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Clinical Analysis of Community Acquired Pneumonia and Hospitalization Outcome

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Abstract
Background: *Community acquired pneumonia is one of the major health problem in India. Early diagnosis of patients with CAP and appropriate treatment are important features with impact on overall mortality.*
Aims and Objectives: *To study the causes and clinical profile of community acquired pneumonia and to analyse the factors that contribute to clinical outcome of such patients.*
Methods: *This is a cross sectional study conducted at Sri Ramachandra Medical college and research institute. Cases are collected from the department of general medicine between april 2014 and april 2015. All patients presenting with symptoms of an acute lower respiratory tract illness (cough and at least one other lower respiratory tract symptom) were included in the study. A basic laboratory workup along with Chest X ray was done in all patients. Culture of sputum, blood, urine and trachea was done.*
Results: *A total of 216 consecutive patients with community acquired pneumonia (CAP) were studied. The most common presenting symptom in our study is cough 97.4% (n=210), followed by expectoration 75%(n=162), 70.4% (n=152) had fever, 33.3% (n=72) of patients had breathlessness. Among the comorbid conditions diabetes mellitus (33.7%; n=73) and hypertension (32.4%; n=70) were common. Viral etiology is much more common (proven H1 N1positive were 28%) than bacterial etiology. 75.4% (n=32) of patients of the patients had no complications. Pleural effusion was seen in 14.8% (n=32) of patients, ARDS in 7.4% (n=16) of patients. Commonest bacterial organisms found were Streptococcous pneumoniae 23.0% (n=3) and Klebsiella pneumoniae 23.0% (n=3), followed by Staphylococcous aureus 15.3% (n=2) and E.coli 15.3% (n=2). Mortality seen in this study was 4.5% (n=10) among which 6 deaths were noted in patients diagnosed to have H1N1 positive status.*
Conclusion: *Community acquired pneumonia is common among young and middle aged males. Most common presenting feature is cough (97.4%) followed by expectoration (75%) and fever (70.4%). Viral etiology is much more common (proven H1 N1positive were 28%) than bacterial etiology. Most common complication noted was pleural effusion (14.8%). Mortality is noted more in patients aged more than 60 years of age, contributes to 50% of overall mortality.*
Keywords: *Community acquired pneumonia, H1N1, Klebsiella, Pleural effusion, Steptococcu.*

Introduction

Community acquired pneumonia is a major health problem in India. Pneumonia is a acute illness of the respiratory system with new long shadows on a Chest X-ray which can be multilobar or segmental. Lobar pneumonia refers to homogeneous involvement of lung lobes associated with pleural inflammation. Bronchopneumonia refers to patchy consolidation with involvement of predominantly lower lobes.

Pneumonia can be divided into 4 categories based on the site of acquisition of illness: Community acquired pneumonia (CAP), hospital-acquired pneumonia (HAP), ventilator-associated pneumonia (VAP), and health care-associated pneumonia (HCAP).

Prognostic tools like pneumonia severity index (PSI), CURB-65 have been validated in several studies and used to aid in diagnosis.[1,2]

PSI stratifies patient into 5 categories on the basis of mortality risk. patients in group 1 and 2 treated as outpatients. Group 3 patients treated in observation unit, group 4 admitted to hospital. CURB -65 scoring comprises of confusion, increased urea, increased respiratory rate, low blood pressure and age more than 65. Patients with CURB -65 scoring of more than 2 can be treated as in- patient,. CURB -65 scoring more than 3 will require icu admission.

Materials and Methods

The following study is a cross sectional study conducted at Sri Ramachandra medical college and research institute. Cases are collected from the department of general medicine between april 2014 and april 2015. All patients presenting with symptoms of an acute lower respiratory tract illness (cough and at least one other lower respiratory tract symptom) were included in the study. Patients with features of health care associated pneumonia, hospitalization in an acute care hospital for two or more days in the last 90 days, residence in a nursing home or long-term care facility in the last 30 days, receiving outpatient intravenous therapy (like antibiotics or chemotherapy) within the past 30 days, receiving home wound care within the past 30 days and attending a hospital clinic or dialysis center in the last 30 days were excluded from the study. A basic laboratory workup along with Chest X ray was done in all patients. Culture of sputum, blood, urine and trachea was done. Specific imaging and other investigation modalities were done when required. Patient details were collected in a Proforma as is enclosed.

The results of the study were analysed and statistical data was summarised using SPSS for windows, version 16.0, Chicago Inc. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples for Independent groups the Unpaired sample t-test was used. To assess the relationship between the variables Spearman's rank Correlation was used. To find the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value 0.05 is considered as significant level**.**

Results

A total of 216 consecutive patients with community acquired pneumonia (CAP) were studied. Incidence of community acquired pneumonia is noted highest in the age group of 21-40 years 39.3% (n=85), followed by the age group of 40-60 years 34.2% (n=74), 21.7% (n=47) in the age group of >60 years and 4.6% (n=10) in the age group 18-20 years. Our study shows higher incidence of community acquired pneumonia in males compared to females. 57% (n=123) were males and 43% (n=93) were females. The most common presenting symptom in our study is cough 97.4% (n=210), followed by expectoration 75% (n=162), 70.4% (n=152) had fever, 33.3% (n=72) of patients had breathlessness and atypical symptoms such as cough, vomiting were noted in 11.6% (n=25) of patients. Patients with hemoptysis and asymptomatic presentations

were rare. Hemoptysis was seen in 1.4% (n=3) and asymptomatic patients were 1.4% (n=3) . 40% of patients who had community acquired pneumonia were without any comorbid conditions. Among the comorbid conditions diabetes mellitus (33.7%; n=73) and hypertension (32.4%; n=70) were common. Other common predisposing conditions associated with community acquired pneumonia were bronchial asthma (11.1%; n-24) and preexisting heart disease (11.5%; n=25) along with thyroid disorder (5.0%;n=11), TB (4.6%; n=10), COPD (4.6%; n=10), CNS involvement (3.2%; n=7). Etiological diagnosis was made in 34.7% (n=75), of which positive cultures were made only in 6.0% (n=13).

Prognosis

CURB SCORE	FREQUENCY	PERCENT	VALID PERCENT	CUMMULATIVE PERCENT
0	153	70.8	70.8	70.8
1	40	18.5	18.5	89.3
2	14	6.4	6.4	95.7
3	7	3.2	3.2	98.9
4	2	0.9	0.9	100

CURB 65 Score of 0 was noted in majority of patients 70.8% (n=153). A score of one was noted in 18.5%; n=40, score of 2 was noted in 6.2%; n=14, a score of 3 in 3.2%;n=7, a score of 4 in 0.9%;n=2

75.4% (n=32) of patients of the patients had no complications. Pleural effusion was seen in 14.8% (n=32) of patients, ARDS in 7.4% (n=16) of patients, atrial fibrillation was observed in 1.3 (n=3) of patients, SIADH was observed in 0.4% (n=1) of patients, empyema is noted in 0.4% (n=1) of patients.

Blood culture, sputum culture, BAL culture, Non BAL culture showed no growth in majority of patients 92.5% (n=200). Commonest bacterial organisms found were Streptococcous pneumoniae 23.0% (n=3) and Klebsiella pneumoniae 23.0% (n=3), followed by Staphylococcous aureus 15.3% (n=2) and E.coli 15.3% (n=2). H1 N1 was positive in 28.7% (n=62). This is attributable to the epidemic of H1N1 Influenza during the study period. Incidence of mortality was less even in patients with complications. Mortality seen in this study was 4.5% (n=10) among which 6 deaths were noted in patients diagnosed to have H1N1 positive status. Mortality among the non H1 N1 community acquired pneumonia was 4/155. The incidence of mortality was noted highest in patients with age more than 60 years of age.

Discussion

Community acquired pneumonia is one of the leading cause of morbidity and mortality in developing nations like india. In our study we found that the Incidence of community acquired pneumonia is noted highest in the age group of 21-40 years 39.3% (n=85). A similar Study conducted in Japan by Morimoto et al,[3] among the aging Japanese population showed a sharp rise in incidence associated with age, where the incidence in patients with age more than 85 years is 10 times higher than in patients in the age group of 15-64 years.[3] Our study shows that there is 1.32 times higher incidence of community acquired pneumonia in males than in females. On analyzing the study conducted by Almiral J, Bolibar I,[4] et al, it is noted that this ratio of male to female is 1.4:1 with male preponderance. In our study Commonest bacterial organisms found were Streptococcous pneumoniae 23.0% (n=3) and Klebsiella pneumoniae 23.0% (n=3). Staphylococcous aureus 15.3% (n=2), E.coli 15.3% (n=2), H1 N1 was positive in 28.7% (n=62). In a Korean study conducted by Ji Eun Kim et al[5] suggests that viral etiology should be considered when the patient has symptoms of rhinorrhoea and ground glass opacities in chest

xray. And these patients could be started on empirical antivirals. In a study which was conducted in Delhi by Chaudhry R, Kumar P et al[6], among 42 cases highest incidence was Mycoplasma pneumonia (24%) followed by other gram negative bacilli (19%) and Klebsiella pnemoniae (17%). In a study which was conducted in Shimla by Bansal S, Kashyap S, Pal LS et al[7], 70 patients were analysed and the commonest organism noted was streptococcous pneumoniae (27%) followed by klebsiella pneumoniae (17%). In a study which was conducted in Ludhiana by Oberoi A, Aggarwal A[8], 233 patients were analysed. The commonest organism noted was Chlamydia pneumoniae (18%) followed by mycoplama pneumonaie (16%). In a study which was conducted in Chennai by Shankar EM, Kumarasamy N, Vignesh R et al[9], the commonest organism seen was Klebsiella (15%) followed by Staphylococcus (8%). In a study which was conducted in Vellore by Song JH, Oh WS, Kang CI et al,[10] between 2002-2004, commonest organism seen was Streptococcous pneumoniae (10%) followed by Klebsiella (8%) A multicenter study which was conducted in Japan by Saito A, Kohno S, Matsushima T et al,[11] between 1999- 2000, showed streptococcus pneumonia as the commonest agent (25%) followed by Klebsiella pneumoniae (19%). In a study which was conducted in Norway by Jan C Holter, Fredrik Müller, Ola Bjørang et al,[12] between 2008- 2011 showed streptococcus pneumonia as the commonest organism (81%).

In patients with non H1 N1 community acquired pneumonia, combination therapy of beta lactam antibiotics (third generation cephalosporin or piperacillin tazobactam commonly) with a macrolide is a commonly used (96.1%) n=149. 6 patients were treated as mono therapy – 3.8%. Rationale for using Azithromycin as an empirical therapy for community acquired pneumonia is that it gives a higher cure rate. In a study conducted by George et al[13] shows cure rate of 89.4% for community acquired pneumonia secondary to azithromycin sensitive streptococcous pneumoniae. In Azithromycin resistant pneumococcal infection when azithromycin is used its cure rate is only 28.9%. Several studies were conducted with regard to beta lactam and macrolide combination therapy and beta lactam monotherapy. These studies shows that beta lactam and macrolide combination therapy is superior in terms of reducing mortality secondary to community acquired pneumonia[14]. Study conducted by Alexandra Kovaleva et al [15] shows that Macrolides when combined with beta lactam antibiotics not only provides antibiotic effect but they also provides immune modulatory effect by reducing cytokine secretion and cell activation

Conclusion

Community acquired pneumonia is common among young and middle aged males. Most common presenting feature is cough (97.4%) followed by expectoration (75%) and fever (70.4%). Etiological diagnosis is possible only in 34.7% of patients. Among which positive cultures were noted only in 6% of patients. Viral etiology is much more common (proven H1 N1positive were 28%) than bacterial etiology. Blood culture, sputum culture, BAL and Non BAL culture though very useful in assessing the etiological agent, yield of culture is poor. Most common complication noted was pleural effusion (14.8%). Mortality is noted more in patients aged more than 60 years of age, contributes to 50% of overall mortality.

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