	2	1.4
Klebsiella pneumoniae	1	0.7
Organism from Pleural Fluid		
Staph.aureus	1	0.7
Total	**46**	**33.8**

Most common organism isolated was Streptococcus pneumoniae followed by Pseudomonas aeruginosa and Klebsiella pneumoniae

DISCUSSION

The common age group affected in the present study was 51-60 years. Other studies have also reported similar findings [12,13]. The overall microbial diagnosis of CAP was confirmed in 33.8%, which is very low compared with other parts of India: 75.6% in Shimla [6], 47.7% in Chandigarh [7] and other parts of world, 62% in United Kingdom [14], 68% in Singapore [15] and 56% in Philippines [13]. This can be explained by the fact that the serology for both atypical and viral pathogens was not done in the present study, small sample size of the present study and frequent use of antibiotic in the community. Blood culture positivity of 6% observed in our study is much lower than observed by others 10-24% [17,18].

In the present study the most frequent pathogen was Streptococcus pneumoniae followed by Pseudomonas aeruginosa and Klebsiella pneumonie (table 3). Similar observations were reported by other studies [13,6,7]. But another study reported Pseudomonas aeruginosa as the predominant organism [12]. Streptococcus pneumoniae has been identified as the commonest organism causing CAP all over the world, but some studies, over the last 30 years, have reported higher incidence of gram-negative organisms among culture- positive pneumonias [19-22].

The role of the microbiology laboratory in the diagnosis of CAP remains controversial. As per Gupta, et al., [14] National pneumonia guidelines, yield of sputum culture varies from 34% to 86% .In our study, organism was found only in 33.8% of sputum culture reports. Choosing the proper antibiotics as initial empiric therapy & later streamlining as per the culture sensitivity pattern is critical in outcome of CAP. Important considerations include penetration into respiratory secretions, spectrum of activity and antimicrobial resistance. These factors limit the usefulness of drugs such as amoxicillin, erythromycin and trimethoprim-sulfamethoxazole [13].

Limitations of the study

The present study was a retrospective study, and we did not test the anti-microbial susceptibility. Future studies should include the anti-biogram of common organisms isolated and include test for atypical and viral pathogens.

CONCLUSION

Streptococcus pneumoniae was the most common organism isolated from community acquired pneumonia patients. Gram negative bacilli as a group are more common than S. pneumoniae. P. aeruginosa is the most common organism among the Gram negative bacilli. Most common age group affected was 51-60 years. Microbiological profile of CAP varies geographically. There is a need to conduct regular prevalence and antibiogram studies to develop empirical guidelines for treatment of CAP in that particular region.

Conflict of interest: None

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